



## **Business Strategy and Corporate Environmental Responsibility**

by

Maria P. Boura

Dissertation submitted in partial fulfillment of the requirements for the  
degree of Doctor of Philosophy  
in the Department of Management Science and Technology of  
the Athens University of Economics and Business

Supervised by Professor Spyros Lioukas

Athens University of Economics and Business  
January 2017



## Acknowledgements

By completing my PhD thesis I would like to express my greatest gratitude to my supervisor, Professor Spyros Lioukas. I consider myself blessed for meeting not only a unique academic but a one of a kind person that was always willing to help, encourage and teach me being a better researcher and most important a better person. I will always be grateful to him for teaching me what Aristotle told “Educating the mind without educating the heart is no education at all”. I hope the meaning of this quotation will guide my life forever.

My special thanks go to the members of my supervision committee, Dr Stelios Zyglidopoulos, Reader in Management at University of Glasgow and Associate Professor Irini Voudouris. They have both been extremely helpful and inspiring not only as academics but as people as well.

I would like to express my deepest appreciation to Dr Dimitris Tsouknidis, Lecturer at the Department of Commerce, Finance and Shipping at Cyprus University of Technology, for the priceless contribution of his numerous skills and knowledge in the course of my PhD.

I would also like to thank my colleagues and friends that have been sharing my concerns; Dr G. Papagiannakis, Dr M. Papazoglou, Dr Y. Sapouna, Dr E. Chatzopoulou, Dr I. Deligianni, M. Sofikitis, Dr G. Angelopoulos, Dr A. Sakkas, M. Kechagia, N. Galanou, A. Eleftheriou, E. Rapti and E. Tseliou.

I am greatly thankful to my special friend, Dr Maria Fotaki for our constructive discussions on research and her continuous ethical support on several issues that came up during the last year of my doctoral studies.

During these years, I was lucky to meet several academics that they have been willing to share my considerations with them and made me admire the area of research and teaching; Professor A. Philippopoulos, Y. Spanos, S. Blavoukos, D. Bourantas, D. Bourantonis, C. Caramanis, J. Chalikias, P. Dellaportas, P. Fleming, G. Lekakos, N. Papalexandris, A. Pliakos, C. Tarantilis and A. Xepapadeas.

A next word of gratitude goes to my close people and friends for always being there for me, supporting and encouraging me; Marios Fragkoulis, Katerina Christopoulou, Vasso Tsovola, Thalia Kaitantzidou, Ilia Daifa, Elina Vasilopoulou, Charoula Alexandri, Konstantina Liakopoulou, Penny Makrygianni and Maria Theologou.

Last, I would like to express my love and gratitude to my family and especially to my sister Alexandra Boura who has always been my role model.



## Εκτενής Περίληψη

Η παρούσα διδακτορική διατριβή εστιάζει στην περιβαλλοντική διάσταση της εταιρικής κοινωνικής υπευθυνότητας. Δεν είναι λίγες οι έρευνες που έχουν πραγματευτεί ζητήματα περιβαλλοντικής στρατηγικής των επιχειρήσεων. Ωστόσο, οι περισσότερες από αυτές έχουν επικεντρωθεί στα αποτελέσματα που επιφέρει στην επιχείρηση και όχι τόσο στους προσδιοριστικούς της παράγοντες. Ακριβώς όμως λόγω της πληθώρας ερευνών, τόσο σε ακαδημαϊκό όσο και επιχειρηματικό επίπεδο, των ευεργετικών για την επιχείρηση αποτελεσμάτων που επιφέρει η εφαρμογή περιβαλλοντικών πρακτικών, όπως βελτίωση εταιρικής εικόνας, νομιμοποίηση στο επιχειρηματικό περιβάλλον, εξοικονόμηση ενέργειας και πρώτων υλών και συνεπώς αύξηση της κερδοφορίας της, η εξέταση των παραγόντων που προσδιορίζουν και οδηγούν μια επιχείρηση στο να διαμορφώσουν την περιβαλλοντική της απόδοση κρίνεται εξαιρετικά ενδιαφέρουσα.

Τα επιχειρήματα που έχουν ήδη διαμορφωθεί στη βιβλιογραφία σχετικά με τους λόγους που οι επιχειρήσεις προβαίνουν σε περιβαλλοντικές πρακτικές είναι ποικίλα και συχνά αντικρουόμενα. Αφενός, υπάρχει η πιο «ευαισθητοποιημένη» επιχειρηματολογία, στην οποία τίθεται ζήτημα αξιών που χαρακτηρίζουν τους ηγέτες ή και ακόμα τους υπαλλήλους των επιχειρήσεων και τους οδηγούν σε σχεδιασμό στρατηγικής με γνώμονα την προστασία του περιβάλλοντος. Αφετέρου η επιχειρηματολογία κλιμακώνεται σε λιγότερο «ευαισθητοποιημένη», με τις επιχειρήσεις να καλούνται να συμμορφωθούν τόσο με τους ισχύοντες νόμους που προστάζουν συγκεκριμένες περιβαλλοντικές σταθερές στη λειτουργία τους, όσο και με το γενικότερο ανταγωνιστικό επιχειρηματικό περιβάλλον που ολοένα και αυξάνει την περιβαλλοντικές του πρακτικές, αλλά και με την επιταγή της ικανοποίησης των ενδιαφερόμενων ομάδων και κυρίως των καταναλωτών/πελατών οι οποίοι δείχνουν συχνά να στρέφονται στις ευαισθητοποιημένες περιβαλλοντικά επιχειρήσεις ή/και στα πράσινα προϊόντα. Στο τέλος της κλιμάκωσης της επιχειρηματολογίας για τους παράγοντες της εταιρικής περιβαλλοντικής στρατηγικής, έρχεται η πιο «κυνική» ή ορθολογιστική προσέγγιση που αναφέρει ότι οι επιχειρήσεις δεν παρακινούνται από καμία υποχρέωση για την

εφαρμογή της εταιρικής κοινωνικής ευθύνης παρά μόνο εάν εξυπηρετεί την κερδοφορία τους, δεδομένου όμως ότι δρουν μέσα σε ένα νόμιμο και ηθικό πλαίσιο.

Με την ανασκόπηση τέτοιων αντικρουόμενων επιχειρημάτων σχετικά με την περιβαλλοντική στρατηγική των επιχειρήσεων που εκθέτουν τόσο κίνητρα αξιών όσο και οφέλους, αντιλαμβάνεται κανείς την περιπλοκότητα της αλλά και τη σημαντικότητα των αποτελεσμάτων της. Για το λόγο αυτό, η παρούσα διδακτορική έρευνα ασχολήθηκε με τους προσδιοριστικούς παράγοντες δύο πτυχών της περιβαλλοντικής στρατηγικής των επιχειρήσεων. Πρώτον, αυτή της εταιρικής δημοσιοποίησης περιβαλλοντικών στοιχείων (environmental disclosure), που αντιπροσωπεύει τις περιβαλλοντικές πρακτικές που κοινοποιούν ότι ασκούν και δεύτερον αυτή της εταιρικής περιβαλλοντικής επίδοσης που αντιπροσωπεύει τις περιβαλλοντικές πρακτικές (environmental performance) που ασκούν.

**Το πρώτο κεφάλαιο** της παρούσας διδακτορικής διατριβής εξετάζει τους προσδιοριστικούς παράγοντες της περιβαλλοντικής δημοσιοποίησης (environmental disclosure). Η δημοσιοποίηση περιβαλλοντικών πρακτικών είναι ένα ζήτημα που απασχόλησε πιο πρόσφατα την έρευνα και πιθανώς ήταν επακόλουθο της κοινής τακτικής των επιχειρήσεων να κοινοποιούν στις ενδιαφερόμενες ομάδες οικονομικά στοιχεία τους, ειδικότερα έπειτα από σκάνδαλα που απασχόλησαν την κοινή γνώμη, όπως οι περιπτώσεις WorldCom, Enron, και Parmalat. Παρομοίως, οι κλιματικές και ενεργειακές νομοθετικές διατάξεις που έχει επιβάλλει η συντριπτική πλειοψηφία των χωρών (64 από τις 66 χώρες που ευθύνονται για το 88% της παγκόσμιας μόλυνσης του περιβάλλοντος σύμφωνα με το Globe International (2014)), αλλά και η πρόσφατη Οδηγία του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου για τη δημοσιοποίηση μη χρηματοοικονομικών πληροφοριών (EU Directive, 2014), καταδεικνύουν την επιτακτική ανάγκη για διαφάνεια σε ζητήματα περιβαλλοντικών πρακτικών.

Η επιστημονική έρευνα σχετικά με την περιβαλλοντική δημοσιοποίηση, έχει επικεντρωθεί κυρίως στη σημαντικότητά της και στην επίδρασή της στην εταιρική εικόνα της, στη νομιμοποίησή της απέναντι στις ενδιαφερόμενες ομάδες και κυρίως στους

πελάτες και κατά συνέπεια στην κερδοφορία της. Η εμπειρική έρευνα, περιορίζεται σε ποσοτική ανάλυση πρωτογενών δεδομένων από ερωτηματολόγια ή σε ποιοτική ανάλυση των εταιρικών ιστοσελίδων και ετήσιων εκθέσεων, ελέγχοντας την περιβαλλοντική δημοσιοποίηση των επιχειρήσεων σε εύρος ενός ή περιορισμένων ετών. Επίσης, δεν ελέγχεται η επίδραση της χώρας στην οποία λειτουργεί η επιχείρηση, δεδομένου του ότι η νομοθεσία, οι αξίες και η κουλτούρα της κάθε χώρας ενδέχεται να επηρεάζουν τα αποτελέσματα.

Δεδομένης της μελέτης της σχετικής βιβλιογραφίας, καθώς και της σημαντικότητας της περιβαλλοντικής δημοσιοποίησης ως καθοριστική πρακτική στη στρατηγική ατζέντα, η παρούσα διδακτορική διατριβή έρχεται στο πρώτο της κεφάλαιο να καλύψει ορισμένα αναπάντητα ερωτήματα σε σχέση με τους προσδιοριστικούς της παράγοντες. Η πρώτη υπόθεση που γίνεται αφορά στην επίδραση της κοινωνικής φήμης της επιχείρησης στη δημοσιοποίηση περιβαλλοντικών πρακτικών. Το πρώτο κεφάλαιο έρχεται να αναδείξει το μηχανισμό κατά τον οποίο η κοινωνική φήμη που έχει αναπτύξει η επιχείρηση επιδρά θετικά στη μελλοντική δημοσιοποίηση περισσότερων στοιχείων σχετικά με τις περιβαλλοντικές της πρακτικές.

Το θεωρητικό υπόβαθρο του πρώτου κεφαλαίου αναφέρεται αρχικώς στη θεωρία σηματοδότησης (signaling theory), σύμφωνα με την οποία μία επιχείρηση προβάλλει πληροφορίες στα ενδιαφερόμενα μέρη που αφορούν στον εταιρικό «χαρακτήρα» της, τις ικανότητες και τις πρακτικές της δημιουργώντας απέναντί της θετικά προσκείμενη συμπεριφορά. Η θεωρία του σήματος συνδυάζεται με τη θεωρία των ενδιαφερόμενων μερών (stakeholder theory) και πιο συγκεκριμένα με την instrumental stakeholder theory. Σύμφωνα με την τελευταία, οι επιχειρήσεις, οφείλουν να αποφεύγουν πολιτικές και σχέσεις με τις ενδιαφερόμενες ομάδες που χαρακτηρίζονται από την καιροσκοπία. Μια τέτοια νοοτροπία, ενδέχεται σε πρώτη ανάγνωση να δίνει την εντύπωση αμιγώς αλτρουιστικών κινήτρων των επιχειρήσεων που αναστέλλουν τη βέλτιστη οικονομική απόδοση. Ωστόσο, η έννοια της θεωρίας αυτής έρχεται να εξηγήσει ότι οι συμπεριφορές

μίας επιχείρησης που είναι απαλλαγμένες από καιροσκοπία και οι συνεπείς σχέσεις με τα ενδιαφερόμενα μέρη συμβαδίζουν με την κερδοφορία της.

Συνεπώς, το πρώτο κεφάλαιο, έρχεται να εξηγήσει το μηχανισμό λειτουργίας των δύο εκ των τριών πυλώνων της εταιρικής βιωσιμότητας, του κοινωνικού «αποθέματος», έτσι όπως «αντανακλάται» από την κοινωνική φήμη και της περιβαλλοντικής επίδοσης των επιχειρήσεων, όπως εκδηλώνεται μέσω της δημοσιοποίησης περιβαλλοντικών δράσεων: Η επιχείρηση, αντιλαμβάνεται την υψηλή κοινωνική της φήμη ως προνόμιο του κοινωνικού της χαρακτήρα που την παροτρύνει, λόγω των άτυπων «κοινωνικών συμβολαίων» που έχει συνάψει με τις ενδιαφερόμενες ομάδες και της συνέπειας με την οποία οφείλει να συνεχίσει να δρα (instrumental stakeholder theory), να επεκτείνεται σε περιβαλλοντικές δράσεις και να αναπαράγει σήματα και πληροφορίες για την περιβαλλοντική της συμπεριφορά μέσω της δημοσιοποίησης (signaling theory). Συνεπώς, τα αποτελέσματα του πρώτου κεφαλαίου επιβεβαιώνουν ότι ο κοινωνικός πυλώνας επεκτείνεται στην ανάπτυξη του περιβαλλοντικού, εξηγώντας δηλαδή τον μηχανισμό με τον οποίο οι επιχειρήσεις οδηγούνται στον οικονομικό πυλώνα, βαδίζοντας στο δρόμο της εταιρικής βιωσιμότητας.

**Το δεύτερο και τρίτο κεφάλαιο** ερευνά τη λειτουργία και επίδραση μηχανισμών με τους οποίους οι επιχειρήσεις επιλέγουν στο πλαίσιο της ευρύτερης στρατηγικής τους να διαμορφώσουν την περιβαλλοντική τους επίδοση. Το ερευνητικό πεδίο σχετικά με τους προσδιοριστικούς παράγοντες των περιβαλλοντικών επιδόσεων των επιχειρήσεων είναι εξαιρετικά ευρύ αλλά κυρίως εξετάζει την περιβαλλοντική επίδοση των επιχειρήσεων ως μεμονωμένη πρακτική που λαμβάνει χώρα για λόγους αξιών, ανάγκης συμμόρφωσης στις σχετικές νομοθετικές ρυθμίσεις και σε νομιμοποιημένες πρακτικές και φυσικά για λόγους ανταγωνιστικότητας και κερδοφορίας της επιχείρησης. Ωστόσο, δεν είναι ξεκάθαρο το πώς λαμβάνονται οι επιχειρηματικές αποφάσεις σχετικά με την ανάληψη περιβαλλοντικών πρακτικών, που γίνονται αντιληπτές ως μια διάσταση άρρηκτα ενταγμένη στο γενικό πλαίσιο της επιχειρησιακής στρατηγικής. Συγκεκριμένα, το δεύτερο και τρίτο κεφάλαιο αναδεικνύει ότι οι επιχειρήσεις δεν προσδιορίζουν τις

περιβαλλοντικές τους πρακτικές σε αυτόνομο επίπεδο, αλλά τις διαμορφώνουν και αναδιαμορφώνουν βάσει της γενικής στρατηγικής που ακολουθούν έχοντας ως σημείο αναφοράς τη στρατηγική των ανταγωνιστών τους.

Όσον αφορά στο θεωρητικό πλαίσιο, σύμφωνα με τη θεσμική θεώρηση (institutional theory) οι επιχειρήσεις οφείλουν να υιοθετούν τις πρακτικές των ανταγωνιστών τους είτε γιατί θεωρούνται νομιμοποιημένες ή υποχρεωτικές στον κλάδο τους (κανονιστική ή καταναγκαστική μίμηση) είτε γιατί προσπαθούν να μιμηθούν τους πιο επιτυχημένους τους ανταγωνιστές (μιμητική ή ανταγωνιστική ισομορφία).

Αντίστοιχα, σύμφωνα με τις γενικές αρχές ανταγωνιστικής στρατηγικής η αναζήτηση καλών πρακτικών πρέπει να γίνεται από τις επιχειρήσεις ανάμεσα στις επιχειρήσεις-ηγέτες της ίδιας στρατηγικής ομάδας (στρατηγική κόστους ή στρατηγική διαφοροποίησης). Συνεπώς, οι ηγέτες μίας στρατηγικής είναι το σημείο αναφοράς που οι επιχειρήσεις παρακολουθούν και αναλύουν, σε αναζήτηση καλών πρακτικών.

**Το δεύτερο κεφάλαιο** της παρούσας διδακτορικής διατριβής αναδεικνύει τον μηχανισμό μίμησης που ασκεί η επιχείρηση βάσει των γενικών αρχών ανταγωνιστικής στρατηγικής κατά τον οποίο όσο μεγαλύτερη είναι η απόσταση των περιβαλλοντικών της πρακτικών από την επιχείρηση-ηγέτη στην αντίστοιχη με αυτή στρατηγική ομάδα, τόσο μεγαλύτερη θα είναι η μελλοντική της περιβαλλοντική επίδοση. Με άλλα λόγια, όταν η επιχείρηση, στο πλαίσιο της ανάλυσης των διαστάσεων της στρατηγικής τους, ανακαλύπτει ότι υπολείπεται της περιβαλλοντικής επίδοσης των επιχειρήσεων-ηγετών προσπαθούν να τη μιμηθούν. Συνεπώς η επιχείρηση δεν αναζητά τις βέλτιστες περιβαλλοντικές πρακτικές στην επιχείρηση με τις καλύτερες περιβαλλοντικές επιδόσεις αλλά στην επιχείρηση με την καλύτερη γενική στρατηγική που αντιστοιχεί στη στρατηγική της ομάδα, προκειμένου να ανταπεξέλθουν του ανταγωνισμού. Η μίμηση αυτή των περιβαλλοντικών πρακτικών μπορεί να γίνει είτε σε όρους γενικών περιβαλλοντικών πρακτικών είτε με την εφαρμογή περιβαλλοντικών πρακτικών σχετικών με τη στρατηγική που ακολουθούν.

Στην περίπτωση των επιχειρήσεων που ακολουθούν τη στρατηγική κόστους οι επιχειρήσεις που υπολείπονται σε περιβαλλοντικές πρακτικές έναντι της επιχείρησης-ηγέτη στρατηγικής κόστους προβαίνουν σε αύξηση των περιβαλλοντικών τους πρακτικών, οι οποίες μπορεί να είναι γενικές ή να αφορούν σε πρακτικές που αντιπροσωπεύουν τη στρατηγική που ακολουθούν όπως μείωση πόρων, ρύπων, εξοικονόμηση ενέργειας ή πρώτων υλών. Αντίστοιχα, στην περίπτωση των επιχειρήσεων που ακολουθούν την ηγεσία στρατηγικής διαφοροποίησης οι επιχειρήσεις στη διαπίστωση ότι η επιχείρηση-ηγέτης στρατηγικής διαφοροποίησης έχει καλύτερη περιβαλλοντική επίδοση, αντιδρά με την αύξηση των περιβαλλοντικών πρακτικών που ενδεχομένως να αφορούν σε πρακτικές όπως παραγωγή πράσινων προϊόντων, εφαρμογή περιβαλλοντικών καινοτομιών, έρευνας και ανάπτυξης σε περιβαλλοντικά ζητήματα κ.α. Στην περίπτωση των επιχειρήσεων που ακολουθούν τη στρατηγική κόστους, αυτές διακρίθηκαν από το συνολικό δείγμα των επιχειρήσεων, βάσει του δείκτη του κόστους πωληθέντων/πωλήσεις και για τις επιχειρήσεις που ανήκουν στη στρατηγική διαφοροποίησης, χρησιμοποιήθηκαν δύο δείκτες, ο δείκτης για την καινοτομία όπως αντανακλάται από το δείκτη του κόστους για έρευνα και ανάπτυξη/πωλήσεις καθώς και ο δείκτης του κόστους για μάρκετινγκ/πωλήσεις. Πράγματι, τα αποτελέσματα των υποθέσεων επιβεβαίωσαν ότι στην περίπτωση της στρατηγικής κόστους αλλά και της στρατηγικής διαφοροποίησης σε πρακτικές μάρκετινγκ, ο μηχανισμός μίμησης των περιβαλλοντικών πρακτικών της επιχείρησης-στρατηγικού ηγέτη ισχύει, αναδεικνύοντας ότι η περιβαλλοντική επίδοση επηρεάζεται άμεσα από τη μιμητική διαδικασία όχι καθαυτής της περιβαλλοντικής πολιτικής αλλά της γενικής στρατηγικής που ακολουθούν οι επιχειρήσεις. Ωστόσο, στην περίπτωση της στρατηγικής διαφοροποίησης σε καινοτομία όπως αντανακλάται από την έρευνα και ανάπτυξη, τα αποτελέσματα δεν υπέδειξαν ότι λειτουργεί ο μηχανισμός κατά τον οποίο οι επιχειρήσεις μιμούνται τον εν λόγω στρατηγικό ηγέτη.

Ωστόσο, το αποτέλεσμα αυτό δεν είναι παράδοξο. Οι πρακτικές για έρευνα και ανάπτυξη έχουν ορισμένα χαρακτηριστικά που αποτρέπουν τη μίμηση τους από τους ανταγωνιστές, όπως το ότι συνήθως προστατεύεται η πνευματική τους ιδιοκτησία (π.χ.



πατέντες), αλλά και η εκτέλεσή τους σε διάφορα στάδια που καθιστούν πιο περίπλοκη τη δυνατότητα από τους ανταγωνιστές να τα αποκωδικοποιήσουν. Η δυσκολία αυτή είναι αναμενόμενο να προκύπτει καθώς πρακτικές που ενέχουν πολυπλοκότητας ή/ και εμπλέκουν τεχνολογικές πατέντες, αποτελούν από τις επιχειρήσεις - πρωτοπόρους μία εξαιρετική ευκαιρία να διατηρήσουν το ανταγωνιστικό τους πλεονέκτημα υψώνοντας νομικούς φραγμούς και διαδικαστικά εμπόδια. Συνεπώς, η διαδικασία μίμησης πρακτικών έρευνας και ανάπτυξης λαμβάνει χώρα κάτω από περίπλοκες συνθήκες που καθιστούν δύσκολο να εκτελεστεί αποτελεσματικά και δύνανται να αποθαρρύνουν τους ανταγωνιστές να την επιχειρήσουν, λόγω της αβεβαιότητας των αποτελεσμάτων και των αποδόσεων της. Η μίμηση των πρακτικών έρευνας και ανάπτυξης εμποδίζεται από συνδυαστικούς μηχανισμούς που περιλαμβάνουν τη δυσκολία αυτών καθαυτών των πρακτικών έρευνας και ανάπτυξης να αναπαραχθούν καθώς και το κόστος και τους πόρους που απαιτούνται για την αναπαραγωγή τους. Ακόμα, το συνεχές «κυνήγι» της ταχείας εξέλιξης της τεχνολογίας δίνει το πλεονέκτημα στους πρωτοπόρους να επικαιροποιούν τις πρακτικές τους σε έρευνα και ανάπτυξη πριν καν προλάβουν οι ανταγωνιστές τους να αποκωδικοποιήσουν τις προηγούμενες. Τέλος, στα παραπάνω έρχεται να προστεθεί η αβεβαιότητα των αποδόσεων των επενδύσεων σε έρευνα και ανάπτυξη που οφείλεται σε ορισμένα προνόμια που απολαμβάνουν οι πρωτοπόροι, όπως η αφοσίωση των ενδιαφερόμενων ομάδων σε ήδη καθιερωμένα εμπορικά σήματα.

**Το τρίτο κεφάλαιο** κινείται σε παρόμοια προσέγγιση. Δεδομένου του ότι ο ηγέτης μίας στρατηγικής δεν ηγείται πάντα και σε επίπεδο περιβαλλοντικής επίδοσης, σε αυτό το κεφάλαιο εξετάζεται η επίδραση στην περιβαλλοντική επίδοση μίας επιχείρησης όταν διαπιστώνει μέσω της παρακολούθησης και ανάλυσης των ανταγωνιστών ότι εκείνη σημειώνει καλύτερη περιβαλλοντική επίδοση από την επιχείρηση-στρατηγικό ηγέτη. Ποια είναι η αντίδρασή της; Επαναπαύεται στη διατήρηση των τρεχουσών περιβαλλοντικών της πρακτικών; Συμβιβάζεται ως έχει, ανατρέχοντας σε άλλες διαστάσεις της στρατηγικής των ανταγωνιστών της σε αναζήτηση πρακτικών που υπολείπεται ώστε να τις μιμηθεί; Ή ανακαλύπτει το ανταγωνιστικό της πλεονέκτημα στο οποίο θα πρέπει να επενδύσει και να ενισχύσει περαιτέρω;



Το τρίτο κεφάλαιο εξετάζει την επίδραση των προδραστικών (proactive) περιβαλλοντικών στρατηγικών των επιχειρήσεων έναντι των δυνάμεων μίμησης και ισομορφίας. Υποστηρίζει ότι στην περίπτωση που μία επιχείρηση διαπιστώνει, στο πλαίσιο παρακολούθησης της επιχείρησης-στρατηγικού ηγέτη, ότι υπερτερεί αυτού σε επίπεδο περιβαλλοντικής επίδοσης, όχι μόνο αυτή η διαπίστωση δεν λειτουργεί καθυστερητικά αλλά ενεργοποιεί την επιχείρηση να βελτιώσει ακόμα περισσότερο τις περιβαλλοντικές της πρακτικές, ενισχύοντας το περιβαλλοντικό της προβάδισμα και να λαμβάνει νέες περιβαλλοντικές πρωτοβουλίες, επενδύοντας στο ανταγωνιστικό πλεονέκτημα που έχει εντοπίσει και που ενδεχομένως είναι μέρος των αξιών της. Με άλλα λόγια, εξετάζονται επιχειρήσεις που αντιλαμβάνονται ότι έχουν ένα ουσιαστικό ανταγωνιστικό πλεονέκτημα στην περιβαλλοντική επίδοση, μέσω της παρακολούθησης και ανάλυσης του στρατηγικού ηγέτη, υπεισέρχονται πιο βαθιά στο θέμα της περιβαλλοντικής βιωσιμότητας, αναζητώντας καινοτομίες και οφέλη από το προβάδισμα σε περιβαλλοντικές πρακτικές. Τα αποτελέσματα δείχνουν ότι για τις επιχειρήσεις αυτές υπερσχύει η προδραστική τάση και αυτοτροφοδοτείται. Οι τάσεις για μίμηση και ισομορφία φαίνεται ότι δεν επικρατούν. Σύμφωνα με τα αποτελέσματα, αυτός ο μηχανισμός λειτουργεί τόσο στην περίπτωση που οι επιχειρήσεις ακολουθούν στρατηγική κόστους όσο και στις επιχειρήσεις που ακολουθούν στρατηγική διαφοροποίησης.

Ως προς το εμπειρικό μέρος της διδακτορικής αυτής διατριβής για τα τρία μοντέλα που αναπτύχθηκαν, χρησιμοποιούνται δευτερογενή δεδομένα από τη βάση ASSET4, με ένα δείγμα 3.215 επιχειρήσεων, από 21 χώρες και για ένα εύρος 11 ετών (2002-2012) για το πρώτο κεφάλαιο και 3.221 επιχειρήσεων, από 46 χώρες και για ένα εύρος 12 ετών (2002-2013) για το δεύτερο και τρίτο κεφάλαιο (το δείγμα των επιχειρήσεων δεν αυξήθηκε σε αναμενόμενο βαθμό λόγω πολλών μη περασμένων τιμών-missing values). Τα δεδομένα της εν λόγω βάσης συλλέγονται ετησίως για κάθε επιχείρηση από εκπαιδευμένους αναλυτές χρησιμοποιώντας στοιχεία που βρίσκονται στη διάθεση του κοινού μέσω πηγών όπως ετήσιες εκθέσεις, ιστοσελίδες και δελτία τύπου και συνεπώς χαρακτηρίζονται από αντικειμενικότητα και διαφάνεια.

Δεδομένου του ότι τα δεδομένα που χρησιμοποιούνται στις αναλύσεις της παρούσας διδακτορικής διατριβής αφορούν σε επιχειρήσεις από μεγάλο εύρος χωρών και τα τρία κεφάλαια λαμβάνουν υπόψη κάποια χαρακτηριστικά σε επίπεδο χωρών όπως ο δείκτης περιβαλλοντικής επίδοσης, η εξωστρέφεια της οικονομίας, το επίπεδο διαφθοράς και νομοθεσίας, δείχνοντας έτσι την επίδραση τους στις επιχειρήσεις που λειτουργούν μέσα σε αυτές τις χώρες τόσο ως προς τη δημοσιοποίηση περιβαλλοντικών πρακτικών που πραγματεύεται το πρώτο κεφάλαιο όσο και ως προς την περιβαλλοντική επίδοση των επιχειρήσεων που μελετούν το δεύτερο και τρίτο κεφάλαιο.

Κατά συνέπεια, η παρούσα αυτή διδακτορική διατριβή έρχεται να αποσαφηνίσει κάποια αναπάντητα ζητήματα σχετικά με τους προσδιοριστικούς παράγοντες της περιβαλλοντικής στρατηγικής των επιχειρήσεων. Είναι εξαιρετικά χρήσιμο οι ρουτίνες και λειτουργίες των επιχειρήσεων να εξηγούνται όχι μεμονωμένα αλλά όπως οι λειτουργίες των ζωντανών οργανισμών που δεν γίνονται αυτόνομα αλλά στο πλαίσιο αλληλένδετων και αντανακλαστικών μηχανισμών. Τέτοιους μηχανισμούς, που εν κατακλείδι επηρεάζουν την περιβαλλοντική στρατηγική των επιχειρήσεων τόσο σε επίπεδο περιβαλλοντικής δημοσιοποίησης όσο και σε επίπεδο περιβαλλοντικής επίδοσης, έρχεται να προσδιορίσουν τα τρία επόμενα κεφάλαια.

## Extended Summary

This thesis examines the environmental dimension of corporate social responsibility in relation to aspects of corporate strategy. It deals with the determinants of two aspects of corporate environmental strategy. First, corporate environmental disclosure, representing the environmental practices that firms communicate to stakeholders. Second corporate environmental performance representing the environmental practices they actually perform.

The **first chapter** examines the effects of the firm's social orientation and of national factors on corporate environmental disclosure. Environmental disclosure is an issue which has attracted intense interest lately, probably as a sequence of the high profile scandals occupied public opinion, such as the cases of WorldCom, Enron, and Parmalat. International organizations are leading the drive for environmental responsibility, for instance the United Nations initiatives to meet the climate change challenge and the Sustainable Development Goals. The European Commission's directive on non-financial reporting obliges large enterprises to disclose their practices on social and environmental matters (EC Directive, 2013). Many enterprises undertake disclosure initiatives beyond regulations, providing signals to stakeholders and society at large about the extent to which they are responsible, in an attempt to increase social acceptance and legitimacy.

The theoretical background of this chapter draws upon signaling theory, according to which firms transmit signals and information to stakeholders, aiming at creating positive impressions for the firm. The signaling theory is combined with the stakeholder theory and more specifically with the instrumental stakeholder theory. According to the latter, firms create formal and informal relations with stakeholders which shape corporate behavior along time and are in turn mirrored in their social reputation. In this way social reputation emerges as a unique corporate characteristic which reflects the contractual relationships with stakeholders and hence disclosure of practices. Social reputation is extended to the relational contracts added along environmental issues (instrumental

stakeholder theory), reproducing signals and information about environmental behavior through disclosure (signaling theory). Along this line of reasoning, social reputation is related to corporate environmental performance, and hence environmental disclosure.

In the same chapter, certain national context factors are also examined as possible determinants of environmental disclosure of firms. These factors account for environmental policies of the country, the openness of the economy to international trade, regulatory quality and corruption levels. Firms operating in an open environment are expected to be more sensitive to international and national environmental demands, hence showing higher levels of environmental disclosure. The effects of national factors are enhanced by creating more informed and demanding stakeholders. This in turn increases a firm's environmental responses and the associated level of disclosure.

The **second and third chapters** investigate the existence of imitative mechanisms under which firms monitor their competitors and imitate the practices of the most successful competitors. This links environmental performance to the competitive strategy framework. Specifically, the second and third chapters highlight the fact that firms do not determine their environmental practices in isolation, but they shape and reshape them through a process of comparison and learning, having as a reference point the strategy of their competitors. According to institutional theory, firms adopt the practices of their competitors either because they are mandatory in their industry (regulatory or forced imitation) or because they are trying to imitate and resemble the most successful competitors (mimetic or competitive isomorphism).

In the context of the generic strategies framework, the search of best practices is directed towards the best performing competitors or the leaders within the strategic group in which a firm belongs. Therefore, strategy leaders (for cost or differentiation strategy) constitute a legitimate benchmark that companies monitor and analyze, in search of best practices. When a firm discovers that is lagging in environmental performance in comparison to the leader in its specific strategic group, it tries to imitate the leader.

The **second chapter** investigates the existence of imitative mechanism at work, for firms lagging in environmental performance. According to the general competitive strategy framework, the greater the distance of the environmental practices of a firm from the leader in its specific generic strategy group, the greater its future environmental performance. More specifically, in the low cost strategy group, firms that are exceeded in environmental practices by the cost strategy leader increase their environmental practices. For instance they are undertaking actions such as reduction of resources, pollution, energy or materials, following similar actions or the respective cost leader. Similarly, differentiation strategy firms that are exceeded in environmental performance by the differentiation strategy leader, react by increasing environmental practices that may relate to innovation practices such as production of green products, implementing environmental innovations, research and development on environmental issues etc. The goods sold/ sales ratio is used to identify firms that follow a low cost strategy. For firms following a differentiation strategy two indices were used to identify them. The R&D expenses/ sales ratio for innovative differentiation, and the marketing expenses/ sales ratio for marketing differentiation.

The **third chapter** follows a similar approach. Given that a strategic leader does not always lead in terms of environmental performance (e.g. luxury firms are not environmental leaders), this chapter examines the impact on the environmental performance of a firm when it finds through competitor monitoring that it exceeds the strategic leader in environmental performance. The chapter considers how the firm would react in this case, i.e. whether it reduces its environmental practices to the standards of the strategy leader, or maintain its environmental lead, or enhance the lead with further environmental initiatives generating an endogenous competitive advantage. This chapter argues that when a firm finds that it exceeds the strategic leader, it initiates proactive environmental strategies to further improve its competitive stance. According to the results, this mechanism works across strategies, i.e. both whether firms follow cost strategy or differentiation strategy.

Country-specific characteristics of a firm's host country, such as the environmental performance index, openness to international trade, and regulatory quality and corruption, are also considered in chapters two and three. These provide indications of significant effects in some of the cases.

Regarding the empirical part of this doctoral dissertation, secondary data is used taken from the ASSET4 database. The sample includes 3,215 firms from 21 countries and a range of 11 years (2002-2012) for the first chapter, and 3,221 firms from 46 countries and a range of 12 years (2002-2013) for the second and third chapters. Data of the Asset4 database is collected annually for each company and are characterized by objectivity and transparency. Data for national factors, notably the environmental performance index of a country, the openness of the economy, the level of corruption and legislation are taken from other sources, notably the Yale University, Thomson Reuters Eikon, and the World.

## Table of Contents

|   |    |
|---|----|
| Chapter 1: The effect of corporate social reputation and national context factors on environmental disclosure ..... | 19 |
| 1.1 Abstract .....  | 19 |
| 1.2 Introduction.....   | 20 |
| 1.3 Theoretical background and hypotheses development .....   | 25 |
| 1.3.1 Environmental disclosure and social reputation .....  | 25 |
| 1.3.2 Environmental disclosure and national context factors .....   | 29 |
| 1.4 Methods, variables and sample .....   | 33 |
| 1.4.1 Econometric model .....   | 33 |
| 1.4.2 Variables .....   | 34 |
| 1.4.3 Endogeneity issues .....  | 36 |
| 1.4.4. Data and sample .....  | 37 |
| 1.5 Results .....   | 40 |
| 1.6 Discussion and conclusion.....  | 44 |
| Chapter 2: Imitative environmental strategies: An integrated institutional-generic strategies perspective .....     | 55 |
| 2.1 Abstract .....  | 55 |
| 2.2 Introduction.....   | 56 |
| 2.3 Theoretical framework and hypotheses development.....   | 60 |
| 2.3.1 Competitive Isomorphism .....   | 60 |
| 2.3.2 Country effects .....   | 64 |
| 2.4 Methods, variables and sample .....   | 65 |

|  |     |
|--|-----|
| 2.4.1 Econometric Model .....  | 65  |
| 2.4.2 Variables .....  | 67  |
| 2.4.3 Endogeneity issues .....   | 69  |
| 2.4.4 Data and sample .....  | 70  |
| 2.5 Results .....  | 72  |
| 2.6 Discussion and conclusion.....   | 76  |
| Chapter 3: Proactive environmental strategies: An examination across generic strategy groups ..... | 95  |
| 3.1 Abstract .....   | 95  |
| 3.2 Introduction.....  | 96  |
| 3.3 Theoretical framework and hypotheses development.....  | 102 |
| 3.3.1 Proactive environmental strategies .....   | 102 |
| 3.3.2 Country effects .....  | 106 |
| 3.4 Methods, variables and sample .....  | 108 |
| 3.4.1 Econometric model .....  | 108 |
| 3.4.2 Variables .....  | 109 |
| 3.4.3 Endogeneity issues .....   | 112 |
| 3.4.4 Data and sample .....  | 112 |
| 3.5 Results .....  | 115 |
| 3.6 Discussion and conclusion.....   | 118 |
| Conclusions .....  | 133 |
| References .....   | 137 |

## List of Tables

|   |     |
|---|-----|
| Table 1.1: Explanatory variables of environmental disclosure.....                                     | 50  |
| Table 1.2: Sample distribution of firm-year observations across industries, years and countries ..... | 51  |
| Table 1.3: Descriptive Statistics .....   | 52  |
| Table 1.4: Correlation matrix of variables .....  | 53  |
| Table 1.5: Panel Regressions and two-step GMM regressions .....                                       | 54  |
| Table 2.1: Explanatory variables of environmental score .....   | 85  |
| Table 2.2: Sample distribution of firm-year observations across industries, years and country.....    | 86  |
| Table 2.3: Descriptive Statistics: Low Cost Strategy .....  | 87  |
| Table 2.4: Descriptive Statistics: Innovation Differentiation Strategy (R&D).....                     | 88  |
| Table 2.5: Descriptive Statistics: Marketing Differentiation Strategy .....                           | 89  |
| Table 2.6: Correlation matrix of variables: Low Cost Strategy .....                                   | 90  |
| Table 2.7: Correlation matrix of variables: Innovation Differentiation Strategy (R&D)...              | 91  |
| Table 2.8: Correlation matrix of variables: Marketing Differentiation Strategy .....                  | 92  |
| Table 2.9: Panel Regressions-Low Cost Strategy .....  | 93  |
| Table 2.10: Panel Regressions-Differentiation Strategy .....  | 94  |
| Table 3.1: Explanatory variables of environmental score .....   | 123 |
| Table 3.2: Sample distribution of firm-year observations across industries, years and countries ..... | 124 |
| Table 3.3: Descriptive Statistics: Low Cost Strategy .....  | 125 |

|   |     |
|---|-----|
| Table 3.4: Descriptive Statistics: Innovation Differentiation Strategy (R&D).....       | 126 |
| Table 3.5: Descriptive Statistics: Marketing Differentiation Strategy .....             | 127 |
| Table 3.6: Correlation matrix of variables: Low Cost Strategy .....                     | 128 |
| Table 3.7: Correlation matrix of variables: Innovation Differentiation Strategy (R&D) . | 129 |
| Table 3.8: Correlation matrix of variables: Marketing Differentiation Strategy .....    | 130 |
| Table 3.9: Panel Regressions-Low Cost Strategy .....                                    | 131 |
| Table 3.10: Panel Regressions-Differentiation Strategy .....                            | 132 |



## **Chapter 1: The effect of corporate social reputation and national context factors on environmental disclosure**

### **1.1 Abstract**

This chapter investigates the effects of corporate social reputation and external national context factors on environmental quality disclosure. Social reputation is viewed as a collective publicly held image of the firm which is built over time and reflects its unique prosocial behavior. Environmental disclosure follows the overall stance of the corporation in trading off social with economic considerations. The chapter draws upon the combined stakeholders - signaling perspective, focusing on data communicated by the firm in its effort to influence key stakeholders and to project a desired prosocial image in society. Hypotheses are formulated and tested using a large international panel data, obtained from the ASSET4 database. The data set comprises 3,215 firms originating from 21 countries covering the 2002-2012 period. This diverse international datasets provides an opportunity to explore the factors affecting the quality of environmental disclosure across sectors and countries. The results show that the firm's social reputation, represented by selected time lags of the social score in ASSET4, is a significant determinant of the environmental disclosure. Country-specific characteristics of a firm's host country, such as the environmental performance index of the country, openness to international trade, and regulatory quality and corruption, are also significant determinants of environmental disclosure. The analysis controls for firm-specific and sector characteristics. Theoretical and practical implications are discussed.

## 1.2 Introduction

In recent years corporate sustainability reporting has climbed top in the agenda of modern corporations, revealing aspects of both social and environmental conduct of the firm (Chen & Bouvain, 2009; Kolk, 2003). Disclosure of information in these reports provides signals to stakeholders and society at large about the extent to which a corporation is responsible (Robinson, Kleffner & Bertels, 2011), in an attempt to project its image and increase social acceptance and legitimacy (Deegan, 2007). To an extent disclosure is compulsory, with firms responding to pressures to comply with regulatory requirement sand standards imposed by industry associations. Mandated social and environmental disclosure has been recently promoted by governments and international organizations. Examples are the requirement for “triple bottom-line” reporting, which is part of most sustainability standards and is compulsory in certain countries (Brown, Guidry & Patten, 2009; Etzion & Ferraro, 2010); the EU directive for non-financial reporting, which is compulsory for large (EU Directive, 2014); national regulations on emissions and waste control, affecting corporations (Reid & Toffel, 2009). It can also be voluntary as firms undertake initiatives beyond compliance, in an attempt to influence the way they are perceived in the market and to form a desired image and reputation (Christensen et al., 2013; Van de Ven, 2008). We increasingly notice corporations to go beyond compulsory regulations and to communicate more proactive social and environmental behavior (Crane & Glozer, 2016). But there is variability as some firms have less to disclose, or prefer to stay “below the radar” avoiding being in the center of public attention (Desai, 2016).

Several scholars have paid attention to the factors that influence disclosure of social and environmental information. Firm-specific and industry factors have been investigated, such as size and visibility, age and financial performance (Andrikopoulos & Kiklani, 2013; Ortas et al, 2015; Zygliopoulos & Flemming, 2011; Van der Laan Smith, 2005). However firm reputation has not been considered as a determinant, but rather as an outcome, (Lee, 2016; Jayasinghe, 2016) despite the fact that a reputable firm cannot abstain from recent environmental and social initiatives such as climate change. Reputation is both an

outcome of past disclosure flows and also a determinant of new disclosures. Also research on the country-level institutional factors has been limited, and mostly directed to general or aggregate institutional indices than on specific more and relevant national factors (Ioannou & Serafeim, 2012; Maignan & Ralston, 2002).

Disclosure as such is a “strategic” communications variable used by the firm in its wider corporate affairs and public relations exercise in order to manage the impressions and the image it has gained in the minds of investors and other key stakeholders (Crane & Glozer, 2016; Lee, 2016; Van Riel & Fombrun, 2007). This can convey both the instrumental and normative perspectives. In the long run, disclosure and its counterpart in social reputation reflect both: (1) the moral motives and beliefs held within an organization about its ethical role and obligations to society, and (2) instrumental motives driven by the expected benefits from social practices (Aguilera, Rupp, Williams, & Ganapathi, 2007; Donaldson & Preston, 1995; Freeman, 1984; Jones, 1995; Lindenberg & Steg, 2007). These shape the desired image that the organization wants to achieve, and are manifested in the levels of prosocial and pro-environmental initiatives and practices undertaken and reported (Christensen et al., 2013; Van de Ven, 2008). The publicly held image of the corporation is a unique corporate characteristic, which differs across firms. It defines the character of the corporation which shows how much value the corporation gives to non-economic sustainability considerations, and how it trades-off social and environmental considerations against economic considerations (Blombäck & Brunninge, 2009). This is transferred to the memory of internal and external stakeholders (Barnett, Jermier, & Lafferty, 2006; Lange, Lee, & Dai, 2011; Lee, 2016), creating the overall reputation of the firm. Some firms are renowned for their prosocial stance and responsibility, while others emphasize profit seeking often at the expense of social considerations. The social character of a corporation is an asset stock which exhibits relative stability over time (Dierickx & Cool, 1989; Phillips & Zuckerman, 2001) and determines the level of environmental and social activities that the firm pursues, and hence disclosure.

Signaling theory has been used to study disclosure of information (Robinson et al, 2001). The firm transmits signals to shareholders and society through various marketing mechanisms, such as reporting, web sites and corporate image promotion strategies, to make the stakeholders aware about its aspired prosocial stance in its sustainability practices (Crane & Glozer, 2016; Du, Bhattacharya, & Sen, 2010; Jayasinghe, 2016). There is a variation of sustainability practices and reporting reflecting the way the firm perceives its aspired reputation. Some firms report a lot directly or through intermediates (King et al, 2011), aiming at reducing information asymmetries. Others may have less to report. Reporting is affected by the communications strategy of the firm, with some firms deliberately engaging in rhetoric and symbolic aspiration talk reporting intentions that are not fully reflected in actual behavior (Christensen, Morsing, & Thyssen, 2013), or engaging in selective reporting of highly visible issues (Zyglidopoulos & Fleming, 2011), or even in “green washing” (Laufer, 2003; Wagner, Lutz, & Weitz, 2009; Walker & Wan, 2012). Hopwood (2009) suggests even if environmental disclosure is supposed to be preferred by senior management to signal the quality of a firm to the public, it is possible that firms use environmental reporting as a “corporate veil”, in order to mitigate possible legitimacy questions and misguide stakeholders. The environmental quality disclosure decisions are similar to those the firm uses in disclosing the quality of its products (Dranove & Jin, 2010; Pisano, 2013).

The present chapter argues that the traditional prosocial reputation that the firm has achieved affects environmental disclosure. The corporation has, in its history, established a level of prosocial behavior, which depicts a trade-off between social and economic activities. This preexists of many environmental issues which have come late in the agenda, with similar trade-offs being transferred to such environmental issues. For instance climate change and material reuse are more recent than many aspects of social behavior (e.g. employment). In other words environmental demands already meet an established situation of social reputation and related relations with stakeholders. Prosocial behavior is embedded in the nexus of contracts the firm has formed with its stakeholders, as predicted by the instrumental stakeholder theory (Jones, 1995). Until

now most of the debate in the literature has centered on the effect of social responsibility on economic performance. To our knowledge there is limited research on the relationship between the non-economic aspects of sustainability, notably among social and environmental aspects. So there is a potential of exploring relations between such dimensions of performance (Brief & Motowidlo, 1986; Van Aaken, Splitter, & Seidl, 2013; Van de Ven, 2008). Hence the present chapter, while considering the role of social reputation in disclosure, at the same time provides some evidence on the relationship between social and environmental aspects of sustainability, to the extent that environmental disclosure represents the environmental performance of the firm. However all pillars of sustainability are managed simultaneously (Epstein et al, 2015), and to an extent the influence between environmental and social performance can be reciprocal, necessitating an endogenous treatment.

In addition to social reputation and firm-specific factors, exogenous macro-level factors may also affect the quantity of environmental information disclosed directly by the firm or indirectly. As maintained by the institutional theory (Campbell, 2007; Lammers, 2011; Oliver, 1991), corporate environmental responses are affected by societal pressures. According to institutionalism, firm's operations are embedded within broader social structures comprised of different institutions. These include formal and informal institutions such as state regulation, civil society, local communities, business and civil society associations and the market. Among them prominent role play the initiatives of international organizations. Examples are the United Nations initiatives to meet the climate change challenge (e.g. Cop21 for reduction emissions), the Sustainable Development Goals (see e.g. Thompson, 2015), the European Commission directive on non-financial reporting (EU Directive, 2014). These enter the national -level regulations and influence the expectations of stakeholder groups and local communities. Hence stakeholders expectations and corporate cues to them are also the micro-mechanism at work, under the general provisions of institutionalism. However there is a variety of corporate environmental responses, and hence of related reporting, even against

compulsory regulations (Reid & Toffel, 2009). The range of responses vary from proactive to reactive ones (Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2008).

This research considers the role of specific institutional factors at the country level. While the effects of firm and industry characteristics have been explored in the environmental disclosure literature (Clarkson, Li, Richardson, & Vasvari, 2008; Halme & Huse, 1997), country-related factors have yet to be examined in a systematic way using large cross-section samples of countries. Previous studies show that the level of adoption of CSR-related activities and environmental performance vary significantly across countries (Ioannou & Serafeim, 2012; Maignan & Ralston, 2002) and this variance may be attributed to institutional differences (Ball & Craig, 2010; Hall & Soskice, 2001). However, most of the previous studies examine only gross institutional influence, not the influence of specific dimensions of the country regulatory environment. The present chapter adds to the literature by testing the effect on environmental disclosure levels of certain specific characteristics of firms' host countries related to country sustainability policies, openness of the economy, regulatory quality, and law enforcement and corruption.

The chapter draws upon a large international sample comprising 3,215 firms hosted in 21 countries, over the 2002-2012 period. These data have been taken from the ASSET4 database which reports on secondary quantitative and qualitative information taken from corporate sources. The sample used has certain advantages as it provides extensive and more robust international data. This is an obvious advantage when compared with previous studies that have utilized datasets predominantly for the US, Canada, or a very limited sample of European countries (Van der Laan Smith, Adhikari, & Tondkar, 2005); (Chen & Bouvain, 2009). Therefore, most previous studies miss the role of national-context differences, which may affect the relationships examined. The inferences based on these datasets are limited due to the focus on the US market predominantly. It should also be mentioned here that the data used in this chapter enable us to evaluate the effect of corporate social reputation on environmental disclosure, correcting for the endogeneity between social and environmental variables. Moreover the large dataset

allows us to use advanced data panel data estimation framework with a two-step feasible efficient generalized method of moments (GMM) and with validity-tested instruments.

### **1. 3 Theoretical background and hypotheses development**

#### *1.3.1 Environmental disclosure and social reputation*

As described earlier corporate reputation in general can be viewed as a capital or asset stock that the firm accumulates over time (Dierickx & Cool, 1989) . However, corporate reputation is a composite concept comprising several dimensions, such as economic performance, innovativeness, quality in product and services, workplace environment and leadership (Fombrun, 1996; Harrison and Freeman, 1999). It comprises the specific for the firm balance among the three pillars of sustainability - economic, social and environment, as perceived by key stakeholders in the market. Here we focus on the social pillar of reputation, as determinant of the level of environmental activity of the firm, and hence disclosure. Social reputation is a collective impression imprinted in the minds of stakeholders (Fombrun, 1996). It is part of the wider concept of reputation, with a variety of definitions (Barnett et al, 2006; Walsh et al, 2009; Lange et al, 2011, Van Riel and Fombrun, 2007). It is an enduring characteristic of the firm shaped over time through its history of choices with prosocial initiatives, such as social contributions, employment and labor conditions. There is a variation in the market as different firms achieve various levels of social reputation. For instance some firms receive awards for their exemplar prosocial behavior, as indicated by awards of “best place to work” and other distinctions. Others are reputable for their attention to the interests of shareholders, e.g. sacrificing employment considerations to favor profitability (see, e.g. Toyota versus GM, in (Yoshimori, 2005)).

A socially reputable firm chooses to disclose more of its social and environmental practices to increase transparency and reduce information asymmetry between the firm and stakeholders, i.e., investors, society, clients, and the market (Eccles, Ioannou, &

Serafeim, 2014; El Ghouli, Guedhami, Kwok, & Mishra, 2011; Khurana & Raman, 2004). A prominent rationale explaining the relationship between corporate reputation and environmental disclosure is provided by signaling theory (Robinson et al, 2011), in relation to stakeholders theory (Donaldson & Preston, 1995; Freeman, 1984; Jones, 1995). According to signaling, one party credibly conveys some information about itself to another party. A mix of signals is addressed to stakeholders and the market in general, disclosing information about economic and non-economic initiatives and actions, to create positive attitudes and the overall reputation of the company (Fombrun & Shanley, 1990; Toms, 2002). Thus, the firm actually chooses the content of the social and environmental disclosure according to its views about the effectiveness of the signals and the desired image it wants to achieve.

Social reputation acts as a “mirror” mechanism, through which the firm can see the image of itself which it conveys to stakeholders (Cooley, 1992; Goffman, 1959). This feeds back on actions as the firm wants to portray a desired image to stakeholders and acts accordingly, sending signals through reporting. So the perceived social image or reputation can be a determining factor regulating the disclosure decisions of the firm. This complements the influence of internal moral motives which may act as a duty regardless of effects on reputation. However it should be noted that many of the environmental issues have been new in the corporate agenda compared with the old tradition of social practices, such as customer relations and employment conditions. The later have been for long into the agenda, before the initiation of environmental actions such as for climate conditions and global warming. The demands for pro-environmental behavior and greening of corporations have been mounting more recently. So they already meet an established situation of social reputation and related relations with stakeholders. In this respect it is likely that the influence will be from the long established prosocial orientation of the firm to environmental activity. The logic of trade-off between social and economic aspects transcend the choice of environmental actions and trade-offs. According to the instrumental stakeholders theory (Jones, 1995), the ethical character of the corporation is embedded in the nexus of stakeholder relationships, and the cooperation and trust

which they convey. The “relational contracts” with various external and internal stakeholders (Eisenhardt, 1989) are specific to each firm, and exhibit a stability through time. These contractual relationships constitute a unique corporate characteristic which is extended to the relational contracts added along environmental issues. Actor interconnectedness and diffusion takes place, as the actors involved in social and environmental contracts overlap and synergies arise. In other words, higher social contractual relationships are expected to be associated with higher environmental relationships. However, despite the arguments for social determinism of environmental inclinations, both are intertwined and causation of influence can at least partly be the other way. So we have to account for the effect from environmental to social.

According to the above argument, social and environmental responsibility and reputation are likely to be symmetrical, achieving similar levels of trade-offs with economic aspects. It is expected to obtain a consistency of behavior with the corporation sacrificing economic value for both social and environmental initiatives along its traditional reputation. This is effected by transmitting signals in the market and society at large about the corporation’s social and environmental responsibility projecting traditional patterns (Mitnick, 2000; Bansal and Kistruck, 2006; Yoon et al, 2006). Disclosed signals constitute symbolic actions that are issued for impression management purposes (Neu, Warsame, & Pedwell, 1998; Desai, 2014). The implicit assumption behind the disclosure strategies is that, by selecting what to communicate, the firm can influence the impressions of consumers and other stakeholders, and may get the expected benefits of the social acceptance it desires and can achieve (Bansal & Kistruck, 2006). The prevailing view is that consumers may interpret non-reporting as suspicious of lower quality social performance or deviant practices. Thus disclosure can be of strategic value in the context of the decision-processes of the firm, similar to quality disclosure of its products (Dranove & Jin, 2010; Pisano, 2013). Through such signaling, the firm influences the external perceptions of its reputation, as these perceptions are linked to internal resources and capabilities of the firm regarding its environmental practices (Hart & Dowell, 2010). Environmental reporting is supposed to be linked to substantive actions, or at least to convey message

of such linkage. Aerts & Cormier (2009) provide evidence that the environmental disclosure items contained in annual reports and environmentally related press releases affect the perceived environmental legitimacy.

In this context, a firm with high social reputation is likely to disclose more environmental information. This dynamic relationship may be a result of the firm's drive for social desirability and a belief that building higher social capital may create corporate value (Cho & Patten, 2007; Cho, Roberts, & Patten, 2010; Patten, 2002). Achieving a leading position in environmental practices may take internal momentum, as the firm is living the values of sustainability. Hence, the firm is in a position to disclose more substantive and quality information about its environmental practices (Brown, Guidry, & Patten, 2009). By contrast, firms with poor reputation may not have enough information to report and hence send weak or vague signals to the market. Issuing symbolic signals that are decoupled from internal substantive actions may take the form of general rhetoric, which can be easily discounted by the market or may marginally affect scores such as those provided by ASSET4. Hence, firms with poor social reputation are likely to exhibit decreased environmental disclosure.

In practice there is a variety of marketing and corporate relations tools the firm can choose from, to signal its responsibility in the market. These include direct reporting, websites and various public relations and marketing mechanisms (Van de Ven, 2008), and also indirect mechanisms such as intermediaries or third – party organizations and certifiers. The latter constitute the so called “decentralized institutions” which can be used for credible disclosure purposes (see (King, Lenox, & Terlaak, 2005)). The Reuters ASSET4 database used in the present study can be viewed as a third party, which collects information from disclosed firm sources and produces comparative indices which disseminate to key stakeholders (investors, consumers and others). Adoption of information by third parties may give the impression to stakeholders that the disclosed information is verified and more trustworthy than direct corporate reporting. So third-parties may be preferred by the firm as an alternative channel to extend its quality

signaling, often transmitted to wider audience than self-reporting. Due to its control of the original sources, the firm is in a position to influence the information disclosed.

Given the above discussion, the following hypothesis can be advanced:

*H1: The higher the social reputation a firm has built over time, the greater the environmental disclosure the firm exhibits.*

### *1.3.2 Environmental disclosure and national context factors*

Regarding external context factors, it is expected that societal pressures and the country policies towards sustainability induce firms to undertake initiatives for compliance and transparency, in order to gain legitimacy. Campbell (2007) suggests that firms are more likely to undertake CSR activities if they face societal pressure exerted by different constituencies in their business environment. In societies where sustainability is pronounced in policy provisions and public debate, stakeholders expectations are rising and this affects firms' compliance. Triple-bottom line reporting, which is compulsory in certain countries, the diffusion of sustainability standards, and non-financial reporting compulsory for large firms in EU, are initiatives which affect corporate responses (Brown et al., 2009; Etzion & Ferraro, 2010; EU Directive, 2014). In countries where demands for corporate transparency are highly valued, firms would be more actively engaged in reporting on their activities to maintain legitimacy and acceptance by stakeholders and the general public. They may adopt codes and standards, and seek the certification by third party institutions to advance their positioning (King et al., 2005). There is evidence that CSR reporting is important for firms when they need to show that they are transparent (Levy et al, 2010). Regulatory quality and rule of law enforcement are important for firms striving to comply and to show public legitimacy. Fifka (2013) provides an overview of 186 studies investigating internal and external determinants of corporate sustainability reporting and argues that there is an evident effect of national context

factors, but issues about country factor determinants of corporate sustainability disclosure remain to be examined. It is expected that cultures and societies that exhibit greater transparency will push firms for higher levels of disclosure of non-financial information.

At a theoretical level the wider institutional context of a country is important in driving firm behavior as it can exert coercive and normative pressures. This view is at the center of the arguments advanced at macro level by institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1987) . According to this perspective, firms operate within a social framework of rules, norms and values about what constitutes appropriate behavior. As a result, they adopt practices that are considered as legitimate by other organizations or actors in their environment. They may conform to institutional pressures (Scott, 1987), such as social and ecological pressures, which coexist with market pressures. These pressures can be coercive, such as legislation about reporting and environmental standards, or they can be normative pressures transmitted through imitation and cultural norms (DiMaggio & Powell, 1983; Meyer & Rowan, 1977)

The institutional perspective, however, has to be viewed at the micro level, taking into account the mechanisms through which pressures are transmitted at the firm level. As regards compulsory regulations compliance is assured through monitoring and law enforcement. The reactions of stakeholders such as social groups and NGOs can affect the process, drawing attention on corporate conduct. Regulatory policies, rules and norms advanced by national institutions create a climate which affects all stakeholders. This can force firms to comply to avoid being at the center of negative publicity and litigation initiatives. Pressures can be both coercive and normative, exerted by institutions and competitive pressure. The mediating factor is stakeholders and their direct influence on firms and regulators. Many firms prefer to develop a dialogue with regulators and other stakeholders engaging them in their environmental strategies (Jones, 1995; Morsing & Schultz, 2006). Through active stakeholder involvement they may preempt criticism of non- compliance. In addition there are positive incentives for advancing

dialogue. Through interaction firms may find opportunities for further initiatives, innovation and joint value creation (Desai, 2016; Porter & Van der Linde, 1995; Sharma & Vredenburg, 1998). Many of the existing environmental standards may bite all firms, reactive and proactive, e.g. emission controls and solid waste. But prosocial organizations, aiming at creating respective social reputation, are likely to move beyond compliance, undertaking initiatives and entering into dialogue for better implementation with regulators and NGOs. The benefits and motives vary, ranging from social acceptance to altruistic behavior (Aguilera et al., 2007; Egri & Herman, 2000; R. Edward Freeman, Pierce, & Dodd, 2000; Lindenberg & Steg, 2007; Papagiannakis & Lioukas, 2012).

In this study, certain national context factors are examined as possible determinants of the observed differences in levels of environmental disclosure among firms. These factors account for environmental policies of the country, the openness of the economy to international trade, regulatory quality and corruption levels. As argued above, in a national context with public policies pushing towards sustainability, firms are likely to adopt environmental practices regardless of their actual efficiency (DiMaggio & Powell, 1983) and hence to report more information concerning their environmental practices. An index which can represent the national policy context is the *environmental performance index*. In addition, higher levels of *openness of the economy* and trade liberalization, as measured by international trade activity over GDP, can shape CSR practices. Firms operating in an open environment are expected to be more sensitive to international and national environmental demands, hence showing higher levels of environmental disclosure (Flammer, 2015). Mimetic or competitive isomorphism is likely to operate as firms adopt the practices of other international competitors and organizations (DiMaggio & Powell, 1983). Furthermore effects can be enhanced by the demands of more informed stakeholders and related activism, inducing the firm to actively communicate its environmental strategies (Crane & Glozer, 2016; Desai, 2016; Du et al., 2010; Morsing & Schultz, 2006). Lastly, the *quality of regulation* within a country, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations, is expected to be associated with a firm's level of

environmental disclosure. The quality of regulation within a country reflects perceptions of the ability of the government to formulate and implement sound policies and regulations and is expected to be associated with a firm's level of environmental disclosure (Pedersen, Neergaard, Pedersen, & Gwozdz, 2013). Parallel to this, high levels of corruption within a country can also lead to a lower degree of environmental disclosure, as pressures for transparency may not be effective. (Fredriksson & Svensson, 2003) found that a country's corruption level reduces the stringency of environmental regulations. In this way, when countries exhibit low law enforcement capabilities, firms are less likely to implement regulations about environmental practices (Ioannou & Serafeim, 2011). This is further supported by evidence showing that differences in CSR adoption among countries are formed by the state's coercive pressures (Jackson & Apostolakou, 2010). Moreover, (Hartmann & Uhlenbruck, 2015) argue that the international commitment of an environmental treaty could be transferred by the state into national laws. Thus, the efficiency of a country's law enforcement is important for the actual compliance with a treaty's obligations.

These arguments lead to the following hypotheses:

*H2: The higher the environmental sustainability index of the host country, the greater the environmental disclosure at the firm level.*

*H3: The greater the openness of the economy of the host country, the greater the environmental disclosure at the firm level.*

*H4: The greater the quality of regulation in the host country, the greater the environmental disclosure at the firm level.*

*H5: The higher the corruption level of the host country, the lower the level of environmental disclosure at the firm level.*

## 1.4 Methods, variables and sample

### 1.4.1 Econometric model

The following generic panel data regression model is adopted to explain the observed environmental disclosures at the firm level:

$$y_{it} = \mu + a_i + \alpha_t + \sum_{g=1}^G \beta_{gi} x_{git} + \sum_{k=1}^K \gamma_{ik} z_{kt} + u_i + \varepsilon_{it}; \quad (1)$$

$$\varepsilon_{it} \sim \text{i. i. d. } (0, \sigma_\varepsilon^2), E(u_i) = 0, E(u_i^2) = \sigma_u^2, E(\varepsilon_{it} u_j) = 0, \text{ for } \forall i, t, j; E(u_i u_j) = 0, \text{ if } i \neq j$$

where  $i=1, 2, \dots, n$  identifies the firm;  $t=1, 2, \dots, T$  denotes the year;  $y_{it}$  is the environmental disclosure score of firm  $i$  in year  $t$ ;  $x_{git}$  is a matrix of  $G$  explanatory variables that includes the social score and controls for slack, age, size and return on assets;  $z_{kt}$  is a matrix of  $K$  firm-invariant explanatory variables for the country indices used;  $a_i$  and  $\alpha_t$  are constant terms that allow for the possibility of (constant) heterogeneous behaviour between the firms ( $a_i$ ) and over the yearly time periods ( $\alpha_t$ ), respectively;  $\beta_{gi}$  measures the effect that the  $g$ th explanatory variable has on the environmental disclosure score of firm  $i$ ;  $\gamma_{ik}$  estimates the sensitivity of the environmental disclosure score of firm  $i$  on the  $k$ th variable;  $\varepsilon_{it}$  is a white noise error term following a distribution with mean zero and variance  $\sigma_\varepsilon^2$  and represents the within-firm errors; and  $u_i$  represents the between-firm errors.

As the dataset comprises both cross-sectional and time series observations, panel data regressions are adopted to estimate equation (1). To select between the fixed-effects and random-effects specifications of the panel data estimation methods, the Hausman (1978) test is conducted to test the null hypothesis that the preferred model is the random effects vs. the alternative of fixed effects model. Once selected, the fixed- or random-effects specification is tested against a pooled OLS specification through the following: (1) a separate F-test for the fixed-effects ( $H_0: a_i = 0, \text{ for } i=1, \dots, n$ ) and the time-fixed effects ( $H_0: \alpha_t = 0, \text{ for } t=1, 2, \dots, T$ ) specifications versus a pooled OLS specification and (2) the Breusch & Pagan (1980) Lagrange Multiplier (LM) test for the random-effects versus a

pooled OLS specification. The performed estimations control for firm, country, industry and year fixed-effects. With respect to the estimation of standard errors, (Petersen, 2009) shows that in panel datasets when estimating fixed effects models, firm or time clustering of standard errors individually may lead to biased standard errors. Avoiding such bias involves the estimation of both firm and time dimensions cluster-adjusted standard errors (Petersen 2009; Thompson, 2011), which is adopted in the fixed-effects regression of this chapter.

#### 1.4.2 Variables

All *xgit* and *zkt* variables in equation (1), their precise definitions, and their a-priori expected signs are presented next and summarized in table 1.1.

**Dependent Variable:** The *environmental disclosure score*, defined as the number of environmental indicators that the ASSET4 analysts were able to find for the focal firm, over the total number of the 46 pre-determined environmental indicators for which they were looking. These are assembled by ASSET4 from a variety of publicly available sources: annual reports, websites, stock exchange filings and news sources (Ribando & Bonne, 2010). This indicator is likely to represent the environmental quality disclosure as “companies with the most to hide are the least likely to volunteer” to disclose poor practices or lack of practices (Ribando & Bonne, 2010, p.3).

Social reputation is indicated by the *social score*, defined by ASSET4 as a score that “measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.” This includes indicators for the following aspects of social performance: employment quality, health and safety, training and development, diversity, human rights, community, product responsibility. This is an indicator of social reputation. The expected sign is positive

because the larger the social score of a firm, the higher its inclination to disclose environmental information. Various time lags are tried given that reputation is a cumulative entity.

**Firm-related factors** include: (1) The *slack*, defined as the cash and cash-equivalent items on the balance sheet statement. The expected sign is positive, as higher levels of slack are expected to be associated with higher levels of environmental disclosure because the firm has more available resources to allocate to its communications policy, including resources for the disclosure of its environmental activities. (2) The *age* of the firm, defined as the number of years during which the firm has operated. A positive sign is expected because firms with age generally have a higher visibility and therefore are inclined to disclose more environmental information. (3) The *size* of the firm, which is represented by the number of total employees for the firm (in log form). Larger firms are politically more visible and more exposed to social pressures for environmental performance. They also tend to have superior resources to devote to environmental practices. Hence, a positive sign is expected because firms with size are expected to be more likely to disclose environmental information (Andrikopoulos & Kriklani, 2013; Ortas, Gallego-Alvarez, & Álvarez Etxeberria, 2015). (4) The *return on assets* (ROA), defined as net income over total assets. A positive sign is expected because with greater profitability more resources are available to be invested in environmental activities and non-financial reporting.

**Country factors:** (1) The *environmental performance index* (EPI), which reflects the level of firms' environmental practices and awareness within the host country. The expected sign is positive because countries that exhibit higher levels of environmental awareness tend to be host countries for firms that disclose more information regarding their environmental practices. (2) The *openness ratio* =  $((imports + exports) / GDP)$  is defined as the summation of imports and exports over the GDP of each country in the sample. A positive coefficient of openness is expected because firms operating within countries that exhibit higher levels of trade liberalization tend to adopt CSR practices and non-financial reporting to a greater extent (Flammer, 2015). (3) The *regulatory quality index*, which

reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development in compliance with environmental regulations. (4) *The corruption index*, which indicates perceptions of the extent to which public power is exercised for private gain. Higher values of the index indicate lower levels of corruption within a country. A positive sign for the corruption index is expected, as lower levels of corruption lead to law enforcement, greater transparency and hence environmental disclosure.

#### 1.4.3 Endogeneity issues

In estimating equation (1), endogeneity issues can arise among environmental disclosure and social reputation (represented by the social score) as both are both pillars of the same factor, overall corporate reputation policy (omitted variables problem), and also because of reverse causality. For this reason, the social score appears in our reported panel data estimations with a two periods lag. In this way, social score is predetermined, and any simultaneity bias is mitigated. However, the use of lagged values is not a perfect remedy for endogeneity when omitted variable (reputation policy) and reverse causality exist. For this reason, and to complement the above panel data analysis, we adopt an instrumental variables (IV) approach through the use of a two-step feasible efficient GMM estimator. The estimated coefficients through the IV approach are more likely to be consistent but may also exhibit higher standard errors (Wooldridge, 2002). To obtain unbiased results when estimating an IV equation, the instruments used need to be exogenous with respect to the endogenous variables. Thus, in order for our model to be over-identified, we choose the following two instruments with two-period lagged values: (1) the board function score, which reflects firms' capacity to set up effective board committees with allocated tasks and responsibilities, and (2) the board structure score, which measures firms' capacity to ensure independent decision-making through an experienced, diverse and independent board. Both these scores are indicators of corporate governance.

These two instruments are chosen based on the arguments explained below, which support their exogeneity and relevance: for a given firm, the previous two years' values of corporate governance related scores, such as the board function score and the board structure score, are expected to be associated with social reputation (social score) but not necessarily with the current years' environmental disclosure. In other words, the corporate governance characteristics of previous years are expected to affect the current year's environmental disclosure score only through the social score. Thus, the selected instrumental variables are theoretically strong candidates to be valid instruments because they are likely to be correlated with the social score (the endogenous variable) but not with the error term of equation (1). To test if our equation is identified, we conduct the Kleibergen & Paap (2006) test, which is a Lagrange Multiplier (LM) test of the null hypothesis that the equation is under-identified. In addition, instruments' exogeneity is examined through the (Hansen, 1982) test, where the null hypothesis is that instruments are exogenous, i.e. uncorrelated with the error term. Therefore, when the Hansen J-statistic is insignificant and the p-value large enough, the null hypothesis of exogeneity is not rejected.

Another potential issue of concern in our estimations is the presence of heteroskedasticity. If heteroskedasticity is present, the IV coefficient estimates remain consistent, but their corresponding standard errors are not (see, e.g., Baum, Schaffer, & Stillman, 2003). To address this issue, we adopt a GMM estimator and report clustered-adjusted standard errors at the firm level to enable valid inferences. The two-step GMM estimator with standard errors clustered at the firm level is shown to be robust in the presence of heteroskedasticity in our estimated model.

#### *1.4.4. Data and sample*

The main source of the panel data set used in this chapter is the Thomson Reuters ASSET4 database, which provides environmental, social and corporate governance data (ESG) for a large number of firms worldwide, starting in 2002. Thomson Reuters assigns trained

research analysts to collect more than 750 evaluation points for each firm under the requirement that all of the data incorporated into the evaluation points are publicly available. However, the resulting ESG evaluation points do not share the same standardization worldwide, even if there are efforts towards this direction – see, e.g., the recent proposal for the EU Directive (2014) focusing on non-financial reporting. Due to this lack of common standards and to enable comparability of the collected data, ASSET4 incorporates the collected evaluation points into consistent ESG scores to enable quantitative analysis and comprehensive comparisons. For example, the environmental evaluation points typically include information on energy used, water recycled, carbon emissions, waste recycled, and pollution. Subsequently, every year the 750 evaluation points are used as inputs to a specific weighted formula to calculate 280 key performance indicators (KPI's), which are further classified into 18 categories within four pillars: environmental, social, corporate governance and economics. According to ASSET4's documentation, in a given year, each firm receives a z-score for each of the four pillars. This z-score represents a firm's relative ranking against the other firms based on the information available until the previous year.

We include in our sample data from 21 countries during the 2002-2012 period, which account for 3,215 firms out of the universe of ASSET4's database, which comprises 60 countries and a total of 3,894 firms. The selection of countries covers the great majority of the developed and emerging economies around the globe. Firm-wise, the sample utilized in this chapter covers 82.56% of the total available firms in the ASSET4 database. For each country-firm-year combination, we calculate the environmental disclosure score as the percentage of environmental items that were disclosed by the firm and that ASSET4 database was able to include in their database out of the total number of environmental items that the ASSET4 database seeks from firm disclosures. The starting panel data set comprises 35,365 firm-year observations and a cross section of 3,215 firms; however, computing the environmental disclosure score is not possible for all firms in all years due to data constraints. Thus, the final sample comprises 22,784 firm-year observations and a cross-section of 2,687 firms. However, a considerable number of values for some of the

variables are missing, which further limits the available observations for estimation purposes to a total of 13,074 firm-year observations. Thus, our final sample comprises an unbalanced panel data set.

This dataset is subsequently matched with firm-level data provided by Datastream and WorldScope databases on firm age, the total number of employees, the ratio of EBITDA (item WC18198) over total assets (item WC02999) and sector classification. The sector classification follows the industry classification benchmark (ICB) provided by the WorldScope database (item WC07040). The first level of ICB classification is used, which comprises the following broad sectors: basic materials, consumer goods, consumer services, financials, healthcare, industrials, oil and gas, technology, telecommunications and utilities. In addition, the item cash and cash equivalents from the WorldScope database (item WC02005) are used to proxy for firms' financial slack.

To account for national context factors, which may affect environmental disclosures at the firm level, we introduce a set of country indices, such as the following: the environmental performance index (EPI), which is published by Yale University and ranks countries on performance indicators across policy areas (EPI, 2014); the level of openness of the economy, defined as the ratio of ((imports + exports) / GDP), computed with data obtained from Thomson Reuters Eikon; and the quality of regulation and the corruption indices published by the World Bank. Finally, to mitigate the effect of potential outliers, all variables are winsorized at the 1st and 99th percentiles.

Table 1.2 shows the distribution of the firm-year observations for the final sample across industries, years and countries. Panel A of table 1.2 reveals a balanced representation of different industries in the sample. Financial and industrial firms are the most represented industries in the sample with 4,364 and 4,068 firm-year observations, respectively. In contrast, utilities and telecommunications are the least represented industries with 1,038 and 431 firm-year observations, respectively. Panel B of table 1.2 shows that apart from the first two years of the sample (2002-2003), there is a steady and slightly growing availability of firm-year observations for the period 2004-2012. Panel C of table 1.2,

reports the distribution of the firm-year observations according to the host country of the firms. The US, Japan and the UK are the most-represented countries with 7,639, 3,436 and 2,884 firm-year observations, respectively, whereas Austria, Brazil and Portugal are the least-represented countries with 165, 157 and 102 observations, respectively.

### 1.5 Results

Table 1.3 presents descriptive statistics for all of the variables included in the sample. The mean value of the environmental disclosure score is 47.82%, and the standard deviation is 11.86%, which shows that there is considerable variation in the dependent variable of our model. Social score exhibits a similar mean value of 50.59%, but with considerably higher variation at 30.77%. The slack variable has a mean value of \$33.1mln.; however, the median value is equal to \$458,615, indicating that the mean value is driven by some remaining large positive outliers. The mean age of the firms is 19.34 years with a standard deviation of 12.36 years. The mean number of employees is 26,097; however, again, the median value is 8,036, revealing that some large positive outliers drive the mean value. Regarding the ROA, the mean value is 49.05% with a standard deviation of 21.61%. Turning to the country indices, the EPI index has a mean value of 59.83% with a low standard deviation 5.49%. The openness ratio has a mean value of 0.49 and a median value of 0.26, indicating that imports and exports represent approximately 26% of a country's GDP. Lastly, the regulatory quality and the corruption indices share similar distributions with mean values of 1.44 and 1.57, respectively, albeit the corruption index exhibits a larger standard deviation of 0.52 when compared to the regulatory quality index, which has a standard deviation of 0.38. The p-values of the Jarque and Bera (1980) test statistic strongly reject the null hypothesis of normality for all of the variables.

In table 1.4, pair-wise correlations among all variables are presented. To mitigate any multicollinearity concerns, we avoid using simultaneously in our estimated models pairs of variables that exhibit linear correlations in excess of 0.6. Apart from the instrumental variables, the only pair of independent variables exhibiting a linear correlation in excess

of 0.6 is the corruption and regulatory quality indices with a correlation coefficient of 0.72. Thus, these indices are used interchangeably in our estimated models. We report only the most parsimonious models in terms of individual significance (t-statistics) and maximization of the adjusted  $R^2$ .

Column 1 of table 1.5 presents the benchmark panel data specification, which examines the relationship between environmental disclosure scores and the social score while controlling for firm characteristics and national context variables. In addition, as described earlier in the chapter, the endogeneity bias issue could arise in our benchmark panel data estimations due to simultaneity bias (i.e., that levels of environmental disclosure and social score are determined simultaneously), reverse causality (i.e., that high levels of environmental disclosure could also improve a firm's reputation), or a correlated omitted variables issue (i.e., that both environmental disclosure and corporate reputation are correlated with a third unknown and omitted variable). For this reason, in the benchmark panel data estimation presented in column (1), we include the two-period lagged value of the social score. The coefficient of social score is positive and highly significant (0.0017, t-stat = 8.25). Other time lags give also similar significant coefficients. In addition, the coefficients of all of the firm-specific control variables exhibit the a-priori expected positive signs and are highly significant: the logarithm of the slack variable (0.0066, t-stat = 7.45); the age of the firm (0.0008, t-stat = 6.37); the logarithm of employees used as a proxy for size (0.0054, t-stat = 4.88) and the return on assets (0.0001, t-stat = 2.65).

From the country-specific indices, only the coefficient of the country environmental performance index is significant and exhibiting the expected positive sign (0.0135, t-stat = 2.59), whereas the coefficients of the openness ratio and the corruption index exhibit the a-priori expected positive signs but are statistically insignificant. Due to the aforementioned high linear correlation between the corruption and regulatory indices, we only include the corruption index in column (1). This is because when estimating the model with the regulatory quality index instead of the corruption index, the coefficient is

insignificant and the overall explanatory power of the estimated model, measured by the adjusted  $R^2$ , is lower.

Regarding the diagnostics of the model estimated and presented in column (1), the (Hausman, 1978) Wald test statistic and its associated p-value (0.0000) strongly reject the null hypothesis that the random effects estimator is appropriate for the specified model over the fixed effects model. Thus, we include country, industry and time fixed effects, which account for unobserved heterogeneity in the sample examined. The inclusion of country, industry and time fixed effects is also confirmed by the associated F-statistics presented in column (1). The null hypothesis that a pooled ordinary least squares (OLS) model would be favorable compared to a fixed effects specification (country, industry or time fixed effects) is strongly rejected in all cases.

Further, to verify the validity of our results to potential endogeneity bias, we perform a two-step efficient GMM estimator and report the results in columns (2) and (3). We use an instrumental variables (IV) regression to treat social score as an endogenous variable and examine whether our results are driven by endogeneity between environmental disclosure and social reputation (social score). The instrumental variables used are the two-period lagged values of the board function score and the board structure score.

Column 2 of table 1.5 reports the first-stage results of the two-step feasible GMM estimator, where the dependent variable is the endogenous variable, the social score. The coefficients of the instrumental variables are expected to be positive because, according to the stakeholder theory, the higher the corporate governance-related scores (i.e., the board function score and the board structure score), the higher the social performance (hence social reputation) of a firm. As observed, the coefficients of the instrumental variables are positive and significant as expected a priori. Next, column (3) of table 1.5 reports the second-stage results and confirms a positive and statistically significant coefficient for social score (0.0027, t-stat = 7.27), indicating that endogeneity is not driving the main hypothesis of this chapter. However, when focusing on the control variables, the results differ compared with the benchmark panel data estimations

reported in column (1). Specifically, only the coefficients of the natural logarithm of slack and the age of the firm remain positive and significant (0.0049, t-stat = 3.90 and 0.0007, t-stat = 4.56, respectively), whereas the coefficients of the natural logarithm of employees and the return on assets are no longer significant. The originally significant and positive sign of the logarithm of employees variable and the return on assets can be attributed to the original baseline models suffering from the presence of endogeneity, which is addressed successfully with the GMM-IV estimation framework. Lastly, regarding the country indices, the EPI carries the expected positive sign and remains significant (0.0154, t-stat = 3.96), and the openness ratio and the corruption index are estimated with positive and statistically significant coefficients (0.0748, t-stat = 2.79 and 0.0348, t-stat = 4.32, respectively).

Regarding the diagnostics of the first-stage results presented in column 2, and to test for the under-identification of the estimated equations, the Angrist & Pischke (2009) Wald statistic is reported, which is distributed asymptotically as  $\chi^2$ . The null hypothesis of the test is that the particular endogenous regressor in question (the social score) is unidentified, which is strongly rejected for the first-stage equation, i.e., the p-value of the test is 0.0000. For the second-stage results presented in column 3, the centred  $R^2$  is equal to 53.49% and the F-test strongly rejects the null hypothesis (p-value of 0.0000) that all of the estimated coefficients are jointly equal to zero. To test for under-identification of the second-stage results, the Kleibergen-Paap LM statistic (Kleibergen & Paap, 2006) is reported, which strongly rejects the null hypothesis of under-identification (p-value of 0.0000). Next, we test for the possibility of weak identification by reporting the Cragg & Donald (1993) and Kleibergen-Paap Wald F-stat weak identification tests, which are estimated with the values of 105.63 and 46.95, respectively. These values are far higher than the critical value provided by Stock and Yogo (2005), which for a 10% significance level is equal to 19.93. Thus, the null hypothesis of weak identification of the instruments used is strongly rejected, indicating that the instruments used are strong and relevant. Lastly, we report Hansen's (1982) over-identification test, where the null hypothesis is that the instruments are exogenous or, in other words, uncorrelated with the error term.

As observed in column (3), Hansen's J statistic is equal to 0.80 and strongly insignificant because the p-value is 0.3712, which is far greater than the usual statistical significance percentages and thus strongly does not reject the null hypothesis of exogeneity of the instruments. These statistical tests verify the validity of the instruments used and confirm their relevance and exogeneity.

### **1.6 Discussion and conclusion**

This chapter examined whether social reputation, a result of the enduring prosocial orientation of the firm, and national context factors lead to higher levels of environmental disclosure. The results presented reveal that firms with strong social reputation, as expressed by the social score, choose to disclose more information regarding their environmental practices. So the levels of environmental disclosure and social performance are related and move in the same direction. Signaling theory in conjunction with the stakeholders perspective provide a framework to explain this positive relationship: socially inclined firms choose to disclose more information regarding their environmental activities. They are transmitting cues or signals to the market, to reduce the informational asymmetry and create favorable impressions for the company by different groups of stakeholders (Robinson, et al., 2011). They do that to convey to the market their aspired image of responsibility (Barnett et al., 2006; Crane & Glozer, 2016; Lange et al., 2011; Lee, 2016). Their ethical stance appears to be symmetrical across the environmental level and the social pillar of sustainability. This can be explained by instrumental stakeholders theory, which maintains that corporate responsibility is embedded in the nexus of contractual relations with stakeholders that the firm accumulates over time (Jones, 1995). The "relational contracts" with various external and internal stakeholders (Eisenhardt, 1989) are specific to each firm, and exhibit a stability through time. These contractual relationships constitute a unique corporate characteristic which is extended to the relational contracts added along environmental issues. Actor interconnectedness and interaction impose the same levels of responsibility

across pillars, as the actors involved in social and environmental contracts overlap and synergies arise. In other words, the social character of the corporation expands to environmental concerns, making it unlikely for firms to exhibit low in one pillar and high in the other. The result gives a direction of causation from social reputation to environmental disclosure, as it has been corrected for the opposite effect.

However, while corporations are confronting the same institutional pressures to adopt the same patterns of legitimate behavior, responses vary across corporations and across institutional fields. This is in line with research which suggests that organizational responses and practices depend on the external institutional environment and the pressures exerted by stakeholders (Delmas & Toffel, 2008; Doh & Guay, 2006; Murillo-Luna et al., 2008). Prosocial orientation, manifested in social reputation, is an inherent unique corporate characteristic which affects current environmental practices, and hence the quality of related disclosures. Communication policy may filter the manifestation of the environmental disclosure, shaping the selection of what is going to be disclosed, but nevertheless the basic force driving environmental disclosures seem to be the aspired social image of the corporation. In addition, firms may choose to disclose more information to enhance their social capital or conform to the behavior of other reputable firms. Our results are important as they establish a relationship between social and environmental responsibility using international data. They complement the current debate which has concentrated predominantly on the relationship between social (e.g, CSR) and economic aspects of sustainability (Harrison and Freeman, 1999; Freeman et al, 2000; Du et al, 2010; Cormier and Magnan, 2013). The results of this chapter are robust to the potential existence of endogeneity between prosocial reputation and environmental disclosure, and to firm-related control variables, such as the level of cash availability (slack), the age of the firm, the size and the ROA.

Further, national context factors are shown to be relevant in explaining the observed levels of firm-level environmental disclosure. Specifically, the results show the following: (1) The country environmental performance index (EPI), which reflects the environmental

policies advanced by a country, has a significant positive effect on a firm's level of environmental disclosure. It appears that firms operating in countries that exhibit greater environmental awareness and pro-environmental policies tend to disclose more information regarding their environmental practices. (2) The openness of the economy also has a significant positive effect on environmental disclosure. Firms operating in open economies are amenable to international pressures concerning compliance with environmental standards and reporting, and thus exhibit higher levels of environmental disclosure. (3) The regulatory quality index positively affects environmental disclosure, suggesting that a national context with quality regulation influences firm behavior towards sustainability, hence increasing the amount of information disclosed. (4). The corruption index is positively associated with disclosure. This result suggests that in countries with higher levels of the index (which means less corruption), firms disclose more information, thus promoting an environment of increased transparency.

At a theoretical level the results demonstrate the importance of the institutional context in driving environmental practices and hence the quality of environmental disclosure. They suggest that country sustainability policies, international exposure and law enforcement are significant determinants of firm environmental conduct and disclosure. From a first point of view, these results are in line with institutional theory, suggesting that firms conform to institutional pressures, seeking legitimacy and acceptance by external constituencies (DiMaggio & Powell, 1983; Marquis, Glynn, & Davis, 2007; Meyer & Rowan, 1977; Oliver, 1991; Scott, 1987). Policies, rules and norms advanced by national institutions exert pressures for firm compliance. In part these pressures may portray coercive characteristics, being enforced by compulsory laws and regulations. Also in another part they can be normative and voluntary. Compliance with the coercive pressures can also vary across corporations and countries, to the extent that they are bypassed by symbolic compliance and decoupling, i.e. when the firm is portraying itself as complying while in practice conducting business in different ways. Other pressures may work by voluntary mechanisms, such as through peer pressure and best practice adoption and diffusion. For instance the adoption of sustainability reporting standards,

certifications, and practices may fall in this category, giving rise to competitive and normative isomorphism (DiMaggio & Powell, 1983). These types of compliance are present behind all national factors examined, being linked with aspects of national sustainability policies, openness to international trade, corruption and regulatory policies. So results demonstrate the relevance of institutional ideas such as legitimacy and isomorphism in corporate environmental disclosure practices. This has also important policy implications supporting the role of national policies. At the same time results suggest variations across firms with firm characteristics being more significant. So the social character of the firm and other firm characteristics such as size, age, slack and profitability are important.

Admittedly, indicators of environmental disclosure, such as those of ASSET4, can provide a good indication regarding the environmental performance of the firm. At the same time some firms may disclose less, either because they have something to hide (see e.g. Ribando & Bonne (2010), for the ASSET4 data), or as deliberate communication strategy (Crane & Glozer, 2016). As Dhaliwal et al (2011) show, firms with higher CSR performance have the inclination to disclose publicly their CSR-related activities and in this way become more transparent to the investors community. However symbolic compliance and some type of “green washing” may, to an extent, take place (Christensen et al, 2013; Walker and Wan, 2012; Wagner et al, 2009; Laufer, 2003), despite the fact that it may be detected and discounted by the market. Firms’ symbolic actions deviating from actual implementation of environmental policies usually take the form of general statements and rhetoric that may not seriously affect aggregate evaluations such as those of ASSET4, which rely on multiple, mostly quantitative items. This issue, however, is open to further investigation and opens an avenue for further research into the composition of disclosure indices and their possible manipulation by firms in their drive to manage social impressions (Desai, 2014; Neu et al, 1998).

The findings of this study bring in the literature strong international evidence towards a positive causality relationship between prosocial corporate behavior (as mirrored in social

reputation) and pro-environmental behavior (as indicated by disclosure). Both are pillars of corporate reputation and sustainability. Previous efforts reveal a positive relationship between environmental performance and corporate reputation, either social reputation or general reputation (Brown, Ronald P. Guidry, et al., 2009; Cho, Guidry, Hageman, & Patten, 2012; Cormier & Magnan, 2015; Huang & Kung, 2010; Toms, 2002). Here we focus on the effect of prior social reputation accumulated by the firm through time as an asset stock which affects its current environmental disclosure. More work has to be done in exploring the relationships among pillars of sustainability, such as more specific social and environmental aspects and disaggregate indices (Van Aaken et al., 2013). Also more work with diverse data sets is needed to account for institutional factors. Particularly because most previous studies have attempted to explore the aforementioned relationships, using datasets which concentrate only on the U.S. market or on a limited number of countries. Seldom national-context factors from other countries have been considered in explaining the observed environment disclosure– social reputation relations. The sample utilized in this chapter is much more diverse in terms of firms and countries covered and also much longer in terms of the time period examined.

In terms of methodology, the adoption of panel data estimation techniques in a large data base such as ASSET4 provides more robust results. The use of the GMM-IV estimation framework adopted in this chapter enables us to examine causality relationships over time among environmental disclosure and social reputation and other drivers. In addition, this framework allows us to control for the existence of potential endogeneity, which if not accommodated can lead to biased estimations and inferences. This is a missing point in most of the previous studies on the issue.

Thus, the degree of environmental disclosure a firm exhibits depends in a positive way on a number of firm-specific and national-context factors such as: social reputation, availability of cash (slack), age, size, ROA and the following characteristics of the host country: national public environmental policies, openness of the economy, corruption level and regulatory quality. Future research based on such international databases would

consider more disaggregated indicators, e.g. separate dimensions of reputation, to show which dimensions count on the environmental performance and disclosure practices of the firm. Also more fine grained national context indicators can be used. It would also be interesting to separate items which may be more amenable to manipulation by firms in their desire to manage public impressions. This would help to focus on those more accurately reflecting the actual business conduct, hence supporting the drive for corporate transparency.

**Table 1.1: Explanatory variables of environmental disclosure**

| Types of variables            | Description   | Expected Sign |
|-------------------------------|---|---------------|
| <b>Dependent variable</b>     | <i>Environmental disclosure score</i> : The number of the environmental indicators ASSET4 database has collected over the total number of environmental indicators ASSET4 collects for each firm.   |               |
| <b>Reputation</b>             | <i>Social score</i> : The social pillar score, assigned by ASSET4 to each firm in the sample, measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.     | +             |
| <b>Firm-specific factors</b>  | <i>Cash and cash equivalents (financial slack)</i> : This is an item of Worldscope database (WC02005) which accounts for cash and due from banks for banks in the sample, cash for insurance companies in the sample and cash and short term investments for all other industries in the sample.  | +             |
|                               | <i>Age</i> : The number of years the firm operates as reported in Datastream.   | +             |
|                               | <i>Size</i> : The number of firm's employees as reported in Datastream.   | +             |
|                               | <i>Return on assets (ROA)</i> : The ratio of net income over total assets. It is used as an indication of firm's profitability.   | +             |
| <b>Country factors</b>        | <i>Environmental performance index (EPI)</i> : This is an index published by Yale University representing the overall environmental performance of a country.   | +             |
|                               | <i>Openness ((imports+exports)/GDP)</i> : This is the ratio of the summation of imports and exports over the total GDP of a country's economy. It is used as a measure of an economy's openness and international trade.  | +             |
|                               | <i>Corruption</i> : This is an index, published by World Bank, which reflects perceptions of the extent to which public power is exercised for private gain including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Higher values of the index indicate lower corruption.  | +             |
|                               | <i>Regulatory quality</i> : This is an index, published by World Bank, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Higher values of the index indicate higher regulatory quality.   | +             |
| <b>Instrumental variables</b> | <i>Board function score</i> : The board of directors/board functions category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to board activities and functions. It reflects a company's capacity to have an effective board by setting up the essential board committees with allocated tasks and responsibilities.                                 | +             |
|                               | <i>Board structure score</i> : The board of directors/board structure category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to a well balanced membership of the board. It reflects a company's capacity to ensure a critical exchange of ideas and an independent decision-making process through an experienced, diverse and independent board. | +             |

**Notes:** This table lists all the explanatory variables examined in this chapter as possible determinants of the environmental disclosure. The column "Expected Sign" refers to the a priori theoretical sign of the explanatory variable.

**Table 1.2: Sample distribution of firm-year observations across industries, years and countries**

| <b>Panel A: Sample distribution across sectors</b> |                     |  |  |
|--|---------------------|--|--|
| <b>Industry categories</b>                         | <b>Observations</b> |  |  |
| Basic materials                                    | 2,022               |  |  |
| Consumer goods                                     | 2,677               |  |  |
| Consumer service                                   | 3,475               |  |  |
| Financials   | 4,364               |  |  |
| Healthcare   | 1,237               |  |  |
| Industrials  | 4,068               |  |  |
| Oil & Gas  | 1,531               |  |  |
| Technology   | 1,941               |  |  |
| Telecommunications                                 | 431                 |  |  |
| Utilities  | 1,038               |  |  |
| <b>Total</b>                                       | <b>22,784</b>       |  |  |

| <b>Panel B: Sample distribution across years</b> |                     |
|--|---------------------|
| <b>Year</b>                                      | <b>Observations</b> |
| 2002   | 866                 |
| 2003   | 875                 |
| 2004   | 1,680               |
| 2005   | 2,067               |
| 2006   | 2,078               |
| 2007   | 2,202               |
| 2008   | 2,523               |
| 2009   | 2,838               |
| 2010   | 2,923               |
| 2011   | 2,712               |
| 2012   | 2,020               |
| <b>Total</b>                                     | <b>22,784</b>       |

| <b>Panel C: Sample distribution across countries</b> |                     |                |                     |
|--|---------------------|----------------|---------------------|
| <b>Country</b>                                       | <b>Observations</b> | <b>Country</b> | <b>Observations</b> |
| Australia  | 1,482               | Italy          | 493                 |
| Austria  | 165                 | Japan          | 3,436               |
| Belgium  | 222                 | Netherlands    | 305                 |
| Brazil   | 157                 | Norway         | 209                 |
| Canada   | 1,554               | Portugal       | 102                 |
| China  | 214                 | Singapore      | 337                 |
| Denmark  | 185                 | Spain          | 406                 |
| Finland  | 233                 | Sweden         | 569                 |
| France   | 926                 | UK             | 2,884               |
| Germany  | 668                 | US             | 7,639               |
| HongKong   | 598                 |                |                     |
| <b>Total</b>   |                     |                | <b>22,784</b>       |

**Table 1.3: Descriptive Statistics**

|  | Observations | Mean     | Median   | Minimum | Maximum   | Standard Deviation | Skewness | Kurtosis |
|--|--------------|----------|----------|---------|-----------|--------------------|----------|----------|
| <b>Environmental disclosure score (%)</b>    | 22,784       | 47.82    | 42.13    | 39.13   | 95.65     | 11.86              | 1.25     | 3.56     |
| <b>Social score (%)</b>                      | 22,187       | 50.59    | 49.83    | 3.37    | 98.95     | 30.77              | 0.04     | 1.54     |
| <b>Slack (in \$)</b>                         | 32,720       | 3.31E+07 | 458615.5 | 99      | 1.23E+10  | 2.71E+08           | 24.28    | 749.09   |
| <b>Age (in years)</b>                        | 33,363       | 19.34    | 17       | 1       | 48        | 12.36              | 0.25     | 1.78     |
| <b>Size (employees)</b>                      | 29,618       | 26,097   | 8,036    | 15      | 2,200,000 | 63,761.53          | 12.84    | 335.05   |
| <b>ROA score (%)</b>                         | 20,590       | 49.05    | 46.05    | 0       | 100       | 21.61              | 0.28     | 2.84     |
| <b>Environmental performance index (%)</b>   | 35,365       | 59.83    | 56.9     | 41.9    | 70.3      | 5.49               | -0.02    | 3.38     |
| <b>Openness: [(imports + exports) / GDP]</b> | 35,365       | 0.49     | 0.26     | 0.05    | 3.68      | 0.68               | 3.60     | 15.19    |
| <b>Corruption (index points)</b>             | 35,365       | 1.57     | 1.6      | -0.65   | 2.55      | 0.52               | -1.71    | 7.60     |
| <b>Regulatory quality (index points)</b>     | 35,365       | 1.44     | 1.57     | -0.53   | 2         | 0.38               | -2.29    | 9.81     |

**Notes:** Min and max are the minimum and maximum values of the sample data, respectively. Skewness and kurtosis are the estimated centralized third and fourth moments of the data. See also table 1.1 for definitions of variables. All variables are winsorized at 1<sup>st</sup> and 99<sup>th</sup> percentiles.



**Table 1.4: Correlation matrix of variables**

|    |                                      | 1           | 2    | 3     | 4     | 5      | 6     | 7     | 8     | 9           | 10   | 11          | 12 |
|----|--------------------------------------|-------------|------|-------|-------|--------|-------|-------|-------|-------------|------|-------------|----|
| 1  | Environmental disclosure score       | 1           |      |       |       |        |       |       |       |             |      |             |    |
| 2  | Social score <sub>t-2</sub>          | <b>0.61</b> | 1    |       |       |        |       |       |       |             |      |             |    |
| 3  | Slack                                | 0.26        | 0.14 | 1     |       |        |       |       |       |             |      |             |    |
| 4  | Age                                  | 0.20        | 0.15 | 0.19  | 1     |        |       |       |       |             |      |             |    |
| 5  | Size                                 | 0.30        | 0.46 | 0.37  | 0.23  | 1      |       |       |       |             |      |             |    |
| 6  | ROA                                  | -0.01       | 0.03 | -0.19 | -0.07 | -0.01  | 1     |       |       |             |      |             |    |
| 7  | Environmental performance index      | 0.25        | 0.23 | 0.02  | 0.01  | -0.07  | -0.06 | 1     |       |             |      |             |    |
| 8  | Openness                             | 0.07        | 0.09 | -0.11 | -0.08 | -0.04  | 0.03  | 0.26  | 1     |             |      |             |    |
| 9  | Corruption                           | -0.01       | 0.03 | -0.18 | 0.01  | -0.12  | 0.08  | 0.25  | 0.34  | 1           |      |             |    |
| 10 | Regulatory quality                   | -0.14       | 0.01 | -0.52 | -0.01 | -0.14  | 0.17  | 0.08  | 0.21  | <b>0.73</b> | 1    |             |    |
| 11 | Board function score <sub>t-2</sub>  | -0.12       | 0.06 | -0.44 | -0.01 | 0.03   | 0.14  | -0.42 | -0.12 | 0.06        | 0.46 | 1           |    |
| 12 | Board structure score <sub>t-2</sub> | -0.14       | 0.05 | -0.46 | 0.002 | -0.004 | 0.18  | -0.38 | -0.12 | 0.12        | 0.49 | <b>0.79</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold.



**Table 1.5: Panel Regressions and two-step GMM regressions**

|   | (1)   | (2)                                       | (3)  |
|---|---|---|--|
| <b>Estimation method – Dependent variable:</b>                          | <b>Fixed effects -<br/>environmental disclosure<br/>score</b> | <b>First stage GMM -<br/>social Score</b> | <b>Second stage GMM –<br/>environmental<br/>disclosure score</b> |
| <b>Constant</b>   | -0.5641*<br>(-1.82)   | 13.5692<br>(0.27)                         | -0.6299***<br>(-2.80)  |
| <b>Social score<sub>t-2</sub> (+)</b>                                   | 0.0017***<br>(8.25)   | -   | 0.0027***<br>(7.27)  |
| <b>Board function score<sub>t-2</sub> (+)</b>                           | -   | 0.1181***<br>(6.49)                       | -  |
| <b>Board structure score<sub>t-2</sub> (+)</b>                          | -   | 0.0894***<br>(5.36)                       | -  |
| <b>Control Variables</b>  |   |   |  |
| <b>Slack (+)</b>  | 0.0066***<br>(7.45)   | 2.2743***<br>(8.20)                       | 0.0049***<br>(3.90)  |
| <b>Age (+)</b>  | 0.0008***<br>(6.37)   | 0.1881***<br>(4.98)                       | 0.0007***<br>(4.56)  |
| <b>Size (+)</b>   | 0.0054***<br>(4.88)   | 7.5204***<br>(23.16)                      | -0.0022<br>(-0.72)   |
| <b>ROA (+)</b>  | 0.0001***<br>(2.65)   | 0.0578***<br>(3.81)                       | 0.0006<br>(1.07)   |
| <b>Country Variables</b>  |   |   |  |
| <b>Environmental performance index (+)</b>                              | 0.0135***<br>(2.59)   | -0.7424<br>(-0.85)                        | 0.0154***<br>(3.96)  |
| <b>Openness (+)</b>   | 0.0514<br>(1.57)  | -14.2925***<br>(-2.53)                    | 0.0748***<br>(2.79)  |
| <b>Corruption (+)</b>   | 0.0198<br>(1.04)  | -6.9362***<br>(-3.64)                     | 0.0348***<br>(4.32)  |
| <b>Industry Dummies</b>   | Yes   | Yes                                       | Yes  |
| <b>Country Dummies</b>  | Yes   | Yes                                       | Yes  |
| <b>Year Dummies</b>   | Yes   | Yes                                       | Yes  |
| <b>Firm Clusters</b>  | 2,687   | 2,687                                     | 2,687  |
| <b>Time Clusters</b>  | 9   | 9   | 9  |
| <b>Observations</b>   | 13,074  | 13,074                                    | 13,074   |
| <b>Adjusted / Centered R<sup>2</sup></b>                                | 52.16%  | 42.17%                                    | 53.49%   |
| <b>F-stat</b>   | 353.29  | 98.24                                     | 78.63  |
| <b>[p-value]</b>  | [0.0000]  | [0.0000]                                  | [0.0000]   |
| <b>Hausman test (re vs. fe)</b>   | 1,608.94  | -   | -  |
| <b>[p-value]</b>  | [0.0000]  | -   | -  |
| <b>F-stat (firm fe vs. pooled ols)</b>                                  | 14.64   | -   | -  |
| <b>[p-value]</b>  | [0.0000]  | -   | -  |
| <b>F-stat (time fe vs. pooled ols)</b>                                  | 45.34   | -   | -  |
| <b>[p-value]</b>  | [0.0000]  | -   | -  |
| <b>Angrist-Pischke test ~ chi<sup>2</sup></b>                           | -   | 94.27                                     | -  |
| <b>[p-value]</b>  | -   | [0.0000]                                  | -  |
| <b>Underidentification Kleibergen- Paaprk LM test ~ chi<sup>2</sup></b> | -   | -   | 81.73  |
| <b>[p-value]</b>  | -   | -   | [0.0000]   |
| <b>Underidentification Kleibergen-Paaprk Wald F-stat</b>                | -   | -   | 46.95  |
| <b>Weak identification Cragg-Donald Wald F-stat</b>                     | -   | -   | 105.63   |
| <b>Hansen J (overidentification test)</b>                               | -   | -   | 0.80   |
| <b>[p-value]</b>  | -   | -   | [0.3712]   |

**Notes:** T-statistics are reported in parentheses below the estimated coefficients. Statistical significance of the estimated coefficients is denoted with \*, \*\* and \*\*\* for 10%, 5% and 1% significance levels, respectively. Column 1 reports the most parsimonious panel data regression with fixed effects for industry, country and year. Columns 2 and 3 report the results for the first and second stage results of the two-step GMM efficient estimator, respectively. Standard errors reported in column 1 are two-way cluster-adjusted as described in Petersen (2009) and for columns 2 and 3 are firm cluster-adjusted. Log stands for the natural logarithm. Cragg-Donald and Kleibergen-Paaprk Wald F-stat are compared with the Stock & Yogo(2005) critical values and since they are far larger than the critical value of 19.93 for the 10% significance level (the typical rule of thumb is to use a value equal to 20) they strongly reject the null hypothesis of weak identification. Hansen J-stat tests for the overidentification of the estimated GMM model and does not reject the null hypothesis of exogeneity for the instruments used. The coefficients for the industry, country and year dummies are suppressed



## **Chapter 2: Imitative environmental strategies: An integrated institutional-generic strategies perspective**

### **2.1 Abstract**

This chapter investigates mechanisms at work with respect to the imitative environmental responsibility strategies, integrating the imitative isomorphism and generic strategies perspectives. It proposes as a benchmark for imitative isomorphism the environmental social performance (ESP) of the strategy leaders in the particular generic strategy group to which a firm belongs. It assumes that competitive advantage is the driving force of environmental practices imitation for firms lagging in ESP in comparison to the respective strategy leaders. Under this view the firm first identifies the strategy leaders and then it compares its own environmental practices with those of the leader identifying gaps. Results show that firms imitate the ESP of the cost leader in their strategic group, across all strategic groups, i.e. groups with cost and middle cost orientation. As regards differentiation, imitation of the ESP of the strategy leader appears to occur only in the high-differentiation group. Country conditions as expressed by indicators of regulatory quality and law enforcement affect ESP only in low – cost and middle - cost groups, providing evidence of coercive isomorphism in these groups. Firms oriented towards differentiation are not affected by these country variables. Theoretical implications are discussed as the findings link institutional theory with competitive strategy.



## 2.2 Introduction

During last decades firms increasingly engage in practices related to environmental social responsibility. This is documented by the unprecedented proliferation of such activities spread across firms and countries. Regardless of motive, firms adopt environmental technologies and initiatives to reduce their ecological footprint, save resources (e.g. reduce, replace, recycle - RRR) and transform processes and products to be friendlier to the environment (Dunphy, Griffiths, & Benn, 2007; Escobar & Vredenburg, 2011; Pless, Maak, & Waldman, 2012; Shrivastava, 1995). However, it is not clear yet in which ways firms decide which practices to adopt and if their search procedures to do so are driven by their local or distant context (Chandler & Hwang, 2015; March, 2010). For example, institutional theorists have proposed as driving forces of firms' decisions regarding environmental responsibility, the potential conformity pressures exerted by regulators and the institutional business environment, and the competitive imitation among firms in their effort to achieve competitive edge. Such pressures lead firms to adopt socially desirable practices advanced by other firms in the market (Delmas & Toffel, 2008; DiMaggio & Powell, 1983; Scott, 1987). Indeed, imitation has been found to be a significant driver of organizational learning (Argote, 1999) and mimetic isomorphism has been showed to be influential in disseminating environmental practices (Escobar & Vredenburg, 2011).

According to mimetic isomorphism firms search for practices employed by leading strategy competitors and adopt them in their own operations in order to stay in parity with competition. However, different types of mimetic isomorphism can arise, depending on which benchmark firms identify in their competitive environment and whether they imitate the environmental practices of these firms, or attempt to move beyond them. In other words firms search for credible benchmarks in order to direct their imitation and select practices for adoption, or expand their environmental activities to areas beyond the ESP of the strategy leaders out of altruism or in order to create competitive advantage. Two important questions in imitative behavior are first whom and how much to imitate (Brouthers, O'Donnell, & Hadjimarcou, 2005), and second to lag or exceed the

strategy leader. However, the theory of mimetic isomorphism does not provide clear answers to these questions and the specific mechanisms utilized by firms to direct their mimetic processes (Brouthers et al., 2005; Chandler & Hwang, 2015).

From a competitive advantage perspective, the firm is searching for cues or signals in the business decisions of its rivals, trying to interpret their actions and finally to choose which practices to adopt in order to achieve or maintain competitive parity (Chandler & Hwang, 2015). A rational approach to this search procedure is to imitate firms which achieve the best outcomes, i.e. firms that outperform others. Indeed, “imitate the successful” has been recognized as a heuristic in the behavior of organizations (Haunschild & Miner, 1997; Haveman, 1993). This behavior economizes decision making costs, as the firm limits its spectrum of alternatives and focuses on actions or practices of the most successful competitors. Further, a firm may often postpone internally produced proposals based on sound analysis until sensing that its major competitors are making the first move (Vermeulen & Curseu, 2010). In this way, firms have the motive to seek legitimacy by mimicking successful firms within a group of firms exhibiting similar or comparable generic business strategy. In other words, legitimacy is subject to the competitive advantage imperative. As suggested by (Posen, Lee, & Yi, 2013) firms attempt to imitate market leaders within their own strategic group. Thus, firms adopting practices from the leaders within their strategic group who have demonstrated increasing firm performance, exhibit an instrumental view of environmental responsibility. This is fundamentally guided by strategic advantage and competitiveness. Put differently, strategies chosen by the most successful firms within firm’s sector and strategic group would provide implicit assurances of being worth pursuing.

The search for successful rivals to compare with can be based on strategic proximity, i.e. firms in the same industry, which exhibit similar competitive strategies, typically one out of cost or differentiation leadership. Despite their apparent relevance, mimetic mechanisms based on competitive strategy have not been considered so far in the mimetic isomorphism theory (Chandler & Hwang, 2015). However, the existence of

strategy-based mechanisms in the imitation of environmental practices within a firm's strategic group is an open question for the literature. Theoretically, this research question links institutional theory and learning with the competitive strategy perspective and provides an appropriate framework to test which specific mechanisms drive mimetic isomorphism and how firms apply them.

The present study examines empirically the relevance of strategy-based mechanisms for environmental imitation across a large sample of firms in an international sample of countries. This is achieved by testing the hypothesis that the focal firm identifies the best performing firm within its strategic group - in terms of cost leadership, differentiation or hybrid strategies - and then it imitates its environmental practices. It assumes that the best performing rivals have identified a mix of environmental practices that bundled with other resources and capabilities produce better outcomes and lead to a competitive advantage. In this way, this chapter departs from previous studies focusing on the direct adoption of similar environmental practices as a result of external pressures. Instead this chapter focuses on the imitation of relevant business strategies, as they are implemented by a bundle of practices and capabilities including environmental components in the total set. The link between environmental practices and business-level strategy has been proposed by several studies in terms of imitating environmental strategies or adopting environmental technologies (Escobar & Vredenburg, 2011; Hart, 1995; Kitzmueller & Shimshack, 2012; McWilliams & Siegel, 2011; Shrivastava, 1995), but no specific mechanisms have been identified in a framework of generic strategies and competitive isomorphism (Chandler & Hwang, 2015).

According to the institutional theory, firms operate in broader social structures, comprised by national and international regulations or different institutions, which may affect firm CSR behavior and hence ESP performance (Campbell, 2007; Campbell, Hollingsworth, & Lindberg, 1991). Such institutional differences may affect the level of adoption of CSR related activities (Ball & Craig, 2010; Hall & Soskice, 2001) creating a variation of CSR activities across countries (Ioannou & Serafeim, 2012; Maignan & Ralston,

2002). However, there is a need for a more focused examination of national institutional factors and their relationship with the strategic behavior of firms. Institutional factors such as regulatory quality and law enforcement may be more relevant for firms competing on low-cost strategies rather than for firms adopting a differentiation strategy. This is due to the fact that low-cost strategies are likely to be affected more by complying to strict limits set by environmental regulations. Firms with cost-leadership orientation apply cost reduction practices in order to sustain competitive parity with cost leaders, while differentiation strategy firms probably act beyond regulatory compliance limits, creating a buffer zone against accidental violation preempting regulatory investigations and taking advantage of environmentally induced innovations (Kitzmueller & Shimshack, 2012). Thus, such institutional country factors may affect a firm's environmental practices, according to its competitive strategy.

Firm specific characteristics such as corporate social reputation, size, age, and financial performance have been showed to be important as well (Clarkson et al., 2008; Guidry & Patten, 2012; Halme & Huse, 1997; Patten, 2002). Specifically, corporate social reputation, as an asset stock built over the history of the firm (Dierickx & Cool, 1989) has an expected dynamic endogenous relationship with environmental performance. This is due to the fact that reputable firms tend to increase environmental activities in order to increase their social legitimacy and credibility in the market while at the same time a part of the already built social reputation may be attributed to previous investments in sustainability. This chapter takes the potential presence of dynamic endogeneity into account and estimates the net effect of the lagged social score on ESP. Moreover, size and age variables are indicators of higher social visibility of a firm and may affect its environmental performance. Corporate financial performance, representing the slack resources may be used for environmental initiatives (Belkaoui & Karpik, 1989; Perrini & Minoja, 2007), and thus may affect environmental performance. Such control factors are expected to drive firm specific heterogeneity and as such run contrary to the convergence pressures of imitative and coercive isomorphism.

The chapter utilizes a rich panel data set of published international data from several well-known sources. This enables estimation across countries and sectors, allowing the role of national factors to be considered along with other firm and sector specific variables. These secondary data are objective, in the sense that they are collected by a third party, the Thomson Reuters ASSET4 database. Further, the data collected are retrieved from information disclosed by firms in annual reports, websites and press releases, or produced by credible international organizations, such as the World Bank. The results are generalized to an international setting, and can be reproduced. Specifically the chapter utilizes an international sample comprising 3,238 firms hosted in 39 countries over the 2002-2012 period. This rich data set enables us to utilize panel data estimation methodologies and to take into account potential endogeneity.

This chapter contributes to the existing literature on the topic of environmental behavior of firms. First, it examines specific competitive imitation mechanisms based on business strategy indicators. In this way, it links institutional theory with business strategy. To the best of our knowledge, no other study has explicitly examined the existence of strategy-based environmental imitative isomorphism. As such, it provides a partial empirical test to the theory proposed by (Chandler & Hwang, 2015). Second, it tests the effect of selected national factors on the environmental behavior of different strategic groups. Thus, it links the general social coercive pressures with competitive strategy. Third, it compares the explanatory power of firm specific non-isomorphic factors as opposed to factors of isomorphism providing evidence for assessing the relative importance of converging and diverging processes.

## **2.3 Theoretical framework and hypotheses development**

### *2.3.1 Competitive Isomorphism*

Mimetic or competitive isomorphism can arise in several occasions, since firms competing in the market adopt the practices of their successful competitors or attempt to resemble

other firms within their economic and social environment (DiMaggio & Powell, 1983; Oliver, 1991). Imitation effects are often among firms to avoid falling behind their competitors and because senior managers may believe that others' practices convey useful information (Lieberman & Asaba, 2006). The imitation of other companies is typically voluntary, as firms seek the best practices to imitate giving rise to competitive isomorphism. The imitation observed in the markets can be coercive and normative, when firms adhere to industry and peer pressures to adopt standards and practices considered as compulsory or legitimate in the sector. For instance, pursuing environmentally related certifications and adopting sustainability reporting standards may fall in this category. So a process of isomorphism takes place, reducing the heterogeneity among firms' practices.

In turn, imitative behavior can be a result of rational choice, as firms strive to reduce uncertainty and economize on problem solving resources. As Cyert & March (1963) suggest, when faced with uncertainty, firms can economize on search and analysis costs by replicating decisions made or practices followed by other firms. Under conditions of uncertainty firms may be unable to assess the possible outcomes, so they resort to imitation (Lieberman & Asaba, 2006). Mimicking practices which led to positive outcomes in other organizations allows the firm to benefit from the collective experience accumulated in the market. Imitating the dominant practices of the most successful firms in a given sector would help to legitimize the adoption decision. However, two critical decisions have to be made: first which firm (or firms) are the potential candidates in searching for good practices, and second which practices of these firms to adopt. This is a critical and difficult task, as the number of best practices can be large and require other complementary resources and capabilities to be applied in practice (Barney, 1991; Bromiley & Rau, 2014; Posen et al., 2013). Specifying a decision-making process for the selection of the best practices, institutional theory suggests that firms should be conforming to the dominant practices within their field (DiMaggio & Powell, 1983; Scott, 1987). However, the theory does not provide specific suggestions as to guide the search and adoption decisions (Chandler & Hwang, 2015). Also, it does not explain when a firm

seizes to adopt practices, and turns to taking initiatives and producing their own innovations to exceed the strategy leaders.

Generic strategies (Porter, 1980) can provide a basis for the search of best practices as firms are more likely to seek more focused and intuitive comparisons against their best performing competitors or the “leaders” within their strategic group. For instance, a firm with low cost strategy orientation may compare itself with the firm being the cost leader and search for its best practices. Similarly, within a differentiation group a firm may compare itself with the top differentiator firm. Further, imitation is likely to be observed towards the best performing firm. Firms are likely to search for cues or signals transmitted by competitors about the leader’s best practices (Oliver, 1991; Robinson et al., 2011). Sets of indicator variables related to the generic business strategies can be utilized as a guide to create groups of firms, for e.g. cost indicators for cost leadership; R&D for innovation differentiation; marketing and advertising as marketing differentiation. Further, a more focused investigation within the specific group to which the firm belongs appears to be more promising as structural barriers may constrain the mobility between groups (Caves & Porter, 1977) and limit the investigation (Cyert & March, 1963). Following the above rationale the following proposition can be advanced:

*Proposition 1: Firms tend to imitate most successful competitors within their strategic group.*

On the basis of this proposition we can formulate a set of hypotheses about the imitative and coercive conformity with respect to environmental practices. Such practices constitute part of the total bundle of sustainability practices that leaders in the group adopt. The leader is perceived to have the best combination of practices and related capabilities, proven by its competitive advantage superiority. So the adopted practices are legitimized following the success of the leader and inferred by its ability to sustain a superior competitive posture.

It is widely accepted that a strategy of cost leadership or differentiation produces better outcomes (Porter, 1980; Thornhill & White, 2007). This can be further classified to high, middle level groups in each strategic characteristic, provided that the comparison is against the leader within each group, for e.g. a low cost orientation is identified when firms exhibit a relatively high price-to-cost margin ratio in their respective group. This provides a practical form of the notion of “parity” being expressed within each group by the firm with the lower cost. According to institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1987) , the practices of these firms may express legitimate imitation targets, as they are applied by the most competitive firm in the specific group. Legitimacy follows from the strategy related performance expectations.

The definition of distinct cut-off borders in defining different groups within each strategy forms a controversial issue. (Caves & Porter, 1977) propose the existence of structural barriers that “fence” each group, limiting the ability of firms to move from one group to another. However, defining clear borders remains a challenge, as they depend on the perceived view of the firm regarding its strategy, the competitors and the leader in its own strategic group. Taking into account this issue, we utilize alternative cut-off thresholds when grouping the firms examined. Specifically, we group the examined firms in quartiles and deciles according to their business strategy indicator variable, leading to high, and middle of cost leaders and differentiators. Following the above discussion, the following hypotheses are advanced for firms lagging their respective strategic leader as regards ESP with respect to strategy based groups:

*H1: The greater the distance of the environmental practices of a firm from the environmental practices of the cost leader in its specific cost-related strategic group, the higher its environmental performance.*

*H2: The greater the distance of the environmental practices of a firm from the environmental practices of the top differentiator in its specific differentiation-related strategic group, the higher its environmental performance.*

### 2.3.2 Country effects

According to institutional theory, country level effects impose coercive and normative pressures that push firms to adopt practices considered as compulsory. Regulatory policies, rules and norms advanced by national institutions, as well as law enforcement in implementing these, exert pressures for firm compliance. Compliance with these portray coercive characteristics (DiMaggio & Powell, 1983), and can affect significantly firms - especially those with a low cost orientation which may be lagging in some costly compliance with the regulations. These firms are assumed to typically comply with the minimum requirements set by regulations in order to maintain low costs. Firms adopting differentiation as their business strategy, are likely to move beyond compliance. They want to enhance the importance of their environmental image perceived by the public in order to create a buffer against public criticism (Baron, 2001), but improved level of environmental performance may also be the result of experience with innovations (Kitzmueller & Shimshack, 2012), triggered by regulatory requirements.

For the reasons discussed above, certain national context factors are examined as possible determinants of the observed differences in levels of environmental performance among firms. These factors account for the *regulatory quality*, the *law enforcement* environmental policies of the country and the *openness of the economy* to international trade. Institutional theory suggests that national environments exhibiting high quality of regulations and law enforcement exert higher pressures on firms to comply. Public policies pushing towards sustainability are likely to push firms to adopt environmental practices regardless of their actual efficiency (DiMaggio & Powell, 1983). Such public policies can be represented by the environmental performance index (EPI) of the country. Finally, high levels of openness of the economy which indicate high trade liberalization, can shape CSR practices of the firms and are expected to enhance levels of environmental performance as social performance is in demand in international trade

(Flammer, 2015). Openness of the economy can be measured by international trade activity over GDP.

From the firms oriented towards low cost some may lag their strategy leaders in ESP. The gap from these leaders may indicate that these firms are behind in certain maybe costly environmental aspects, e.g. costly regulations. These are more likely to be affected by country and international policy pressures. These arguments lead to the following hypotheses:

*H5: For firms oriented to low cost, the higher the indices of regulatory quality, law enforcement, environmental performance and openness of the country the higher the environmental performance of the firm.*

*H6: For firms oriented to differentiation, the higher the indices of regulatory quality, law enforcement, environmental performance and openness of the country the higher the environmental performance of the firm.*

## 2.4 Methods, variables and sample

### 2.4.1 Econometric Model

For each generic strategy group, the following generic panel data regression model is adopted to explain the observed environmental scores at the firm level:

$$y_{it} = \mu + \alpha_i + \alpha_t + \sum_{g=1}^G \beta_{gi} x_{git} + \sum_{k=1}^K \gamma_{ik} z_{kt} + u_i + \varepsilon_{it} \quad (1)$$

$\varepsilon_{it} \sim i.i.d. (0, \sigma_\varepsilon^2)$ ,  $E(u_i) = 0$ ,  $E(u_i^2) = \sigma_u^2$ ,  $E(\varepsilon_{it} u_j) = 0$ , for  $\forall i, t, j$ ;  $E(u_i u_j) = 0$ , if  $i \neq j$

where  $i=1, 2, \dots, n$  identifies the firm;  $t=1, 2, \dots, T$  denotes the year;  $y_{it}$  is the environmental score of firm  $i$  in year  $t$ ;  $x_{git}$  is a matrix of  $G$  explanatory variables that includes controls for the social score, age, size (employees), financial slack (cash reserves over total assets) and firm performance (return on assets);  $z_{kt}$  is a matrix of  $K$  firm-invariant explanatory variables for the country indices used;  $\alpha_i$  and  $\alpha_t$  are constant terms that allow for the possibility of (constant) heterogeneous behaviour between the firms ( $\alpha_i$ ) and over the yearly time periods ( $\alpha_t$ ), respectively;  $\beta_{gi}$  measures the effect that the  $g^{\text{th}}$  explanatory variable has on the environmental score of firm  $i$ ;  $\gamma_{ik}$  estimates the sensitivity of the environmental score of firm  $i$  on the  $k^{\text{th}}$  variable;  $\varepsilon_{it}$  is a white noise error term following a distribution with mean zero and variance  $\sigma_\varepsilon^2$  and represents the within-firm errors; and  $u_i$  represents the between-firm errors.

As the dataset comprises both cross-sectional and time series observations, panel data regressions are adopted to estimate equation (1). To select between the fixed-effects and random-effects specifications of the panel data estimation methods, the (Hausman, 1978) test is conducted to test the null hypothesis that the preferred model is the random effects vs. the alternative of fixed effects model<sup>1</sup>. The performed estimations control for firm, country, industry and year fixed-effects. With respect to the estimation of standard errors, (Petersen, 2009) shows that in panel datasets when estimating fixed effects models, firm or time clustering of standard errors individually may lead to biased standard errors. Avoiding such bias involves the estimation of both firm and time dimensions cluster-adjusted standard errors (see Petersen (2009) and Thompson (2011), which is adopted in the fixed-effects regressions of this chapter.

---

<sup>1</sup>Once selected, the fixed- or random-effects specification is tested against a pooled OLS specification through the following: (1) a separate F-test for the fixed-effects ( $H_0: \alpha_i = 0$ , for  $i=1, \dots, n$ ) and the time-fixed effects ( $H_0: \alpha_t = 0$ , for  $t=1, 2, \dots, T$ ) specifications versus a pooled OLS specification and (2) the (Breusch & Pagan, 1980) Lagrange Multiplier (LM) test for the random-effects versus a pooled OLS specification. The results of these tests are not reported to preserve space but are available from the authors upon request.

#### 2.4.2 Variables

All  $x_{git}$  and  $z_{kt}$  variables in equation (1), their precise definitions, and their a-priori expected signs are presented next and summarized in table 2.1.

**Dependent Variable:** *The environmental score*, defined as the score assigned by ASSET4 to the focal firm for the environmental pillar of its ESG score. **Strategy variables include:** (1) *Distance from cost leader (Env Gap Cost)*, defined as the squared difference of environmental score between the focal firm and the cost leader divided by the environmental score of the cost leader. For each industry-year pair of the sample the cost leader is defined as the firm exhibiting the maximum ratio of cost of goods sold over sales. A positive sign is expected as the greater the distance of environmental score from the cost leader, the higher the inclination for the focal firm to increase its environmental activities. (2) *Distance from differentiation leader (Env Gap R&D Diff)*, defined as the squared difference of environmental score between the focal firm and the differentiation leader divided by the environmental score of the differentiation leader. This R&D expenses/Sales ratio is a proxy for innovative differentiation (McWilliams and Siegel, 2001). In addition, a second *Distance from differentiation leader (Env Gap Markt Diff)* refers to the gap based on the marketing expenses. This Marketing expenses/Sales ratio is a proxy for marketing differentiation (Spanos et al., 2001). For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of R&D expenses over sales. Again, a positive sign is expected as the greater the distance of environmental score from the differentiation leader, the higher the inclination for the focal firm to increase its environmental activities.

**Firm-related factors include:** (1) The *social score*, defined by ASSET4 as a score that “measures” a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. The expected sign is positive because the larger the social score of a firm, the higher its inclination to

environmental performance. (2) The *Age*, defined as the logarithm of the years from the inception of the firm as provided in the firm's financial statements. A positive sign is expected because well-established firms have built reputation and therefore are inclined to more environmental activities. (3) The *size* of the firm, which is represented by number of employees for the firm (in log form). Again, a positive sign is expected because with size firms are expected to be more likely to exhibit higher involvement in environmental practices. (4) The (financial) *slack*, defined as the ratio of cash and cash-equivalent items over total assets from the balance sheet statement of the focal firm. The expected sign is positive, as higher levels of slack are expected to be associated with higher levels of environmental score because the firm has more available resources to allocate for its environmental activities. (5) The *return on assets (ROA)*, defined as net income over total assets. A positive sign is expected because with greater profitability more resources are available to be invested in non-financial reporting activities.

**Country factors:** (1) The *environmental performance index (EPI)*, which reflects the level of firms' environmental practices and awareness within the host country. The expected sign is positive because countries that exhibit higher levels of environmental awareness tend to be host countries for firms that are engaged more in environmental-friendly practices. (2) The *openness ratio* =  $((imports + exports) / GDP)$  is defined as the summation of imports and exports over the GDP of each country in the sample. A positive coefficient of openness is expected because firms operating within countries that exhibit higher levels of trade liberalization tend to adopt CSR practices and non-financial reporting to a greater extent (Flammer, 2015). (3) The *regulatory quality index*, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development in compliance with environmental regulations. A positive sign is expected as higher values of the index indicate higher regulatory quality and thus increase the possibility of higher adoption of environmental practices (4) The *rule of law index*, which captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts,

as well as the likelihood of crime and violence. Again, a positive sign is expected as higher values of the index indicate higher rule of law and thus increase the possibility of higher adoption of environmental practices.

#### *2.4.3 Endogeneity issues*

In the estimation setting of equation (1), endogeneity issues can arise among environmental score and social score (corporate reputation) because of simultaneity bias, reverse causality and omitted variables problem. For this reason, the social score appears in our initial panel data estimations with a two periods lag. In this way, social score is predetermined, and any simultaneity bias is mitigated. Further, the use of fixed effects panel data regressions accounts for the omitted variables issue by introducing country, industry and year dummies.

However, the use of lagged values and the use of fixed effects regressions are not perfect remedies for endogeneity because it may be the case that both environmental performance and corporate reputation are correlated with a third common but omitted variable or exhibit reverse causality. For this reason and due to the possible effect of past environmental performance on reputation, we follow (Surroca, Tribó, & Waddock, 2010) and regress reputation on increasingly higher-order lags of environmental score until no further significant improvement in  $R^2$  was observed (Roberts & Dowling, 2002). There are no significant increases in  $R^2$  beyond two lags. Thus, we calculate the residual of social score as the difference between social score and the predicted value found in a specification of environmental that included up to two lags of that variable. This residual lagged by two periods is our measure of reputation and enters our estimations.

#### *2.4.4 Data and sample*

The main source of the panel data set used in this chapter is the Thomson Reuters ASSET4 database, which provides environmental, social and corporate governance data (ESG) for over 4,000 firms worldwide, starting in 2002. The main clients of ASSET4 ESG scores are professional investors seeking to integrate ESG data into their portfolio investment analysis. Thomson Reuters assigns trained research analysts to collect more than 900 evaluation points for each firm under the requirement that all of the data incorporated into the evaluation points are publicly available. However, the resulting ESG evaluation points do not share the same standardization worldwide, even if there are efforts towards this direction – see, e.g., the recent proposal for the EU Directive (2014) focusing on non-financial reporting. Due to this lack of common standards and to enable comparability of the collected data, ASSET4 incorporates the collected evaluation points into consistent ESG scores to enable quantitative analysis and comprehensive comparisons. For example, the environmental evaluation points typically include information on energy used, water recycled, carbon emissions, waste recycled, and pollution. Subsequently, every year the 900 evaluation points are used as inputs to a specific weighted formula to calculate 250 key performance indicators (KPI's), which are further classified into 18 categories within four pillars: environmental, social, corporate governance and economics. According to ASSET4's documentation, in a given year, each firm receives a z-score for each of the four pillars. This z-score represents a firm's relative ranking against the other firms based on the information available until the previous year.

We start with the universe of ASSET4's database, which comprises 60 countries and a total of 4,521 firms during the 2002-2013 period. However, after excluding firm without available data for environmental score, the main variable of this chapter our sample deteriorates to 46 countries which account for 3,221 firms. The final sample of countries covers the great majority of the developed and emerging economies around the globe. Firm-wise, the sample utilized in this chapter covers 71.24% of the total available firms in the ASSET4 database. In terms of number of observations, the starting panel data set comprises 55,296 firm-year observations and the final sample comprises 21,207 firm-year

observations. This is due to a considerable number of missing values for some of the variables used which limits the available observations for estimation purposes. Thus, our final sample comprises an unbalanced panel data set.

This dataset is subsequently matched with firm-level data provided by ASSET4, Datastream and WorldScope databases on the social score (reputation), the firm age, the number of employees, the ratio of the item cash and cash equivalents from the WorldScope database (item WC02005) over the item total assets (WC02999) is to account for firms' financial *slack* and the ratio of EBITDA (item WC18198) over total assets (item WC02999) to compute the return on assets (firm performance). The sector classification follows the industry classification benchmark (ICB) provided by the WorldScope database (item WC07040). The first level of ICB classification is used, which comprises the following broad sectors: basic materials, consumer goods, consumer services, financials, healthcare, industrials, oil and gas, technology, telecommunications and utilities.

To account for national context factors, which may affect environmental scores at the firm level, we introduce a set of country indices, notably the following: the environmental performance index (EPI), which is published by Yale University<sup>2</sup>; the level of openness of the economy, defined as the ratio of ((imports + exports) / GDP), computed with data obtained from Datastream; and the regulatory quality and rule of law indices published by the World Bank. Finally, to mitigate the effect of potential outliers, all variables are winsorized<sup>3</sup> at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

Table 2.2 shows the distribution of the firm-year observations for the total sample across industries, years and countries. Panel A of table 2.2 reveals a representation of different industries in the sample. Industrial and consumer services firms are the most represented

---

<sup>2</sup>According to the EPI Yale University website (<http://epi.yale.edu/>, last accessed: 7th of April 2014): “The EPI index ranks countries on performance indicators tracked across policy categories that cover both environmental public health and ecosystem vitality. These indicators provide a gauge at a national government scale of how close countries are to established environmental policy goals.”

<sup>3</sup>Winsorizing, sets all the data points less than the 1<sup>st</sup> percentile of each variable equal to the 1<sup>st</sup> percentile and all the data points exceeding the 99<sup>th</sup> percentile equal to the 99<sup>th</sup> percentile, thereby excluding extreme observations from the sample.

industries in the sample with 4,527 and 3,210 firm-year observations, respectively. In contrast, utilities and telecommunications are the least represented industries with 864 and 550 firm-year observations, respectively. Panel B of table 2.2 shows that apart from the first two years of the sample (2002-2003), there is a steady and growing availability of firm-year observations from 1,223 observations in 2004 to 2,207 observations in 2013. Panel C of table 2.2, reports the distribution of the firm-year observations according to the host country of the firms. The US, Japan and the UK are the most-represented countries with 7,654, 3,259 and 2,102 firm-year observations, respectively, whereas Morocco, Dubai and Egypt are the least-represented countries with 6, 3 and 2 observations, respectively.

## 2.5 Results

Tables 2.3, 2.4 and 2.5 present descriptive statistics for the variables included in the sample, regarding for firms lagging in ESP in comparison to the respective strategy leaders and that belong to the low cost, R&D differentiation and marketing differentiation group, respectively. In table 2.3, the mean value of the environmental score is 0.36 and the standard deviation is 0.28. The mean value for the Env Gap Cost variable is 0.44, however the median is significantly lower and equal to 0.17 indicating the presence of positive outliers in the sample. It also exhibits high standard deviations, equal to 0.78. The mean value and the standard deviation for social score are equal to -0.01 and 0.21 respectively. The mean age of the firms is 20.43 years with a standard deviation of 12 years. The mean number of employees is 20,196; however, the median value is 7,267, revealing that some large positive outliers drive the mean value. The Cash over Total Assets (slack) ratio has a mean value of 0.15. Regarding the ROA score, the mean value is 0.09. Turning to the country indices, EPI index, Openness, regulatory quality and rule of law have a mean value of 69.47, 0.48, 1.38 and 1.42 respectively. In table 2.4, the environmental score exhibits a mean value of 0.43 and a standard deviation equal to 0.30. The Env Gap R&D Diff variable exhibits a mean value of 0.37 and a median value of 0.30. The social score variable

exhibits a mean value 0.37 and a median value of 0.30. The mean age of firms is 20.93 and the standard deviation is 12.09. There is a presence of positive outliers for the number of employees, indicated by the mean and median value of 234,848.02 and 8,000 respectively. Regarding the Cash/Total Assets and the ROA score the mean value is 0.13 and 0.09 respectively. EPI index, Openness, regulatory quality and rule of law have a mean value of 69.81, 0.49, 1.38 and 1.42 respectively. In table 2.5 the mean value of the environmental score is 0.35 and the standard deviation is 0.27. The Env Gap Mrkt Diff variable exhibits a mean value of 0.38, a median value of 0.16 and a standard deviation of 0.64. The mean value of social score is -0.01 and the standard deviation is 0.21. The mean age of firms is 20.40 with a standard deviation of 11.9. The mean number of 20,543.19 employees and the median that equals to 7422 indicates the presence of outliers for the number of employees. The Cash/Total Assets and the ROA score have the mean value is 0.15 and 0.09 respectively. Last, the mean value for the country indices, EPI index, Openness, regulatory quality and rule of law have a mean value of 69.46, 0.48, 1.37 and 1.41 respectively.

In table 2.6, 2.7 and 2.8 pair-wise correlations among all variables are presented. To mitigate any multicollinearity concerns, we avoid using simultaneously in our estimated models pairs of variables that exhibit linear correlations in excess of 0.6.<sup>4</sup> The only pair of independent variables exhibiting a linear correlation in excess of 0.6 is the regulatory quality and rule of law indices with a correlation coefficient of 0.86 for all of the three tables (2.6, 2.7 and 2.8). Thus, these indices are used interchangeably in our estimated models. We report only the most parsimonious models in terms of individual significance (t-statistics) and maximization of the adjusted R<sup>2</sup>.

Columns M1 and M2 of table 2.9 and M3 to M6 of table 2.10 present the main results of this chapter exploring the relationship between environmental scores and strategy-based variables, while controlling for corporate reputation, firm characteristics and exploring

---

<sup>4</sup>This threshold is based on other studies (see for e.g., (Dick-Nielsen, Feldhütter, & Lando, 2012) and on the authors' economic judgment regarding the type of information each pair of variables share.

the effect of national context variables. Columns M1 to M3 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Cost of Goods Sold/Sales ratio which is used as a cost leadership indicator. Columns M1 and M2 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Cost of Goods Sold/Sales ratio which is used as a cost leadership indicator. Thus, M1 and M2 specifications include the Env Gap Cost variable as defined earlier in the chapter. Similarly, columns M3 to M6 refer to differentiation leadership, using two indicators. In specific, columns M3 and M4 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Env Gap R&D Diff variable (R&D expenses/Sales ratio), when columns M5 and M6 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Env Gap Markt Diff (Marketing expenses/Sales ratio).

Columns M1, M3 and M5 are of particular importance as they refer to the estimation of the model for the sub-samples of cost leaders and differentiation leaders, respectively, for firms exhibiting highest quartile of the COGS/Sales ratio, R&D expenses/Sales ratio and Marketing expenses/Sales ratio, respectively. In column M1, the coefficient of the Env Gap Cost is positive and highly significant (0.100, t-stat = 3.830). Similarly, regarding the marketing differentiation leaders in column M5 the Env Gap Markt Diff variable exhibits a positive and highly significant coefficient (0.103 and t-stat = 7.907). However, in column M5 for the marketing differentiation leaders, the coefficient of the Env Gap R&D Diff variable is insignificant (0.001 and t-stat 0.016).

Similar results hold for the medium quartiles (25 to 75%) of each leadership group, in columns M2, M4 and M6. In column M2, the coefficient of the Env Gap Cost is positive and highly significant (0.053 and t-stat 7.001). The coefficient is positive and highly significant in M6 for Env Gap Markt Diff variable (0.064 and t-stat 3.721) but not in M4 for Env Gap R&D Diff variable (-0.023 and t-stat -0.946).

In addition, as described earlier in the chapter, the endogeneity bias issue could arise in our panel data estimations due to simultaneity bias (i.e., that levels of environmental performance and social score are determined simultaneously), reverse causality (i.e., that

high levels of environmental performance could also improve a firm's social score), or a correlated omitted variables issue (i.e., that both environmental performance and social score are correlated with a third unknown and omitted variable, such as reputation and management). For this reason, in all M1 to M6 panel data estimations presented in table 2.5, we include the two-period lagged value of social score. The coefficient of social score is positive and highly significant in M1 and M5 specifications for cost leaders. Regarding differentiation leaders, the coefficient of social score is positive and highly significant in M4 but not in M3 specification (R&D differentiation), and positive and highly significant in both M5 and M6 (Marketing differentiation). In addition, some of the coefficients of the firm-specific control variables exhibit the a-priori expected positive signs and are highly significant: the logarithm of the age of the firm is significant and positive in M2, M4 and M6 specifications; the logarithm of the employees is positive and significant in all M1 to M6 specifications; the logarithm of the ratio cash over total assets (slack) is significant only in M3 and M5 but carries an unexpected negative sign and the return on assets is positive and significant only in M4, and significant but with an unexpected negative sign in column M1. From the country-specific indices, the rule of law coefficient is significant and positive in M1, M2 and in M4 specifications, Due to the aforementioned high linear correlation between the regulatory quality and rule of law indices, we only include the rule of law index in all specifications of table 2.9 and 2.10. This is because when estimating the model with the regulatory quality index instead of the rule of law index the overall explanatory power of the estimated model, measured by the adjusted  $R^2$ , was lower.

We include country, industry and time fixed effects, which account for unobserved heterogeneity in the sample examined. The number of observations is significantly lower than the whole available sample in all M1 to M6 specifications. This is due to the restriction of the sample in the respective quartiles (high and medium) and the use of lagged values in the explanatory variables.

## 2.6 Discussion and conclusion

The chapter started with the theoretical premises that converging and diverging processes may coexist in determining the environmental social performance (ESP) of firms. The former relates to mimetic isomorphism according to which the firm imitates the environmental practices of the strategic leaders in the group in which it belongs. It assumes that the bundle of resources and practices including environmental ones form the basis of comparisons and imitation. The competitive advantage, hence the practices of strategic leaders, is the legitimizing force at work behind the imitation. The imitation strategies are likely to induce firms lagging in environmental levels to adopt practices and take initiatives to close the gap. Results provide evidence which can be taken to support such process.

Results suggest that the gap from the leader has a significant effect on environmental activity. The imitation mechanism formulated and tested assumes that a firm identifies the best performing competitor in the sector and the strategic group to which it belongs, and tries to imitate its environmental practices. We classify firms into groups with low cost (cost leaders) and middle cost orientation according to the ratio of cost of goods sold over sales (COGS/Sales). The first group includes firms with a cost leadership orientation in their competitive strategy. The ratio used is the opposite of the gross margin, or the PCM (price – cost margin) and has been used in the literature as a low-cost orientation indicator (Hambrick, 1983; Spanos, Zaralis, & Lioukas, 2004). This cost indicator was found to be highly correlated with a subjective scale of the cost positioning of the firm's products orientation obtained by questionnaire sent to part of the population of firms (i.e. low, middle and up market positioning of products).

In the low-cost group, firms try to reduce costs (COGS) so as to be able to price their products/ services below their competitors. For example, in the low cost airlines segment, EasyJet may try to compare itself with Ryanair to see among others what environmental practices it employs. Comparison with the leader provides a strategy based legitimacy of the practices. Evidence presented confirms that the gap from the leader has a strong

statistically significant effect, being in line with the mimetic behavior proposition. Cost based imitation is a mechanism through which more firms initiate environmental actions, aimed not at mimicking the top firm in environmental practices but the one(s) with cost advantage. Thus, competitive isomorphism seems to act as a homogenizing mechanism pushing more firms to converge with the leader. Similar results are obtained for the middle group. The gap from the cost-leader in the respective group has a positive and statistically significant coefficient in both cost groups. So, imitating leaders in each group appears to be a robust finding. To explicate this let us consider the luxury goods which are clearly up market, non-low cost group. In the luxury industry, firms may have higher costs but are able to charge high prices, thus achieving higher price-cost margins (i.e. the ratio COGS/Sales is lower). This is obvious from the high gross margins in all luxury sectors (Kapferer, 2010; Kapferer & Tabatoni, 2010). In this segment of the market, firms may imitate the practices of luxury leaders, e.g. the environmental practices of Louis Vuitton as a leading luxury brand. However, it is not necessary that luxury leaders are also leaders in environmental social responsibility. Indeed the luxury industry has been criticized by some for lagging behind in sustainability.

In order to classify firms according to their differentiation strategy we utilize two sector adjusted ratios, the R&D expenses over Sales, and Marketing expenditure over Sales. The first ratio has also been used as an indicator of innovative differentiation (Spanos et al., 2004), or simply as differentiation (Hambrick, 1983). Results however suggest that the distance from the leading differentiating firm has an insignificant effect on the ESP of differentiating firms. This finding suggests that firms may not try to compare themselves with differentiation leaders when they belong in the high R&D group. Maybe the R&D intensity is not a reliable indicator of innovative differentiation, not covering important aspects of new product introduction. It may be that a new indicator for new product development would give different results. This is supported by some case specific evidence. For instance, 3M a company which is reckoned to be leader in innovation in chemicals, consumer and industrial goods (Govindarajan & Srinivas, 2013) may act as the differentiation leader for other firms in this sector engaged also in substantive R&D, which

compare their environmental practices with those of 3M. The implicit assumption is that 3M will adopt the appropriate environmental practices for a company oriented towards R&D and innovation. In other words its consistent performance in the innovative differentiation group legitimizes also its environmental practices. So, it is expected that other companies may imitate for example elements of the Pollution Prevention Pays program of 3M (Hart & Milstein, 2003; Reed, 2002; Shrivastava, 1995).

However, the insignificant effect of the distance from the leading differentiating firm on the ESP of R&D differentiating firms, indicating that firms which belong in the R&D differentiation group do not imitate the R&D differentiation leader is not surprising.

R&D practices have certain characteristics that deter the imitation by competitors. The fact that there is a lead-time period (the period between the start of a process and its completion) for every new R&D product (Winter, 2006), indicates that during the development process, there are intermediate stages that might be long and kept secret. So, as R&D practices are future-oriented and longer-term activities, there is a high degree of potential imitators' inaccessibility. Firms' R&D abilities may even differ between stages, meaning that some firms' successful R&D process may be due to an advantage in early stages while others' is due to a later stage advantage (Fershtman & Markovich, 2010). This complexity of R&D process joins the rapid progress of technology that makes innovators able to continuously improve their R&D practices before even the decodification of their previous ones (Zander & Kogut, 1995). Thus, successful R&D "recipe" is rather complicated to be imitated because of the several stages it comes through and the multiple combinations of them that lead to the desired result.

By investing in R&D, e.g. in product improvement, firms enjoy a source of competitive advantage that are not willing to lose because of rivals' imitation. Thus, as firms are using innovation and patents as strategic weapons (Artz, Norman, Hatfield, & Cardinal, 2010), they apply several strategies that preclude their rivals from monitoring their R&D practices both during their lead-time and also after their release. When firms' competitive advantage is based on technology or R&D lead, rather on other practices such as

marketing, new learning and continuous improvement of technology and R&D are necessary. Such practices remain as a competitive advantage only if they are inimitable, costly or complicated for rivals to imitate (Artz et al., 2010). Inimitability of R&D practices, e.g. patents, creates legal barriers that lead to superior performance and deters the possibility of creating substitutes. So, it is implicated that the superior economic performance of a firm over its rivals lies on the secrecy of its R&D capabilities and processes that secure its competitive advantage (Ceccagnoli, 2009; Markman, Espina, & Phan, 2004).

Lieberman & Montgomery (1988) examined the determinants of asymmetry in terms of R&D expenditures that is essential for the first-mover's superiority towards followers. They argued that technological leadership derives from the capability of keeping learning and technology as trade secrets, capturing the competitive advantage that derives from R&D expenditures. Similarly, (Ceccagnoli, 2009) examined the effect of appropriability, that reflects the extent to which a firm secures the value of innovation and R&D from rivals with strategies mentioned above such as secrecy, patent protection and first mover's advantages, on financial performance using models for differentiation and low cost strategy firms. Using a differentiation model, Ceccagnoli showed that a higher degree of appropriability indicates higher quality differences and leads to profitability increase.

However, technology secrecy and patents do not assure pioneers for a long term superiority over their competitors, because there might be an eventual time that the latter will be able to draw from their technological knowledge and imitate them (Mansfield, Schwartz, & Wagner, 1981). Although, firms' lead in R&D practices is based on a complex of mechanisms. Pioneers have the advantage of precedence regarding certain assets that create barriers to rivals' entry. First, they may be the first having certain information or locating opportunities that respond to markets which are able to give profits to only a limited number of firms (preemption of space). Second, there are extra difficulties for the followers that prevent them to make a successful "leap frog" ahead, such as the cost of extra resources in order to be adjusted to the demands of new R&D

investments (Helpman, 1993) (new equipment, training employee) and to attract stakeholders that may be already devoted to the pioneers because of customer loyalty or a well-known brand name (Lieberman & Montgomery, 1988; Mansfield et al., 1981; Porter, 1976).

It is evident that imitation of R&D practices is prevented by a combination of mechanisms that include the difficulty itself for R&D to be duplicated, the cost and the required resources of the imitating process (Helpman, 1993), the continuous “chase” of the rapid change of technology (Zander & Kogut, 1995) and the uncertainty of the returns of R&D investment due to certain privileges that pioneers enjoy. Besides, R&D investment is one of the most risky financing area because the development of a new technology practice carries uncertainty factors including its profitability. So, R&D imitation occurs under more complex circumstances that make it difficult to take place and may discourage rivals to attempt it because of the uncertainty of its results and returns.

Results for marketing differentiation provide full support to the proposition of the chapter. The effect is particularly strong for the differentiation group (high t-value), but is also significant for firms in the middle group. So evidence of imitative behavior in marketing exists across groups.

Importantly, unreported results suggest that firms exhibit imitative behavior regarding their ESP only in comparison to the strategic leaders, and not in comparison to the leader in ESP. Specifically, if the strategic orientation of the firms is ignored and the gap variable is defined as the distance from the leader in environmental performance per different groups of environmental performance (high 75%-100% and middle 25%-75% quartiles) then the estimated coefficients of the gap variable are insignificant, showing no imitation. The insignificant coefficients in this case may be attributable to the dependence between the two variables defining the gap (i.e. environmental score of the focal firm minus the environmental score of the leader in terms of environmental score). In this case the top environmental performers may achieve high standards of environmental practice, having

little variability among the environmental leaders across groups. The excellence may not exhibit variability acting almost as a constant.

Regarding the firm specific variables used, the social score is significant in most equations. This obtains for both low cost groups, for middle differentiation groups (for R&D indicator) and across all groups for the marketing differentiation. This variable indicates that social reputation has a dynamic effect, exerting its influence on the environmental performance. As explained earlier in this chapter we follow (Surroca, Tribo, & Waddock, 2009) to account for possible endogeneity issues. As suggested by signaling theory reputable firms choose to disclose more information regarding their environmental activities to send certain signals to the market, to preserve or enhance their social corporate reputation (Robinson et al., 2011). Next, the age variable is shown to have a significant positive effect in middle groups for all cost, R&D and marketing differentiation. This result can be attributed to the fact that older firms are more widely known with vested stakeholder relationships, and hence have significant incentives to exhibit higher environmental engagement. In turn, firm's size has a strong significant effect in all equations indicating that larger firms are more advanced in environmental practices. This may be a result of the visibility that large firms attract and their desire to obtain and preserve social capital. Regarding other firm level controls, cash over total assets and firm performance give rather weak and mixed results. Overall firm specific variables are important, and account for a significant part of the heterogeneity in firms environmental practices. In order to capture such sectoral differences we introduce sector dummies in all estimations. Indeed these dummies are jointly significant and justify their inclusion in the model.

The national factors included as possible determinants of the environmental performance at the firm-level results are mixed. The most significant indicators are the rule of law (or the regulatory quality) in the low cost and middle cost group for firms lagging in ESP. The results suggest that regulatory aspects are a significant consideration for companies with low cost strategy. It seems that firms in these groups, in their effort to reduce costs, may

move close to the limits prescribed by regulations, trying to apply the minimum possible in order to reduce costs. Or they are taking the risk of being criticized for their environmental conduct, often unfairly, as they do not create a safety gap moving beyond compliance. High-end differentiators, by contrast, are not affected by rule of law or regulatory quality. It is likely that differentiators move well beyond compliance, in order to avoid taking risks of public criticism, or because sustainability fits with their differentiation strategy (Hart, 1995). It is surprising that the Environmental Performance Index of the country (EPI), which gives a measure of sustainability policies in the country, is not significant. This could be attributed to the fact that EPI is a gross national indicator, not necessarily relevant to the specific environment of the firms, which is sector-specific.

Overall, the results have important theoretical implications. They demonstrate the working and relevance of imitative conformism through search and learning mechanisms based on competitive strategy. As such they confirm empirically the theoretical propositions put forward by (Chandler & Hwang, 2015). Furthermore, institutionalism seems to work selectively at the national level, with regulatory quality and rule of law mainly applying to low and middle cost groups of firms. Differentiators are likely to move beyond compliance. The results suggest that the integration of institutional theory with business strategy opens a fruitful field for further research. The effort to formulate and test specific imitation mechanism would provide an interesting avenue for making the institutional theory prescriptions more practical and testable. In this chapter we have shown that mechanisms based on strategy give rise to strong voluntary competitive isomorphism (DiMaggio & Powell, 1983). Other mechanisms would be devised to give operational form to legitimacy and acceptance by external constituencies (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Oliver, 1991; Scott, 1987). These have to be contrasted with internal mechanisms generating innovations and environmentally induced advantage which exist even though the firm's ESP is lagging the strategy leader and engages in imitation (Dunphy et al., 2007; Kitzmueller & Shimshack, 2012; Nijhof & Jeurissen, 2010; Porter & Kramer, 2006). At country level also pressures portraying

coercive characteristics (DiMaggio & Powell, 1983) need to be devised based on sector specific critical aspects of regulations.

It is also important to note that specific firm variables are significant determinants of environmental conduct of firms. They explain significant part of the heterogeneity among firms, and suggest that social reputation and legitimacy are important concerns. So convergence to leaders in strategy and firm specific heterogeneity persist. Convergence seems to be incomplete as variance persists. Partly this may be due to partial and incomplete imitation, due to information asymmetry and the complexity of interrelations among practices. Ultimately it may be due to the uniqueness of the bundles of practices that exist in firms, and the presence of unknown complementarities with other resources and capabilities of the firm (Posen et al., 2013). And also to internally generated capabilities by firms taking a proactive lead in environmental initiatives. This opens an avenue for future research, with more imitative mechanisms forces being specified, and firm specific uniqueness being modeled as a counterforce to imitation.

The strategy based voluntary imitative conformism is a homogenization force of firms, pushing firms to comply with the strategy leaders. This is evidence that converging processes are in operation. Despite these imitation forces, however, firm specific variety persists. Why some firms are more advanced in environmental practices than others, although they imitate the same leader and get the same country pressures? An explanation in this heterogeneity may be due to specific firm characteristics which affect the adoption and adaptation of environmental practices (Perez-Aleman, 2011), and the opportunities found by firms taking a proactive environmental stance. The importance of other firm specific and country specific variables have also indicated, including the firm's social reputation and social desirability, and the conditions under which regulation and the rule of law may apply.

The persistence of firm heterogeneity may also be due to imperfect imitation. The firm may achieve partial adoption and adaptation of the practices of leaders, because of selection and partial knowledge (Perez-Aleman, 2011; Posen et al., 2013). Also because

of changes and adaptation during implementation (Ansari, Fiss, & Zajac, 2010). Mimicking the whole array of practices of competitors may not be feasible and practical (Bromiley & Rau, 2014). Although imitation of best competitors is a legitimization force, there is no exact knowledge of the contribution of the many individual practices on the success of the competitive strategy (McWilliams & Siegel, 2011). Due to the presence of asymmetric information, it is often difficult for the imitating firm to assess the outcome of environmental components. Viewed from a resource based view (RBV) perspective the contribution of individual practices in the competitive bundle of resources and capabilities may not work in isolation but as supplementary or in conjunction with inputs such as skills and capabilities which the firm may not possess. So mimicking leaders may not give the value that would legitimize the actions of the firm. The interplay of imitation and heterogeneity forces may be directed by managers, giving a room for the firm to apply its own competitive recipe. Practical implications follow as mimetic forces appear to be a strong force in promoting environmental practices. International standards and data bases, such as ASSET 4, would provide sector specific indices showing gaps and convergences in strategic groups. These would be of practical value to regulators and managers.

The results reported support the main hypothesis of this chapter that strategy based imitation mechanisms explain environmental engagement at the firm level. Firms seem to value competitive strategy at a higher level than environmental practices giving rise to competitive imitation for firms lagging in ESP. However, both converging and diverging processes seem to coexist in a given sector. Competitive advantage in product markets and potentially associated superior performance is likely to be the causes of both competitive imitation of environmental strategies and endogenous proactive innovative advances in environmental actions by the firm on its own. This is in line with the arguments advanced by several authors (Christmann, 2000; Posen et al., 2013; Ullmann, 1985). So the search for which practices to imitate is “local”, being directed to firms positioned in the same strategic group and recognized as leaders in performance. This is in line with the mindful or inferential learning suggested by (Chandler & Hwang, 2015).

**Table 2.1: Explanatory variables of environmental score**

| Types of variables              | Description   | Expected Sign |
|---------------------------------|---|---------------|
| <b>Dependent variable</b>       | <i>Environmental score</i> : The score assigned by ASSET4 database for the environmental pillar of each firm.   |               |
|                                 | <i>Distance from cost leader (Env Gap Cost)</i> : This is the squared difference of environmental score between the focal firm and the cost leader, divided by the environmental score of the cost leader. For each industry-year pair of the sample the cost leader is defined as the firm exhibiting the maximum ratio of cost of goods sold over sales.  | +             |
|                                 | <i>Distance from differentiation leader (Env Gap R&amp;D Diff)</i> : This is the squared difference of environmental score between the focal firm and the differentiation leader, divided by the environmental score of the differentiation leader. For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of R&D expenses over sales.                              | +             |
| <b>Distance from the leader</b> | <i>Distance from differentiation leader (Env Gap Markt Diff)</i> : This is the squared difference of environmental score between the focal firm and the differentiation leader, divided by the environmental score of the differentiation leader. For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of marketing expenses over sales.                          | +             |
|                                 | <i>Social score</i> : The social pillar score, assigned by ASSET4 to each firm in the sample, measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. | +             |
|                                 | <i>Age</i> : The number of years the firm operates.   | +             |
| <b>Firm-specific factors</b>    | <i>Employees</i> : The total number of employees as reported in Datastream database.  | +             |
|                                 | <i>Cash and cash equivalents / Total Assets (Cash_TA)</i> : This is the ratio of item (WC02001) over item (WC02999) of Worldscope database which account for cash and due from banks for banks in the sample, cash for insurance companies in the sample and cash and short term investments for all other industries in the sample and total assets, respectively.   | +             |
|                                 | <i>Return on assets (ROA)</i> : The ratio of net income over total assets. It is used as an indication of firm's profitability.   | +             |
|                                 | <i>Environmental performance index (EPI)</i> : This is an index published by Yale University representing the overall environmental performance of a country.   | +             |
| <b>Country factors</b>          | <i>Openness ((imports+exports)/GDP)</i> : This is the ratio of the summation of imports and exports over the total GDP of a country's economy. It is used as a measure of an economy's openness and international trade.  | +             |
|                                 | <i>Regulatory quality</i> : This is an index, published by World Bank, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Higher values of the index indicate higher regulatory quality.   | +             |
|                                 | <i>Rule of Law</i> : This is an index, published by World Bank, which captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Higher values of the index indicate higher rule of law.   | +             |

**Notes:** This table lists all the explanatory variables examined in this chapter as possible determinants of the environmental score. The column "Expected Sign" refers to the a priori theoretical sign of the explanatory variable.

**Table 2.2: Sample distribution of firm-year observations across industries, years and country**

| <b>Panel A: Sample distribution across sectors</b> |                     |  |  |
|--|---------------------|--|--|
| <b>Industry categories</b>                         | <b>Observations</b> |  |  |
| Basic materials                                    | 2,204               |  |  |
| Consumer goods                                     | 3,042               |  |  |
| Consumers services                                 | 3,210               |  |  |
| Financials   | 1,578               |  |  |
| Healthcare   | 1,504               |  |  |
| Industrials  | 4,527               |  |  |
| Oil & Gas  | 1,700               |  |  |
| Technology   | 2,208               |  |  |
| Telecommunications                                 | 550                 |  |  |
| Utilities  | 864                 |  |  |
| <b>Total</b>                                       | <b>21,207</b>       |  |  |

| <b>Panel B: Sample distribution across years</b> |                     |
|--|---------------------|
| <b>Year</b>                                      | <b>Observations</b> |
| 2002   | 645                 |
| 2003   | 658                 |
| 2004   | 1,223               |
| 2005   | 1,524               |
| 2006   | 1,525               |
| 2007   | 1,610               |
| 2008   | 1,920               |
| 2009   | 2,183               |
| 2010   | 2,577               |
| 2011   | 2,628               |
| 2012   | 2,507               |
| 2013   | 2,207               |
| <b>Total</b>                                     | <b>21,207</b>       |

| <b>Panel C: Sample distribution across countries</b> |                     |                    |                     |
|--|---------------------|--------------------|---------------------|
| <b>Country</b>                                       | <b>Observations</b> | <b>Country</b>     | <b>Observations</b> |
| Australia  | 465                 | Japan              | 3,259               |
| Austria  | 147                 | Malaysia           | 40                  |
| Belgium  | 148                 | Mexico             | 91                  |
| Brazil   | 209                 | Morocco            | 6                   |
| Canada   | 1,074               | Netherlands        | 255                 |
| Chile  | 34                  | New Zealand        | 11                  |
| China  | 310                 | Norway             | 155                 |
| Colombia   | 19                  | Philippines        | 35                  |
| Czech Republic                                       | 16                  | Poland             | 53                  |
| Denmark  | 149                 | Portugal           | 27                  |
| Dubai  | 3                   | Russian Federation | 59                  |
| Egypt  | 2                   | Saudi Arabia       | 11                  |
| Finland  | 145                 | Singapore          | 143                 |
| France   | 539                 | South Africa       | 190                 |
| Germany  | 685                 | South Korea        | 305                 |
| Greece   | 143                 | Spain              | 99                  |
| Hong Kong  | 679                 | Sweden             | 416                 |
| Hungary  | 8                   | Switzerland        | 469                 |
| India  | 22                  | Taiwan             | 380                 |
| Indonesia  | 88                  | Thailand           | 9                   |
| Ireland  | 78                  | Turkey             | 74                  |
| Israel   | 46                  | UK                 | 2,102               |
| Italy  | 315                 | US                 | 7,654               |
|  |                     | <b>Total</b>       | <b>21,207</b>       |

**Table 2.3: Descriptive Statistics: Low Cost Strategy**

|  | Observations | Mean  | Median | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|--|--------------|-------|--------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>       | 11403.00     | 0.36  | 0.23   | 0.08    | 0.97    | 0.28               | 0.84     | 2.22     |
| <b>Env Gap Cost<sub>t-2</sub></b>      | 7487.00      | 0.44  | 0.17   | 0.00    | 3.76    | 0.78               | 3.08     | 12.43    |
| <b>Social Score<sub>t-2</sub></b>      | 4456         | -0.01 | -0.03  | -0.76   | 0.66    | 0.21               | 0.14     | 3.23     |
| <b>Age (in years)</b>                  | 11330        | 20,43 | 18     | 1       | 46      | 12                 | 0,28     | 1,86     |
| <b>Employees</b>                       | 11402        | 20196 | 7267   | 15      | 267830  | 38205              | 4,143    | 23,183   |
| <b>Cash/Total Assets</b>               | 11401        | 0.15  | 0.10   | 0.00    | 0.65    | 0.14               | 1.56     | 5.33     |
| <b>Firm performance (ROA score )</b>   | 11398        | 0.09  | 0.08   | -0.20   | 0.39    | 0.09               | 0.60     | 5.23     |
| <b>Environmental Performance Index</b> | 9847         | 69.47 | 67.53  | 29.99   | 88.79   | 7.41               | -0.92    | 6.31     |
| <b>Openness</b>                        | 11195        | 0.48  | 0.30   | 0.25    | 1.23    | 0.28               | 1.31     | 3.85     |
| <b>Regulatory Quality</b>              | 11354        | 1.38  | 1.48   | -0.70   | 2.00    | 0.44               | -2.03    | 7.92     |
| <b>Rule of law</b>                     | 11354        | 1.42  | 1.58   | -0.95   | 2.00    | 0.50               | -2.66    | 9.97     |



**Table 2.4: Descriptive Statistics: Innovation Differentiation Strategy (R&D)**

|   | Observations | Mean     | Median | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|---|--------------|----------|--------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>          | 15593        | 0.43     | 0.32   | 0.08    | 0.97    | 0.30               | 0.48     | 1.67     |
| <b>Env Gap R&amp;D Diff<sub>t-2</sub></b> | 10429        | 0.37     | 0.30   | 0.00    | 2.28    | 0.39               | 2.12     | 10.70    |
| <b>Social Score<sub>t-2</sub></b>         | 6340         | 0.00     | 0.00   | -0.75   | 0.67    | 0.21               | 0.06     | 3.12     |
| <b>Age (in years)</b>                     | 15485        | 20,93    | 19     | 1       | 46      | 12,09              | 0,24     | 1,84     |
| <b>Employees</b>                          | 15592        | 23848,02 | 8000   | 15      | 267830  | 44361.49           | 3.65     | 17,81    |
| <b>Cash/Total Assets</b>                  | 15589        | 0.13     | 0.09   | 0.00    | 0.65    | 0.13               | 1.72     | 6.06     |
| <b>Firm performance (ROA score )</b>      | 15586        | 0.09     | 0.08   | -0.20   | 0.39    | 0.08               | 0.71     | 5.39     |
| <b>Environmental Performance Index</b>    | 13411        | 69.81    | 67.53  | 30.69   | 88.79   | 7.49               | -1.00    | 6.22     |
| <b>Openness</b>                           | 15303        | 0.49     | 0.30   | 0.25    | 1.23    | 0.27               | 1.22     | 3.73     |
| <b>Regulatory Quality</b>                 | 15518        | 1.38     | 1.50   | -0.70   | 2.00    | 0.44               | -1.97    | 7.57     |
| <b>Rule of law</b>                        | 15518        | 1.42     | 1.58   | -0.95   | 2.00    | 0.51               | -2.56    | 9.35     |



**Table 2.5: Descriptive Statistics: Marketing Differentiation Strategy**

|   | Observations | Mean     | Median | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|---|--------------|----------|--------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>        | 11315        | 0.35     | 0.22   | 0.08    | 0.97    | 0.27               | 0.91     | 2.40     |
| <b>Env Gap Markt Diff<sub>t-2</sub></b> | 7290         | 0.38     | 0.16   | 0.00    | 3.48    | 0.64               | 3.25     | 14.43    |
| <b>Social Score<sub>t-2</sub></b>       | 4253         | -0.01    | -0.02  | -0.76   | 0.66    | 0.21               | 0.21     | 3.13     |
| <b>Age (in years)</b>                   | 11248        | 20,40    | 18     | 1       | 46      | 11,90              | 0,28     | 1,87     |
| <b>Employees</b>                        | 11314        | 20543,19 | 7422   | 15      | 267830  | 39123.69           | 4,09     | 22,37    |
| <b>Cash/Total Assets</b>                | 11313        | 0.15     | 0.10   | 0.00    | 0.65    | 0.14               | 1.55     | 5.18     |
| <b>Firm performance (ROA score )</b>    | 11310        | 0.09     | 0.08   | -0.20   | 0.39    | 0.09               | 0.57     | 5.31     |
| <b>Environmental Performance Index</b>  | 9739         | 69.46    | 67.53  | 31.03   | 88.79   | 7.45               | -0.93    | 6.29     |
| <b>Openness</b>                         | 11110        | 0.48     | 0.30   | 0.25    | 1.23    | 0.28               | 1.29     | 3.78     |
| <b>Regulatory Quality</b>               | 11266        | 1.37     | 1.49   | -0.70   | 2.00    | 0.44               | -2.00    | 7.72     |
| <b>Rule of law</b>                      | 11266        | 1.41     | 1.58   | -0.95   | 2.00    | 0.51               | -2.60    | 9.58     |

**Notes:** Min and max are the minimum and maximum values of the sample data, respectively. Skewness and kurtosis are the estimated centralized third and fourth moments of the data. See also table 2.1 for definitions of variables. All variables are winsorized at 1<sup>st</sup> and 99<sup>th</sup> percentiles



**Table 2.6: Correlation matrix of variables: Low Cost Strategy**

|    |                                 | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|---------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance       | 1     |       |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap Cost <sub>t-2</sub>     | 0.28  | 1     |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>     | 0.15  | 0.04  | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                       | 0.19  | 0.06  | -0.09 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                 | 0.26  | 0.10  | -0.18 | 0.20  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets Firm          | -0.13 | -0.01 | -0.07 | -0.14 | -0.05 | 1     |       |      |      |             |    |
| 7  | performance (ROA score )        | -0.05 | 0.01  | 0.15  | -0.08 | -0.20 | 0.16  | 1     |      |      |             |    |
| 8  | Environmental Performance Index | 0.13  | 0.03  | 0.04  | -0.02 | -0.15 | 0.00  | -0.05 | 1    |      |             |    |
| 9  | Openness                        | 0.14  | 0.06  | 0.12  | -0.15 | -0.22 | -0.06 | -0.04 | 0.60 | 1    |             |    |
| 10 | Regulatory Quality              | -0.04 | -0.04 | 0.13  | 0.03  | -0.57 | -0.07 | 0.13  | 0.41 | 0.30 | 1           |    |
| 11 | Rule of law                     | -0.01 | -0.01 | 0.07  | 0.09  | -0.40 | -0.03 | 0.12  | 0.37 | 0.16 | <b>0.86</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold.



**Table 2.7: Correlation matrix of variables: Innovation Differentiation Strategy (R&D)**

|    |                                 | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|---------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance       | 1     |       |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap R&D Diff <sub>t-2</sub> | -0,34 | 1     |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>     | 0,17  | -0,08 | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                       | 0,18  | -0,09 | -0,06 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                 | 0,22  | -0,05 | -0,14 | 0,19  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets               | -0,18 | 0,05  | -0,04 | -0,14 | -0,07 | 1     |       |      |      |             |    |
| 7  | Firm performance (ROA score )   | -0,04 | 0,04  | 0,17  | -0,08 | -0,17 | 0,19  | 1     |      |      |             |    |
| 8  | Environmental Performance Index | 0,15  | -0,03 | 0,01  | -0,05 | -0,18 | 0,00  | -0,08 | 1    |      |             |    |
| 9  | Openness                        | 0,16  | -0,06 | 0,11  | -0,15 | -0,24 | -0,05 | -0,03 | 0,62 | 1    |             |    |
| 10 | Regulatory Quality              | 0,03  | -0,02 | 0,09  | 0,03  | -0,52 | -0,09 | 0,11  | 0,43 | 0,31 | 1           |    |
| 11 | Rule of law                     | 0,01  | -0,01 | 0,02  | 0,09  | -0,34 | -0,03 | 0,09  | 0,36 | 0,17 | <b>0,86</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold



**Table13.8: Correlation matrix of variables: Marketing Differentiation Strategy**

|    |                                   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance         | 1     |       |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap Markt Diff <sub>t-2</sub> | 0,26  | 1     |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>       | 0,16  | 0,07  | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                         | 0,19  | 0,07  | -0,07 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                   | 0,24  | 0,11  | -0,15 | 0,22  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets                 | -0,11 | -0,01 | -0,07 | -0,14 | -0,05 | 1     |       |      |      |             |    |
| 7  | Firm performance (ROA score )     | -0,03 | 0,00  | 0,14  | -0,08 | -0,18 | 0,16  | 1     |      |      |             |    |
| 8  | Environmental Performance Index   | 0,13  | 0,05  | 0,00  | -0,04 | -0,14 | 0,00  | -0,07 | 1    |      |             |    |
| 9  | Openness                          | 0,14  | 0,03  | 0,10  | -0,16 | -0,25 | -0,05 | -0,03 | 0,64 | 1    |             |    |
| 10 | Regulatory Quality                | 0,01  | -0,01 | 0,13  | 0,01  | -0,56 | -0,08 | 0,14  | 0,37 | 0,32 | 1           |    |
| 11 | Rule of law                       | 0,03  | 0,04  | 0,06  | 0,08  | -0,36 | -0,02 | 0,11  | 0,33 | 0,18 | <b>0,86</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold



**Table 2.9: Panel Regressions-Low Cost Strategy**

|                                   | Environmental Score                                    |   |
|-----------------------------------|--|---|
|                                   | M1<br>High group<br>(>75% Cost of goods<br>sold/Sales) | M2<br>Middle group<br>(25-75% Cost of goods<br>sold/Sales ) |
| <b>Env Gap Cost<sub>t-2</sub></b> | 0.100***<br>(3.830)                                    | 0.053***<br>(7.001)   |
| <b>Social Score<sub>t-2</sub></b> | 0.126**<br>(2.511)                                     | 0.142***<br>(3.270)   |
| <b>Age</b>                        | 0.015<br>(0.717)                                       | 0.048***<br>(2.858)   |
| <b>Employees</b>                  | 0.018*<br>(1.890)                                      | 0.094***<br>(9.221)   |
| <b>Cash/Total Assets</b>          | -0.152<br>(-0.990)                                     | 0.005<br>(0.074)  |
| <b>Firm performance</b>           | -0.554***<br>(-2.819)                                  | -0.212<br>(-1.561)  |
| <b>EPI</b>                        | -0.027<br>(-0.399)                                     | 0.011<br>(.)  |
| <b>Openess</b>                    | -0.301<br>(-0.775)                                     | 0.196<br>(0.684)  |
| <b>Rule of law</b>                | 0.625***<br>(2.612)                                    | 0.378***<br>(3.408)   |
| <b>Constant</b>                   | 1.307<br>(0.224)                                       | -2.089***<br>(-4.629)                                       |
| <b>Observations</b>               | 568  | 2011  |
| <b>Adjusted R<sup>2</sup></b>     | 0.4344   | 0.4435  |

**Notes:** Cost-Leaders: They charge low prices relative to their COGS, so the difference between SALES-GOGS is small and the price cost margin ratio ((Sales-COGS)/Sales) is small. (but they sell a large volume of units and thus they only aim on having a small profit from each unit sold - say cars made by KIA). Non-cost leaders (differentiators): They charge high prices relative to their COGS, so the difference between SALES-GOGS is large and the price cost margin ratio ((Sales-COGS)/Sales) is large. (but they only have a small volume of sales thus they need to earn a lot of money from each unit sold - say cars made by Mercedes-Benz).



**Table 2.10: Panel Regressions-Differentiation Strategy**

|  | <b>Environmental Score</b>                                 |   |  |   |                     |
|--|--|---|--|---|---------------------|
|  | <b>R&amp;D Differentiation Leaders</b>                     |   | <b>Marketing Differentiation Leaders</b>                         |   |                     |
|  | <b>M3</b>  | <b>M4</b>   | <b>M5</b>  | <b>M6</b>   |                     |
|  | <b>High group<br/>(&gt;75% R&amp;D<br/>expenses/Sales)</b> | <b>Middle group<br/>(25-75% R&amp;D<br/>expenses/Sales)</b> | <b>High group<br/>(&gt;75%<br/>Marketing<br/>expenses/Sales)</b> | <b>Middle group<br/>(25-75%<br/>Marketing<br/>expenses/Sales)</b> |                     |
| <b>Env Gap R&amp;D Diff<sub>t-2</sub></b>  | 0.001<br>(0.016)   | -0.023<br>(-0.946)  | <b>Env Gap Markt Diff<sub>t-2</sub></b>                          | 0.103***<br>(7.907)   | 0.064***<br>(3.721) |
| <b>Social Score<sub>t-2</sub></b>          | 0.019<br>(0.178)   | 0.140***<br>(2.721)   | <b>Social Score<sub>t-2</sub></b>                                | 0.121**<br>(2.375)  | 0.086*<br>(1.676)   |
| <b>Age</b>                                 | 0.019<br>(0.526)   | 0.044**<br>(2.369)  | <b>Age</b>   | 0.023<br>(0.948)  | 0.059***<br>(3.821) |
| <b>Employees</b>                           | 0.083***<br>(4.301)  | 0.115***<br>(13.718)  | <b>Employees</b>   | 0.050***<br>(4.632)   | 0.067***<br>(6.150) |
| <b>Cash/Total Assets</b>                   | -0.197*<br>(-1.928)  | -0.123<br>(-1.118)  | <b>Cash/Total Assets</b>   | -0.108*<br>(-1.773)   | -0.044<br>(-0.611)  |
| <b>Firm performance<br/>(ROA score )</b>   | -0.007<br>(-0.040)   | 0.379**<br>(2.204)  | <b>Firm performance<br/>(ROA score )</b>                         | -0.115<br>(-1.598)  | -0.027<br>(-0.228)  |
| <b>Environmental<br/>Performance Index</b> | -0.025<br>(.)  | -0.001<br>(-0.040)  | <b>Environmental<br/>Performance Index</b>                       | -0.015<br>(-0.846)  | -0.019<br>(-0.788)  |
| <b>Openess</b>                             | -0.028<br>(-0.047)   | 0.467<br>(1.492)  | <b>Openess</b>   | 0.123<br>(0.557)  | 0.439<br>(1.354)    |
| <b>Rule of law</b>                         | -0.475**<br>(-1.974)                                       | 0.260***<br>(7.409)   | <b>Rule of law</b>   | -0.348<br>(-1.282)  | 0.256<br>(1.227)    |
| <b>Constant</b>                            | 2.718<br>(.)   | -1.204<br>(-0.511)  | <b>Constant</b>  | 1.564<br>(0.834)  | 0.467<br>(0.235)    |
| <b>Observations</b>                        | 414  | 1269  | <b>Observations</b>  | 792   | 1788                |
| <b>Adjusted R<sup>2</sup></b>              | 0.6383   | 0.3992  | <b>Adjusted R<sup>2</sup></b>                                    | 0.5282  | 0.3793              |

## **Chapter 3: Proactive environmental strategies: An examination across generic strategy groups**

### **3.1 Abstract**

This chapter examines mechanisms of proactive corporate environmental social performance (ESP) in relation to the generic strategies framework. It proposes that proactive firms both are monitoring the environmental practices of the strategic leaders in their respective strategic group, but also enter into a dynamic process of continuous improvements which are path-dependent and unique. We focus on “proactive” firms which have a lead in ESP in comparison to strategy leaders. We find that they don’t regress back to the levels of ESP of the group leaders, contrary to what an isomorphic perspective would maintain. Instead they accelerate and invest even more in environmental initiatives. The more the ESP excess of the firm in comparison to the ESP of the strategy leader the higher its inclination to take proactive initiatives to further advance its performance in sustainable business development. Results show that this obtains across all strategy groups, being a common characteristic across generic strategies. Theoretical implications are discussed as the results suggest a turning point in competitive benchmarking after which ESP isomorphism may not operate. As firms discover the world of sustainability they develop a firm specific dynamic capability, triggered by local search and self-reinforced by learning and experience. Proactive environmental strategies may enhance the competitive advantage across generic strategies. Theoretical and empirical implications are discussed.

### 3.2 Introduction

Environmental practices have been integrated rapidly in business strategy during last decades, with proactive environmental behavior being practiced by many firms (Aragón-Correa & Sharma, 2003). Proactivity has made several authors to rethink about the motives and rationale, trying to explain and justify its case in relation to instrumental and altruistic ethical perspectives.

Several arguments about the rationality and scope of incorporating environmental practices in the competitive strategy have been made. (Freeman, 1984) argued that corporate social responsibility creates positive impact and good reputation because of stakeholder satisfaction. Although the motives for this behavior are not very clear (Jones, 1995, p.406), the stakeholders perspective integrates the observed practice (empirical view) about the role of constituents (other than shareholders), with both instrumental and normative aspects (Donaldson & Preston, 1995). There has been an intense debate on the motives and ethical values of corporations and managers in undertaking environmental initiatives (Aguilera et al., 2007; Egri & Herman, 2000; Freeman et al., 2000; Lindenberg & Steg, 2007; Papagiannakis & Lioukas, 2012). Also there has been debate about regulatory and country level conditions (Schultz & Zelenzy, 1999) and the way they are affecting corporate environmental responsiveness.

As regards the business case, corporate sustainability could be quantified in increased revenues, reduced costs of energy, waste, material or water savings, and overall firm competitiveness. This constitutes the instrumental perspective for ESP giving prominence to benefits against costs. The economic logic of the business case has been recognized as a distinct and often dominant factor (Aguilera et al., 2007; Jones, 1995; Kitmueller & Shimshack, 2012; Lindenberg & Steg, 2007; Margolis & Walsh, 2003; McWilliams & Siegel, 2011). The instrumental view is in line with (Friedman, 1970) who argued that the only social responsibility a firm has is to increase its profits as long as it conforms to the rules that the society has put in place. On the other hand, some compulsory standards and demands imposed by regulatory provisions and by corporate associations and certifying

institutions enhance pro - environmental responses and strategies (DiMaggio & Powell, 1983; Porter & Kramer, 2006; Porter & Van der Linde, 1995; Sharma & Vredenburg, 1998).

Existing research has mainly examined the business case of corporate environmental performance (CEP) as a standalone practice that takes place for ethical, regulatory or profitability purposes, and as a dimension embedded in the general corporate strategy. However, it is important to highlight the dynamic imitative and generative processes of corporate environmental responses. The firm may not necessarily make a stand alone individual environmental strategy. The actual environmental strategy is emerging and continuously reformed in the framework of constant search for new practices, benchmarking itself with the strategy practices of its competitors, feedback and learning from the outcomes of its actions taken. As the process unravels it takes a life on its own generating further innovations.

According to institutional theory firms should adopt their rivals' practices either because they are considered legitimate or compulsory in their sector (normative and coercive imitation), or because they are trying to imitate and resemble their most successful competitors (mimetic or competitive isomorphism) (DiMaggio & Powell, 1983; Oliver, 1991). In addition, the generic strategies perspective maintains that the search of best practices should be focused on the best performing competitors or the leaders within a firm's strategic group (low cost or differentiation group). So, strategy leaders constitute benchmarks in searching for good practices, implying that firms do not form their environmental practices by monitoring the environmental leaders, but by imitating the competitive strategy leaders. Firms are monitoring the revealed dimensions of their best competitors' strategy, to the extent that they can track them. When they discover that the environmental performance of the strategy leader is better than theirs, they try to imitate it. But what happens if they discover that their own ESP is better than that of the strategy leaders? This may occur as strategy leaders are not always environmental leaders (Kapferer, 2010).

This chapter investigates the reaction of firms that belong to a specific strategy group (cost or differentiation strategy), when they detect that their strategy leaders are not the environmental leaders and actually they have better environmental performance than these leaders. Do they settle for that, leaving their excess to continue? Do they put a break in their environmental actions as they find rationalization not to continue with their environmental practices further and just revert to the lower levels of the leaders? Are they looking up for specific practices which are different than theirs, trying to imitate? Or do they find an opportunity for competitive advantage on which they work on? According to imitative behavior, firms that find themselves having a more advanced environmental performance than strategic leaders, would probably settle for that and continue their search for imitating the practices in which they are lagging, or practices more related to their generic strategy characteristics. Success is associated with specific capability based advantage and not with their purely generic strategy practices (Grant, 1996). We argue that firms with higher environmental performance than their strategic leaders, do not rest on their laurels, but instead they enhance their environmental lead and open their own way by generating further environmental initiatives, enhancing their competitive advantage (Dunphy et 2007; Nijhof and Jeurissen, 2010; Porter and Kramer, 2006; Kitzmueller and Shimshack, 2012). Thus, this research shows that corporate environmental performance is evolving triggered by selected practices of the most competitive firms in their strategic group, but going further in building an environmentally based competitive advantage (Hart, 1995). Environmental initiatives can offer opportunities for advantage across all types of generic strategy.

The emergence of regulations at national and international levels can also exert pressures for coercive conformity, but also opportunities for more proactive firms, for both reactive and proactive firms (Porter & Van der Linde, 1995; Sharma & Vredenburg, 1998). According to the institutional theory, firms' operations are embedded within broader social structures comprised of different institutions. These institutions may affect firm CSR behavior and hence ESP performance (Campbell, 2007; Campbell et al., 1991). Previous studies show that the level of adoption of CSR related activities varies

significantly across countries with different regulatory conditions (Ioannou & Serafeim, 2012; Maignan & Ralston, 2002) and attribute such deviations to institutional differences (Ball & Craig, 2010; Hall & Soskice, 2001). The effect may take place through stakeholder relations as country conditions affect the information and attitudes of different constituents in addition to regulators (Aguilera et al., 2007; Jones, 1995; Morsing & Schultz, 2006). However, previous relevant studies represent social regulatory conditions as uniform aggregating a wide spectrum of institutional factors which may have different individual effects. Thus, a more focused and intuitive selection of national institutional factors is needed, better linked with the theory and the strategic behavior of firms. For instance, institutional factors such as the general environmental conditions of the country and regulatory quality may be more relevant for proactive firms. In a pro - environmental social and economic environment firms have the incentive to enter into dialogue with regulators and social groups and hence to improve their initiatives (Desai, 2016; Morsing & Schultz, 2006; Porter & Van der Linde, 1995; Sharma & Vredenburg, 1998). Law enforcement may be more relevant for reactive firms which attempt to delay or minimize their compliance.

As regards the different strategic groups, firms competing on low-cost strategies may be affected more by law enforcement rather than firms adopting a differentiation strategy. This despite the fact that cost oriented strategies can also benefit from a proactive orientation (Christmann, 2000). Low-cost strategies are likely to be associated with motives to apply the minimum possible of standards avoiding expensive aspects of regulations and taking a negative attitude against certain costly regulation, despite finally abiding to law enforced environmental regulations (Desai, 2016). Firms oriented to cost-leadership have as a primary objective the reduction of all costs including any environmental costs in order to sustain competitive parity with cost leaders. However, firms adopting a differentiation strategy are more likely to set themselves beyond regulatory compliance limits and in this way create a buffer zone against accidental violation preempting regulatory investigations and reaping the benefits of environmentally induced innovations (Desai, 2016; Kitzmueller & Shimshack, 2012;

Morsing & Schultz, 2006; Sharma & Vredenburg, 1998). For the reasons above, such institutional country factors may affect in a higher degree a specific category of firms according to its competitive strategy.

Firm specific characteristics such as corporate prosocial attitude and reputation, size, age, and financial performance have been showed to be important on corporate environmental performance (Clarkson et al., 2008; Guidry & Patten, 2012; Halme & Huse, 1997; Patten, 2002). Specifically, corporate social reputation is an asset stock built over the history of the firm (Dierickx & Cool, 1989) and is expected to exhibit a dynamic endogenous relationship with environmental performance. Firms with recognized social reputation tend to increase environmental activities as this is in line with the desired image and the traditional nexus of relations developed with stakeholders. In their effort to maintain or increase their social legitimacy and credibility against stakeholders they adopt environmental initiatives. Firms are expected to disclose financial and non-financial information both to give signals to the market about their environmental responsibility (Robinson et al., 2011) and to secure social legitimacy, as suggested by institutional theory (Oliver, 1991).

As environmental and social reputation are built over time interactively they are endogenous variables. This chapter takes the potential presence of dynamic endogeneity into account in the statistical estimates. It also includes a lagged social score to account for its effects on ESP. Further, size and age variables are also indicators of higher social visibility and may affect the environmental activities of the firm. Financial performance factors may have a significant effect on environmental performance as they portray the availability of slack resources. These resources can be used to invest in environmental activities and technologies (Belkaoui & Karpik, 1989; Perrini & Minoja, 2007). The above control factors may account for a significant part of the observed variation among the environmental practices of proactive firms.

The chapter utilizes a rich panel data set of published international data from secondary databases. These data are objective, as they are collected by a third party, the Thomson

Reuters ASSET4 database. Further data, regarding country indices are collected and retrieved from credible international organizations, such as World Bank and Yale University. Specifically the chapter utilizes an international sample comprising 3,221 firms hosted in 46 countries over the 2002-2013 period. This rich data set enables us to utilize panel data estimation methodologies and to take into account potential endogeneity.

This chapter contributes to the literature of environmental behavior of firms in several ways. First, it formulates and tests specific hypotheses based on proactive environmental behavior which is applied across different business strategy groups. It draws upon the proactivity perspective, which runs contrary to the converging forces of institutional isomorphism, linked with the generic strategies framework. To the best of our knowledge, no other study has explicitly examined the existence of accelerating environmental responses across all categories of generic strategies. This may be partly linked to imitative isomorphism, as the proactive firms monitor what the strategy leaders do and this may act as triggering mechanism initiating local search and learning. (Chandler & Hwang, 2015). However they avoid resorting to lower environmental levels as they discover the rich potential of sustainability and tend to develop a dynamic capability on their own which would provide them with competitive benefits. As such, it provides a qualifying empirical test to the proactive environmental strategy perspective linked with the generic strategies perspective (Sharma & Vredenburg, 1998). Second, it tests the effect of selected national factors on the environmental behavior. Thus, it draws upon the general social imitative and coercive pressures, in conjunction with proactive strategic behavior and competitive strategy. Third, it contributes to theory as it identifies the empirical relevance of firm specific non-isomorphic factors as opposed to factors of isomorphism, providing evidence for assessing the relative importance of converging and diverging processes.

### 3.3 Theoretical framework and hypotheses development

#### 3.3.1 Proactive environmental strategies

Environmental social performance (ESP), a key pillar of the wider corporate social responsibility (CSR) is increasing in business practice in the last two decades. What is interesting is the intensity and breadth of the practices of some leading firms, accompanied by national and international policies which shape a changing institutional environment (Nijhof & Jeurissen, 2010; Pless et al., 2012; Waldman & Siegel, 2008). These may arise out of increasing social demands (Zadek, 2004), the strategic behavior of firms to preempt negative future activism (Baron, 2001), or because some companies have found ways to innovate through CSR thus changing the competitive balance (Kitzmueller & Shimshack, 2012). As Drucker (1993) put it long ago, using their imagination some have turned a social problem into a business opportunity. Regardless of motives they have established a unique advantage usually associated with more profits. Indeed the meta-studies by Margolis & Walsh (2003) and Orlitzky, Schmidt, & Rynes (2003) have shown that, though CSR is not clearly associated with more profitability, nevertheless there is a modest positive relation between social and financial performance under certain conditions (Kitzmueller & Shimshack, 2012).

The competitive advantage imperative has been a legitimization force for undertaking ESP, or more widely CSR activities. It is a basis for company success in the market place, without which the company may not sustain but limited CSR levels (McWilliams & Siegel, 2011). Firms engage in CSR investing more in their social component of strategy when they foresee a potential return on its investment (Waldman & Siegel, 2008). This does not preclude firms to be driven by social objectives and values not directly justified by competitive advantage, creating their own paths to advanced levels of CSR– led innovation. These companies form the so called sustaining corporation as (Dunphy et al., 2007) have classified it, or undertake joint value creation (Porter & Kramer, 2006) (e.g. Body Shop), or achieve a lead in proactive environmental strategies. But the commercial

logic of competitive advantage, either as a prime motivator or enabling factor, is a necessity for success. The chances to be competitive by undertaking CSR must be created, not found. In the CSR journey some companies generate or discover opportunities to enhance their competitive stance (Dunphy et al., 2007; Nijhof & Jeurissen, 2010; Porter & Kramer, 2006). This may happen without abandoning their generic competitive strategy.

Proactive corporate environmental strategy is linked with the development of organizational capabilities which confer competitive benefits (Aragón-Correa & Sharma, 2003; Murillo-Luna et al., 2008; Sharma & Vredenburg, 1998). Proactive firms with positive attitudes towards environmentalism have an inclination to produce changes endogenously rather than as a response to compliance to regulations (Correa & Sharma, 2003). They develop a dynamic capability which takes a path-dependent unique form, linked with environmental initiatives. This can be attributed to benefits arising from collaboration with stakeholders, feedback and learning from the actions and initiatives undertaken and continuous innovation. These form a nexus of interlinked capabilities which would lead to competitive benefits through environmental responses (Hart, 1995; Sharma & Vredenburg, 1998).

The dialogue with stakeholders and integration of their view and ideas create a capacity for joint problem solving and opportunities for joint value creation (Porter & Kramer, 2006). When the attitude to dialogue and integration of stakeholders is positive, the behavior of regulators and other groups becomes supportive seeking joint solutions in environmental problems (Desai, 2016; Sharma & Vredenburg, 1998). The firm develops a unique path, looking for its own or joint with stakeholders solutions and learning from experience. This leads to higher-order learning (Daft & Weick, 1984; Fiol & Lyles, 1985; Schon, 1978). Learning involves knowledge development, reorientation and positive transformation of values. This triggers a series of innovations and may lead to competitive benefits enabling the firm to stay ahead of competitors. Innovations accumulate as the firm starts the sustainability journey. So, proactivity becomes an orientation manifested

in a series of environmental initiatives and actions, which becomes a firm specific asset stock (Dierickx & Cool, 1989).

The positive environmental response can confer benefits for any type of strategy. (Christmann, 2000) for example, has indicated that environmental best practices can contribute to cost advantage. Innovation and learning is directed to cost reduction and efficiency. The same can occur for differentiation, when firms change their products to introduce “green” attributes. There is a commonality of actions across generic strategies on certain aspects e.g. waste reduction, emission control, energy consumption and others can contribute to all, for any type of strategy. The link with generic strategies has not been explicitly investigated in the literature, except for the Miles and Snow proactive strategy (Aragón-Correa, 1998).

A turning point in the behavior of firms may be the ESP/CSR level and practices of the strategic leader(s) in the same generic strategy group. This may hold across generic strategies. Firms look what the strategic leaders do as their performance legitimizes the environmental practices they undertake. However, strategy leaders are not necessarily environmental leaders. For instance, luxury firms (leaders in differentiation) have been criticized as lagging in sustainability levels (Kapferer, 2010). So, when firms identify that they exceed the environmental level of these competitors it is likely to have discovered the world of ESP-led innovation, taking their own initiatives and generating unique environmental friendly solutions. Investing in other practices rather than in capabilities linked with the competitive advantage often leads to failure, so a successful firm is the one that reinforces its capabilities (Grant, 1991). This leads us to the following proposition:

*Proposition: The greater the lead of the ESP of a firm above the ESP level of the strategy leader in its respective strategic group the more it invests in ESP to enhance its lead.*

This proposition is likely to hold for both cost leadership, differentiation and hybrid groups. It is more likely to create or find more opportunities in differentiation than in cost leadership, as the latter is restricted in breadth of search being limited by the cost reduction constrain. Cost innovations are also more likely to be copied and form a standard for all companies in the group. Innovations for differentiation are more likely to have more variety, ranging from new green products to enhancement of social attributes, and therefore are more difficult to copy.

For the above reasons we expect that when a firm following a cost leadership strategy tracks that it employs higher ESP than the cost leader, this difference may be taken to indicate its cost advantage and motivates it to reinforce its ESP. This may happen by adopting several environmental practices which are directed to low cost strategy (Christmann, 2000). For instance, a cost leader may find new ways for cost innovation and cost reduction, often going beyond mere resource savings known in the market place, e.g. materials sourcing and use, substitution and recycling, energy conservation, lean and green production technologies, better product designs and green innovations, better value chain arrangements. Many environmental friendly solutions can reduce cost, enhancing the competitive position of the firm (Hart, 1995; Hart & Milstein, 2003; Shrivastava, 1995) and being in line with the beneficial capability of continuous improvement (Hart, 1995).

So the following hypotheses are advanced:

*H1: The greater the distance of the environmental practices of a firm from the environmental practices of the cost leader in its specific cost-related strategic group, the higher the environmental performance it will exhibit.*

Similarly, leaders in product differentiation may find ways to deepen and expand their difference in ESP from competitors. The continuous innovation capability allows firms to stay a step ahead of competitors that lack in this capability (Sharma & Vredenburg,

1998). Indeed engaging in CSR has been mostly seen to be associated with efforts to be different from competitors by introducing new offerings and product innovations often at a higher cost. Differentiation leaders realize new innovative ways to strengthen their advantage or to introduce green product portfolios and policies aimed at niche markets segments (Govindarajan & Srinivas, 2013; Hull & Rothenberg, 2008; Kitzmueller & Shimshack, 2012; Reed, 2002; Shrivastava, 1995).

*H2: The greater the distance of the environmental practices of a firm from the environmental practices of the differentiation leader in its specific differentiation strategic group, the higher the environmental performance it will exhibit.*

### 3.3.2 Country effects

At the country level the institutional context is important in driving firm behavior as it can exert coercive and normative pressures. Regulatory policies, rules and norms advanced by national institutions create a climate which affects all stakeholders. Proactive firms may develop a dialogue with regulators and other stakeholders engaging them in their environmental strategies (Morsing & Schultz, 2006). Through active stakeholder involvement they may find opportunities for further initiatives and joint value creation (Desai, 2016; Porter & Van der Linde, 1995; Sharma & Vredenburg, 1998). Many of the existing environmental standards may bite all firms, reactive and proactive, e.g. emission controls and solid waste. But proactive organizations are likely to move beyond compliance, undertaking initiatives and entering into dialogue for better implementation with regulators.

Law enforcement in implementing compulsory regulations, exert pressures for firm compliance which may be particularly biting for firms adopting a negative attitude towards regulations. Firms however vary as in compliance with regulatory mandates and in attitudes against them (Desai, 2016). Although compliance with enforced regulations

portray coercive characteristics (DiMaggio & Powell, 1983; Oliver, 1991), responses of proactive firms differ from those of reactive firms. Regulations are likely to affect reactive firms, especially those with a low cost orientation which may be lagging in some costly compliance with the regulations. These firms are likely to typically comply with the minimum requirements set by regulations in order to maintain low costs or to comply symbolically rather than substantively (Desai, 2016). However Porter and van der Linde (1995) argue that environmental regulations provide firms with opportunity to improve their efficiency (e.g. in energy use). Non-low cost firms, and more likely firms adopting differentiation as their business strategy, are likely to be more proactive often moving beyond compliance. They want to enhance the importance of their environmental image perceived by the public in order to create a buffer against public criticism (Baron, 2001). But improved level of environmental performance may be the result of experience with innovations (Kitzmueller & Shimshack, 2012; Sharma & Vredenburg, 1998).

Certain national context factors are examined affecting the overall business environment and other related to law enforcement. Such factors related with public policies and soft regulations are represented by the *environmental performance index* (EPI) of the country. Public policies pushing towards sustainability are likely to influence firms to adopt environmental practices regardless of their actual efficiency implications (DiMaggio & Powell, 1983). Motives vary, and can be instrumental or altruistic. Also the *openness of the economy* to international trade introduces the effects of the EPI of other countries. Trade liberalization is expected to influence the levels of environmental performance as environmentally friendly procurement and production is in demand in international trade (Flammer, 2015). Openness of the economy can be measured by international trade activity (imports plus exports) over GDP. Another factor is the *regulatory quality* of the country, and the associated the *law enforcement*. Institutional theory suggests that national environments exhibiting high quality of regulations and law enforcement exert higher pressures on firms to comply. However, motives vary across proactive firms, with some being instrumental and others involving altruistic or normative components

(Aguilera et al., 2007; Egri & Herman, 2000; Freeman et al., 2000; Lindenberg & Steg, 2007; Papagiannakis & Lioukas, 2012).

Firms which exceed their strategy leaders in ESP are likely to be positively affected by the national environment and less affected by law enforcement as they move beyond compliance. These arguments lead to the following hypotheses:

*H3: The higher the indices of regulatory quality, law enforcement, country environmental performance, openness of the economy and regulatory quality the higher the environmental performance of the firm for any generic strategy.*

*H6: The more strict the law enforcement the higher the environmental performance of only firms with low cost orientation.*

### 3.4 Methods, variables and sample

#### 3.4.1 Econometric model

The following generic panel data regression model is adopted to explain the observed environmental scores at the firm level:

$$y_{it} = \mu + \alpha_i + \alpha_t + \sum_{g=1}^G \beta_{gi} x_{git} + \sum_{k=1}^K \gamma_{ik} z_{kt} + u_i + \varepsilon_{it}; \quad (1)$$

$s_{it} \sim i.i.d. (0, \sigma_\varepsilon^2)$ ,  $E(u_i) = 0$ ,  $E(u_i^2) = \sigma_u^2$ ,  $E(s_{it} u_j) = 0$ , for  $\forall i, t, j$ ;  $E(u_i u_j) = 0$ , if  $i \neq j$

where  $i=1, 2, \dots, n$  identifies the firm;  $t=1, 2, \dots, T$  denotes the year;  $y_{it}$  is the environmental score of firm  $i$  in year  $t$ ;  $x_{git}$  is a matrix of  $G$  explanatory variables that includes controls for the social score, age, size (employees), financial slack (cash reserves over total assets) and firm performance (return on assets);  $z_{kt}$  is a matrix of  $K$  firm-invariant explanatory variables for the country indices used;  $\alpha_i$  and  $\alpha_t$  are constant terms that allow for the

possibility of (constant) heterogeneous behaviour between the firms ( $\alpha_i$ ) and over the yearly time periods ( $\alpha_t$ ), respectively;  $\beta_{gi}$  measures the effect that the  $g^{\text{th}}$  explanatory variable has on the environmental score of firm  $i$ ;  $\gamma_{ik}$  estimates the sensitivity of the environmental score of firm  $i$  on the  $k^{\text{th}}$  variable;  $\varepsilon_{it}$  is a white noise error term following a distribution with mean zero and variance  $\sigma_\varepsilon^2$  and represents the within-firm errors; and  $u_i$  represents the between-firm errors.

As the dataset comprises both cross-sectional and time series observations, panel data regressions are adopted to estimate equation (1). To select between the fixed-effects and random-effects specifications of the panel data estimation methods, the (Hausman, 1978) test is conducted to test the null hypothesis that the preferred model is the random effects vs. the alternative of fixed effects model<sup>1</sup>. The performed estimations control for firm, country, industry and year fixed-effects. With respect to the estimation of standard errors, (Petersen, 2009) shows that in panel datasets when estimating fixed effects models, firm or time clustering of standard errors individually may lead to biased standard errors. Avoiding such bias involves the estimation of both firm and time dimensions cluster-adjusted standard errors (see (Petersen, 2009) and (Thompson, 2011), which is adopted in the fixed-effects regressions of this chapter.

### 3.4.2 Variables

All  $x_{git}$  and  $z_{kt}$  variables in equation (1), their precise definitions, and their a-priori expected signs are presented next and summarized in table 3.1. **Dependent Variable:** *The environmental score*, defined as the score assigned by ASSET4 to the focal firm for the environmental pillar of its ESG score. **Strategy variables include:** (1) *Distance from cost leader (Env Gap Cost)*, defined as the squared difference of environmental score between

---

<sup>1</sup>Once selected, the fixed- or random-effects specification is tested against a pooled OLS specification through the following: (1) a separate F-test for the fixed-effects ( $H_0: \alpha_i = 0$ , for  $i=1, \dots, n$ ) and the time-fixed effects ( $H_0: \alpha_t = 0$ , for  $t=1, 2, \dots, T$ ) specifications versus a pooled OLS specification and (2) the (Breusch & Pagan, 1980) Lagrange Multiplier (LM) test for the random-effects versus a pooled OLS specification. The results of these tests are not reported to preserve space but are available from the authors upon request.

the focal firm and the cost leader divided by the environmental score of the cost leader. For each industry-year pair of the sample the cost leader is defined as the firm exhibiting the maximum ratio of cost of goods sold over sales. A positive sign is expected as the greater the distance of environmental score from the cost leader, the higher the inclination for the focal firm to increase its environmental activities. (2) *Distance from differentiation leader (Env Gap R&D Diff)*, defined as the squared difference of environmental score between the focal firm and the differentiation leader divided by the environmental score of the differentiation leader. This R&D expenses/Sales ratio is a proxy for innovative differentiation (McWilliams and Siegel, 2001). In addition, a second Distance from differentiation leader (*Env Gap Markt Diff*) refers to the gap based on the marketing expenses. This Marketing expenses/Sales ratio is a proxy for marketing differentiation (Spanos et al., 2001). For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of R&D expenses over sales. Again, a positive sign is expected as the greater the distance of environmental score from the differentiation leader, the higher the inclination for the focal firm to increase its environmental activities. **Firm-related factors include:** (1) The *social score*, defined by ASSET4 as a score that “measures” a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.” The expected sign is positive because the larger the social score of a firm, the higher its inclination to environmental performance. (2) The *Age*, defined as the logarithm of the years from the inception of the firm as provided in the firm's financial statements. A positive sign is expected because well-established firms have built reputation and therefore are inclined to more environmental activities. (3) The *size* of the firm, which is represented by number of employees for the firm (in log form). Again, a positive sign is expected because with size firms are expected to be more likely to exhibit higher involvement in environmental practices.

(4) The (financial) *slack*, defined as the ratio of cash and cash-equivalent items over total assets from the balance sheet statement of the focal firm. The expected sign is positive, as higher levels of slack are expected to be associated with higher levels of environmental score because the firm has more available resources to allocate for its environmental activities. (5) The *return on assets (ROA)*, defined as net income over total assets. A positive sign is expected because with greater profitability more resources are available to be invested in non-financial reporting activities. **Country factors:** (1) The *environmental performance index (EPI)*, which reflects the level of firms' environmental practices and awareness within the host country. The expected sign is positive because countries that exhibit higher levels of environmental awareness tend to be host countries for firms that are engaged more in environmental-friendly practices. (2) The *openness ratio* =  $((imports + exports) / GDP)$  is defined as the summation of imports and exports over the GDP of each country in the sample. A positive coefficient of openness is expected because firms operating within countries that exhibit higher levels of trade liberalization tend to adopt CSR practices and non-financial reporting to a greater extent (Flammer, 2015). (3) The *regulatory quality index*, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development in compliance with environmental regulations. A positive sign is expected as higher values of the index indicate higher regulatory quality and thus increase the possibility of higher adoption of environmental practices. (4) The *rule of law index*, which captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Again, a positive sign is expected as higher values of the index indicate higher rule of law and thus increase the possibility of higher adoption of environmental practices.

### *3.4.3 Endogeneity issues*

In the estimation setting of equation (1), endogeneity issues can arise among environmental score and social score (corporate reputation) because of simultaneity bias, reverse causality and omitted variables problem. For this reason, the social score appears in our initial panel data estimations with a two periods lag. In this way, social score is predetermined, and any simultaneity bias is mitigated. Further, the use of fixed effects panel data regressions accounts for the omitted variables issue by introducing country, industry and year dummies. However, the use of lagged values and the use of fixed effects regressions are not perfect remedies for endogeneity because it may be the case that both environmental performance and corporate reputation are correlated with a third common but omitted variable or exhibit reverse causality. For this reason and due to the possible effect of past environmental performance on reputation, we follow (Surroca et al., 2010) and regress reputation on increasingly higher-order lags of environmental score until no further significant improvement in  $R^2$  was observed (Roberts & Dowling, 2002). There are no significant increases in  $R^2$  beyond two lags. Thus, we calculate the residual of social score as the difference between social score and the predicted value found in a specification of environmental that included up to two lags of that variable. This residual lagged by two periods is our measure of reputation and enters our estimations.

### *3.4.4 Data and sample*

The main source of the panel data set used in this chapter is the Thomson Reuters ASSET4 database, which provides environmental, social and corporate governance data (ESG) for over 4,000 firms worldwide, starting in 2002. The main clients of ASSET4 ESG scores are professional investors seeking to integrate ESG data into their portfolio investment analysis. Thomson Reuters assigns trained research analysts to collect more than 900 evaluation points for each firm under the requirement that all of the data incorporated into the evaluation points are publicly available. However, the resulting ESG evaluation points do not share the same standardization worldwide, even if there are efforts towards

this direction – see, e.g., the recent proposal for the (EU Directive, 2014) focusing on non-financial reporting. Due to this lack of common standards and to enable comparability of the collected data, ASSET4 incorporates the collected evaluation points into consistent ESG scores to enable quantitative analysis and comprehensive comparisons. For example, the environmental evaluation points typically include information on energy used, water recycled, carbon emissions, waste recycled, and pollution. Subsequently, every year the 900 evaluation points are used as inputs to a specific weighted formula to calculate 250 key performance indicators (KPI's), which are further classified into 18 categories within four pillars: environmental, social, corporate governance and economics. According to ASSET4's documentation, in a given year, each firm receives a z-score for each of the four pillars. This z-score represents a firm's relative ranking against the other firms based on the information available until the previous year.

We start with the universe of ASSET4's database, which comprises 60 countries and a total of 4,521 firms during the 2002-2013 period. However, after excluding firm without available data for environmental score, the main variable of this chapter our sample deteriorates to 39 countries which account for 3,238 firms. The final sample of countries covers the great majority of the developed and emerging economies around the globe. Firm-wise, the sample utilized in this chapter covers 71.62% of the total available firms in the ASSET4 database. In terms of number of observations, the starting panel data set comprises 55,296 firm-year observations and the final sample comprises 18,426 firm-year observations. This is due to a considerable number of missing values for some of the variables used which limits the available observations for estimation purposes. Thus, our final sample comprises an unbalanced panel data set.

This dataset is subsequently matched with firm-level data provided by ASSET4, Datastream and WorldScope databases on the social score (reputation), the firm age, the number of employees, the ratio of the item cash and cash equivalents from the WorldScope database (item WC02005) over the item total assets (WC02999) is to account for firms' financial *slack* and the ratio of EBITDA (item WC18198) over total assets (item

WC02999) to compute the return on assets (firm performance). The sector classification follows the industry classification benchmark (ICB) provided by the WorldScope database (item WC07040). The first level of ICB classification is used, which comprises the following broad sectors: basic materials, consumer goods, consumer services, financials, healthcare, industrials, oil and gas, technology, telecommunications and utilities.

To account for national context factors, which may affect environmental scores at the firm level, we introduce a set of country indices, such as the following: the environmental performance index (EPI), which is published by Yale University<sup>2</sup>; the level of openness of the economy, defined as the ratio of ((imports + exports) / GDP), computed with data obtained from Datastream; and the regulatory quality and rule of law indices published by the World Bank (reference here). Finally, to mitigate the effect of potential outliers, all variables are winsorized<sup>3</sup> at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

Table 3.2 shows the distribution of the firm-year observations for the final sample across industries, years and countries. Panel A of table 3.2 reveals a representation of different industries in the sample. Industrial and consumer services firms are the most represented industries in the sample with 3,956 and 2,768 firm-year observations, respectively. In contrast, utilities and telecommunications are the least represented industries with 762 and 453 firm-year observations, respectively. Panel B of table 3.2 shows that apart from the first two years of the sample (2002-2003), there is a steady and growing availability of firm-year observations from 1,200 observations in 2004 to 2,397 observations in 2012. Panel C of table 3.2, reports the distribution of the firm-year observations according to the host country of the firms. The US, Japan and the UK are the most-represented countries with 6,925, 2,932 and 1,904 firm-year observations, respectively, whereas

---

<sup>2</sup>According to the EPI Yale University website (<http://epi.yale.edu/>, last accessed: 7th of April 2014): “The EPI index ranks countries on performance indicators tracked across policy categories that cover both environmental public health and ecosystem vitality. These indicators provide a gauge at a national government scale of how close countries are to established environmental policy goals.”

<sup>3</sup>Winsorizing, sets all the data points less than the 1<sup>st</sup> percentile of each variable equal to the 1<sup>st</sup> percentile and all the data points exceeding the 99<sup>th</sup> percentile equal to the 99<sup>th</sup> percentile, thereby excluding extreme observations from the sample.

Colombia, New Zealand and Thailand are the least-represented countries with 16, 9 and 9 observations, respectively.

### 3.5 Results

Tables 3.3, 3.4 and 3.5 present descriptive statistics for the variables included in the sample, regarding for firms exceeding in ESP in comparison to the respective strategy leaders and that belong to the low cost, innovation differentiation (R&D) and marketing differentiation group, respectively. In table 3.3, environmental score exhibits mean value 0.70 and standard deviation equal to 0.27. The mean value for the Env Gap Cost variable is 0.77 and the median is significantly lower and equal to 0.15 indicating the presence of positive outliers in the sample. It also exhibits high standard deviations, equal to 1.20. The mean value and the standard deviation for social score are equal to 0.03 and 0.20 respectively. The mean age of the firms is 24.11 years with a standard deviation of 12.34 years. The mean number of employees is 37,485.95 and the median value is 15,259.5. The Cash over Total Assets (slack) ratio has a mean value of 0.13. Regarding the ROA score, the mean value is 0.09. Turning to the country indices, EPI index, Openness, regulatory quality and rule of law have a mean value of 71.02, 0.51, 1.37 and 1.44 respectively. In table 3.4, the mean value of the environmental score is 0.77 and the standard deviation is 0.23. The Env Gap R&D Diff variable exhibits a mean value of 0.55 and a median value of 0.10. The social score variable exhibits a mean value 0.02 and a median value of 0.06. The mean age of firms is 17.46 and the standard deviation is 2.62. The number of employees, have the mean and median value of 40,247.19 and 18,500 respectively. Regarding the Cash/Total Assets and the ROA score the mean value is 0.15 and 0.09 respectively. EPI index, Openness, regulatory quality and rule of law have a mean value of 71.23, 0.49, 1.35, 1.46 respectively. In table 3.5 the mean value of environmental score is 0.70 and the standard deviation is 0.27. The Env Gap Mrkt Diff variable exhibits a mean value of 0.68; The mean value of social score is 0.02 and the standard deviation is 0.21. The mean age of firms is 24.13 with a standard deviation of 12.45. The mean number of

36,935.28 employees and the median equals to 15,176.5. The Cash/Total Assets and the ROA score have the mean value of 0.12 and 0.09 respectively. Last, the mean value for the country indices, EPI index, Openness, regulatory quality and rule of law have a mean value of 71.02, 0.50, 1.38 and 1.45 respectively

In table 3.6, 3.7 and 3.8 pair-wise correlations among all variables are presented. To mitigate any multicollinearity concerns, we avoid using simultaneously in our estimated models pairs of variables that exhibit linear correlations in excess of 0.6. The only pair of independent variables exhibiting a linear correlation in excess of 0.6 is the regulatory quality and rule of law indices with a correlation coefficient of 0.86, 0.87, 0.88 respectively for each table (3.6, 3.7 and 3.8). Thus, these indices are used interchangeably in our estimated models. We report only the most parsimonious models in terms of individual significance (t-statistics) and maximization of the adjusted R<sup>2</sup>.

Columns P1 and P2 of table 3.9 and P3 to P6 of table 3.10 present the main results of this chapter exploring the relationship between environmental scores and strategy-based variables, while controlling for social reputation, firm characteristics and exploring the effect of national context variables. Columns P1 and P2 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Cost of Goods Sold/Sales ratio which is used as a cost leadership indicator. Thus, P1 and P2 specifications include the Env Gap Cost variable as defined earlier in the chapter. Similarly, columns P3 to P6 refer to differentiation leadership, using two indicators. In specific, columns P3 and P4 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Env Gap R&D Diff variable (R&D expenses/Sales ratio), when columns P5 and P6 report the results based on increasing quartiles (high >75% and medium 25 to 75%) of the Env Gap Market Diff (Marketing expenses/Sales ratio).

Columns P1, P3 and P5 are of particular importance as they refer to the estimation of the model for the sub-samples of cost leaders and differentiation leaders, respectively (i.e. firms exhibiting the highest quartile of the COGS/Sales ratio, R&D expenses/Sales ratio and Marketing expenses/Sales ratio, respectively). In column P1, the coefficient of the

Env Gap Cost variable is positive and highly significant (0.056, t-stat = 6.921). The same pattern holds in column P3 for the R&D differentiation leaders, where again the Env Gap R&D Diff variable exhibits a positive and highly significant coefficient (0.044 and t-stat = 4.639) and in column P5 as well, for the marketing differentiation leaders, where the coefficient of the Env Gap Markt Diff variable is positive and highly significant (0.042 and t-stat = 15.448).

There are similar results regarding the sub-samples of the medium quartiles (25 to 75%) of each leadership group, in columns P2, P4 and P6. In column P2, the coefficient of the Env Gap Cost is positive and highly significant (0.026 and t-stat 6.106). The coefficient is positive and highly significant in P4 for Env Gap R&D Diff variable (0.030 and t-stat 3.375) and in P6 for Env Gap Markt Diff variable (0.039 and t-stat 7.969).

In all P1 to P6 panel data estimations presented in tables 3.9 and 3.10, we include the two-period lagged value of social score, for endogeneity bias issue. The coefficient of social score is not significant in all P1 to P6 specifications. In addition, some of the coefficients of the firm-specific control variables exhibit the a-priori expected positive signs and are significant: the logarithm of the age of the firm is significant and positive in P2, P5 and P6 specifications; the logarithm of the employees is positive and significant in all P1 to P6 specifications; the logarithm of the ratio cash over total assets (slack) is significant only in P6 but carries an unexpected negative sign and the return on assets is insignificant in all P1 to P6 specifications. From the country-specific indices, the coefficient of the environmental performance index is significant and positive in P3 and P4, the openness ratio is significant and positive in P4 specifications, whereas the rule of law coefficient is significant and positive in P4 and P5 specifications. Due to the aforementioned high linear correlation between the regulatory quality and rule of law indices, we only include the rule of law index in all specifications of tables 3.9 and 3.10. This is because when estimating the model with the regulatory quality index instead of the rule of law index the overall explanatory power of the estimated model, measured by the adjusted  $R^2$ , was lower.

We include country, industry and time fixed effects, which account for unobserved heterogeneity in the sample examined. The number of observations is significantly lower than the whole available sample in all P1 to P6 specifications. This is due to the restriction of the sample in the respective quartiles (high and medium) and the use of lagged values in the explanatory variables.

### **3.6 Discussion and conclusion**

The current research contributes to the linkage between generic strategic framework and proactive environmental strategies by analyzing possible mechanisms that firms use to direct their local search and learning. In this way it provides an example of possible learning mechanisms in the framework suggested by Chandler and Hwang (2015). The present framework assumes that competitive and benchmarking is directed to the best competitors in the specific strategic group in which the company belongs. It assumes that firms are monitoring the leaders in the strategic group in which they belong searching for cues about best environmental practices. These in turn act as trigger for further in house developments of proactive environmental strategies.

Results show that the difference of the focal firm's ESP from the strategic leader's ESP have a positive statistically significant effect on the focal firm's future ESP. For proactive firms which exceed the ESP of the strategic leaders, results are clearcut and strong across strategic groups. The environmental gap has indeed a significant effect on ESP, indicating proactive behavior rather than imitation. This holds for both cost leadership and differentiation leadership groups. Thus, proactive rather than imitative strategies seem to prevail, suggesting that firms with ESP above the competitive strategy leaders are strengthening their lead rather than regressing to the lower ESP levels of strategic leaders. The reasons may be that as they enter into the world of sustainability, they are discovering new opportunities to create advantage through collaboration with stakeholders, feedback and learning from the actions and continuous. Results provide evidence which can be taken to support this process, providing full support to the

proposition of the chapter. Thus it confirms arguments such as those advanced by (Aragón-Correa & Sharma, 2003) who support that proactive firms have an inclination to produce changes endogenously. Results suggest that proactive firms develop a dynamic capability for environmental actions, which takes a path-dependent unique form. This is in line with (Sharma & Vredenburg, 1998) who argue that firms form a nexus of interlinked capabilities which leads to competitive benefits through environmental responses. Our results show that this occurs across different generic-strategy groups. So they are in line with (Christmann, 2000) for low cost practices and (Kitzmueller & Shimshack, 2012), for environmentally linked competitive advantage.

We have not found an indication of convergence to the strategy leaders ESP levels, which would indicate isomorphic forces at work. Probably firms exceeding in ESP gradually become autonomous as they realize that the world of sustainability provides opportunities to further increase their competitive advantage. The chapter started with a theoretical framework that balances two competing forces, imitative convergence to the industry leaders and proactivity. Monitoring of best practices with focus on the industry leaders may indeed take place, acting as trigger mechanisms and setting in motion local learning and further environmentally induced innovations. It is argued that firms choose as a benchmark for best practices the strategic leader in the strategic group that they belong. In case they detect that they have more efficient and rich environmental practices than the leader, they may search for selective practices in which they lag. In total however they initiate an independent dynamic path which abandons convergence to the standards set by the industry leader. Instead, they accelerate further investing and strengthening environmentally linked competitive advantages. The sustainability model to which they ascribe provides opportunities for green innovations, green marketing and green production technologies (Govindarajan & Srinivas, 2013; Hull & Rothenberg, 2008; Kitzmueller & Shimshack, 2012; Reed, 2002; Shrivastava, 1995). These constitute diverging processes generating differences among firms.

Regarding the national factors included as possible determinants of the environmental performance at the firm-level results are mixed. Significant indicators are the openness of the economy and rule of law (or the regulatory quality) obtained only with one indicator, R&D expenses/Sales for the middle differentiation group. For the same indicator the coefficient of EPI is negative for all R&D groups. This is surprising as the Environmental Performance Index of the country (EPI), gives a measure of sustainability policies in the country. This could be attributed to the fact that EPI is a gross national indicator, not necessarily relevant to the specific environment of the firms, which is sector-specific. Also it may be that this indicator is less reliable to distinguish strategic groups. For other indicators results are insignificant for all groups. So overall it appears that country level variables are not strong determinants. In order to capture such sectoral differences we introduce sector dummies in all estimations. Indeed these dummies are jointly significant and justify their inclusion in the model.

Regarding firm specific variables, the social score is significant in most equations where the focal firm lags in ESP in comparison with the strategic leader in the group. This obtains for cost leaders and the middle cost group, for non - differentiation and middle differentiation groups (for R&D indicator) and across all groups for the marketing differentiation. This variable indicates that social reputation has a dynamic effect, exerting its influence on the environmental performance. As explained earlier in the chapter we follow (Surroca et al., 2009) to account for possible endogeneity issues. As suggested by signaling theory reputable firms choose to disclose more information regarding their environmental activities to send certain signals to the market, to preserve or enhance their pro - social image and corporate reputation (Robinson et al., 2011). Next, the age variable is shown to have a significant positive effect in middle cost groups and in the non – cost leaders group for both firm under and over the strategic leader, and for middle differentiation and non – differentiation groups lagging in ESP. This result can be attributed to the fact that older firms are more widely known with vested stakeholder relationships, and hence have significant incentives to exhibit higher environmental engagement. In turn, firm's size has a strong significant effect in all equations indicating

that larger firms are more advanced in environmental practices. This may be a result of the visibility that large firms attract and their desire to obtain and preserve social capital. Regarding other firm level controls, cash over total assets and firm performance give rather weak and mixed results. Overall firm specific variables are important, and account for a significant part of the heterogeneity in firms environmental practices.

It is also important to note that specific firm variables are significant determinants of environmental conduct of firms. They explain significant part of the heterogeneity among firms, and suggest that size is strong determinant, and age also in some of the groups. The social score is insignificant in all groups.

Overall, the results have important theoretical implications. They suggest that proactive forces operate in all strategy groups, with many firms becoming autonomous, internally generating environmental initiatives and innovations. At a theoretical level the results support the view that for proactive firms imitative isomorphic forces may not be so important except to the extent that the competitive benchmarking acts as trigger mechanism. Firms leading in ESP seem to find their own way of gaining competitive benefits through environmental initiatives. The world of sustainability as it unravels produces opportunities for learning and innovation, leading to competitive advantage.

The results of this research would be a practical value for managers. They highlight that competitor monitoring does not imply only imitation mechanisms. Success cannot be achieved by becoming a mime that accepts and imitates uncritically the practices of the strategic leader. Every good practice of the competitors would provide opportunities and deserves attention and critical evaluation of its potential in the idiosyncratic context of the firm in focus. Firms should have the capacity to distinguish their competitive lead in comparison to the strategic leaders and invest on practices in which they lag, or further invest in environmental innovations in which they exceed. Certainly strategic leaders usually follow an array of environmental practices striking a balance between social and economic considerations which leads to competitive advantage and related benefits. However their environmental strategy is not easy to track and imitate because they

protect their advantage and the tacit knowledge associated with competitive advantage. This research comes to remind that even incomplete monitoring may provide triggers for environmentally proactive firms to further increase their advantage. Monitoring of strategic leaders and competitive analysis is not only an imitating procedure that leads firms to resort to the leader. Competitive analysis could indicate the gaps of the focal firm comparatively to their lead business opening avenues for creativity and innovation. Proactivity in environmental behavior is unique and path dependent enhancing the generic strategy of the firm. Best performing competitors may serve to give the firms the opportunity to discover their competitive advantage and invest on that. So, this research highlights the important dynamic role of proactivity in building environment - related competitive advantage.

The research however has certain limitations. We should note that in the chapter we have classified firms into groups with low cost (cost leaders), middle and non-cost orientation according to the ratio of cost of goods sold over sales (COGS/Sales). We also classified firms similarly according to their differentiation strategy utilizing two sector adjusted ratios: the R&D expenses over Sales (Hambrick, 1983; Spanos et al., 2004), and the marketing expenditure over Sales. Other indicators or even qualitative information may be used to better discrimination of strategic groups.

Another limitation of this research is that only the index of the total environmental score is used as the dependent variable. So, it would be very interesting for future research to distinguish in a second level separate environmental performance aspects and to see whether the arguments of proactivity hold for all of them. For example, in the case of cost leadership indices like reduced costs from energy, waste, material or water savings could be examined. Similarly, in the case of differentiation leadership, research could be focused on environmental innovation, R&D or marketing environmental practices.

**Table 3.1: Explanatory variables of environmental score**

| Types of variables              | Description   | Expected Sign |
|---------------------------------|---|---------------|
| <b>Dependent variable</b>       | <i>Environmental score</i> : The score assigned by ASSET4 database for the environmental pillar of each firm.   |               |
| <b>Distance from the leader</b> | <i>Distance from cost leader (Env Gap Cost)</i> : This is the squared difference of environmental score between the focal firm and the cost leader, divided by the environmental score of the cost leader. For each industry-year pair of the sample the cost leader is defined as the firm exhibiting the maximum ratio of cost of goods sold over sales.  | +             |
|                                 | <i>Distance from differentiation leader (Env Gap R&amp;D Diff)</i> : This is the squared difference of environmental score between the focal firm and the differentiation leader, divided by the environmental score of the differentiation leader. For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of R&D expenses over sales.                              | +             |
|                                 | <i>Distance from differentiation leader (Env Gap Markt Diff)</i> : This is the squared difference of environmental score between the focal firm and the differentiation leader, divided by the environmental score of the differentiation leader. For each industry-year pair of the sample the differentiation leader is defined as the firm exhibiting the maximum ratio of marketing expenses over sales.                          | +             |
| <b>Firm-specific factors</b>    | <i>Social score</i> : The social pillar score, assigned by ASSET4 to each firm in the sample, measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. | +             |
|                                 | <i>Age</i> : The number of years the firm operates.   | +             |
|                                 | <i>Employees</i> : The total number of employees as reported in Datastream database.  | +             |
|                                 | <i>Cash and cash equivalents / Total Assets (Cash_TA)</i> : This is the ratio of item (WC02001) over item (WC02999) of Worldscope database which account for cash and due from banks for banks in the sample, cash for insurance companies in the sample and cash and short term investments for all other industries in the sample and total assets, respectively.   | +             |
|                                 | <i>Return on assets (ROA)</i> : The ratio of net income over total assets. It is used as an indication of profitability.  | +             |
| <b>Country factors</b>          | <i>Environmental performance index (EPI)</i> : This is an index published by Yale University representing the overall environmental performance of a country.   | +             |
|                                 | <i>Openness ((imports+exports)/GDP)</i> : This is the ratio of the summation of imports and exports over the total GDP of a country's economy. It is used as a measure of an economy's openness and international trade.  | +             |
|                                 | <i>Regulatory quality</i> : This is an index, published by World Bank, which reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Higher values of the index indicate higher regulatory quality.   | +             |
|                                 | <i>Rule of Law</i> : This is an index, published by World Bank, which captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Higher values of the index indicate higher rule of law.   | +             |

**Notes:** This table lists all the explanatory variables examined in this chapter as possible determinants of the environmental score. The column "Expected Sign" refers to the a priori theoretical sign of the explanatory variable.

**Table 3.2: Sample distribution of firm-year observations across industries, years and countries**

| <b>Panel A: Sample distribution across sectors</b> |                     |  |  |
|--|---------------------|--|--|
| <b>Industry categories</b>                         | <b>Observations</b> |  |  |
| Basic materials                                    | 2,204               |  |  |
| Consumer goods                                     | 3,042               |  |  |
| Consumers services                                 | 3,210               |  |  |
| Financials   | 1,578               |  |  |
| Healthcare   | 1,504               |  |  |
| Industrials  | 4,527               |  |  |
| Oil & Gas  | 1,700               |  |  |
| Technology   | 2,208               |  |  |
| Telecommunications                                 | 550                 |  |  |
| Utilities  | 864                 |  |  |
| <b>Total</b>                                       | <b>21,207</b>       |  |  |

| <b>Panel B: Sample distribution across years</b> |                     |
|--|---------------------|
| <b>Year</b>                                      | <b>Observations</b> |
| 2002   | 645                 |
| 2003   | 658                 |
| 2004   | 1,223               |
| 2005   | 1,524               |
| 2006   | 1,525               |
| 2007   | 1,610               |
| 2008   | 1,920               |
| 2009   | 2,183               |
| 2010   | 2,577               |
| 2011   | 2,628               |
| 2012   | 2,507               |
| 2013   | 2,207               |
| <b>Total</b>                                     | <b>21,207</b>       |

| <b>Panel C: Sample distribution across countries</b> |                     |                    |                     |
|--|---------------------|--------------------|---------------------|
| <b>Country</b>                                       | <b>Observations</b> | <b>Country</b>     | <b>Observations</b> |
| Australia  | 465                 | Japan              | 3,259               |
| Austria  | 147                 | Malaysia           | 40                  |
| Belgium  | 148                 | Mexico             | 91                  |
| Brazil   | 209                 | Morocco            | 6                   |
| Canada   | 1,074               | Netherlands        | 255                 |
| Chile  | 34                  | New Zealand        | 11                  |
| China  | 310                 | Norway             | 155                 |
| Colombia   | 19                  | Philippines        | 35                  |
| Czech Republic                                       | 16                  | Poland             | 53                  |
| Denmark  | 149                 | Portugal           | 27                  |
| Dubai  | 3                   | Russian Federation | 59                  |
| Egypt  | 2                   | Saudi Arabia       | 11                  |
| Finland  | 145                 | Singapore          | 143                 |
| France   | 539                 | South Africa       | 190                 |
| Germany  | 685                 | South Korea        | 305                 |
| Greece   | 143                 | Spain              | 99                  |
| Hong Kong  | 679                 | Sweden             | 416                 |
| Hungary  | 8                   | Switzerland        | 469                 |
| India  | 22                  | Taiwan             | 380                 |
| Indonesia  | 88                  | Thailand           | 9                   |
| Ireland  | 78                  | Turkey             | 74                  |
| Israel   | 46                  | UK                 | 2,102               |
| Italy  | 315                 | US                 | 7,654               |
|  |                     | <b>Total</b>       | <b>21,207</b>       |

**Table 3.3: Descriptive Statistics: Low Cost Strategy**

|  | Observations | Mean     | Median  | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|--|--------------|----------|---------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>       | 9804         | 0.70     | 0.82    | 0.09    | 0.97    | 0.27               | -0.87    | 2.31     |
| <b>Env Gap Cost<sub>t-2</sub></b>      | 7369         | 0.77     | 0.15    | 0.00    | 3.76    | 1.20               | 1.59     | 4.06     |
| <b>Social Score<sub>t-2</sub></b>      | 5092         | 0.03     | 0.06    | -0.75   | 0.67    | 0.20               | -0.42    | 3.85     |
| <b>Age (in years)</b>                  | 9751         | 24.11    | 24      | 1       | 46      | 12.34              | -0.11    | 1.70     |
| <b>Employees</b>                       | 9804         | 37485.95 | 15259.5 | 15      | 267830  | 56069.12           | 2.60     | 9.89     |
| <b>Cash/Total Assets</b>               | 9802         | 0.13     | 0.09    | 0.00    | 0.65    | 0.12               | 1.75     | 6.58     |
| <b>Firm performance (ROA score )</b>   | 9799         | 0.09     | 0.07    | -0.20   | 0.39    | 0.07               | 0.86     | 5.54     |
| <b>Environmental Performance Index</b> | 8504         | 71.02    | 71.25   | 30.69   | 88.79   | 7.05               | -0.96    | 7.00     |
| <b>Openness</b>                        | 9681         | 0.51     | 0.34    | 0.25    | 1.23    | 0.28               | 1.10     | 3.30     |
| <b>Regulatory Quality</b>              | 9768         | 1.37     | 1.45    | -0.47   | 2.00    | 0.39               | -1.73    | 7.53     |
| <b>Rule of law</b>                     | 9768         | 1.44     | 1.58    | -0.95   | 2.00    | 0.45               | -2.61    | 10.67    |



**Table 3.4: Descriptive Statistics: Innovation Differentiation Strategy (R&D)**

|   | Observations | Mean     | Median | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|---|--------------|----------|--------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>          | 5614         | 0.77     | 0.89   | 0.09    | 0.97    | 0.23               | -1.41    | 3.80     |
| <b>Env Gap R&amp;D Diff<sub>t-2</sub></b> | 4427         | 0.55     | 0.10   | 0.00    | 2.28    | 0.82               | 1.38     | 3.27     |
| <b>Social Score<sub>t-2</sub></b>         | 3208         | 0.02     | 0.06   | -0.76   | 0.64    | 0.20               | -0.62    | 4.23     |
| <b>Age (in years)</b>                     | 5596         | 25.47    | 28     | 1       | 46      | 12.25              | -0.30    | 1.75     |
| <b>Employees</b>                          | 5614         | 17.46    | 17.01  | 9.73    | 23.93   | 2.62               | 0.41     | 2.35     |
| <b>Cash/Total Assets</b>                  | 5614         | 40247.19 | 18500  | 25      | 267830  | 55424.9            | 2.51     | 9.50     |
| <b>Firm performance (ROA score )</b>      | 5611         | 0.09     | 0.08   | -0.20   | 0.39    | 0.07               | 0.68     | 5.17     |
| <b>Environmental Performance Index</b>    | 4940         | 71.23    | 71.23  | 29.99   | 88.79   | 6.59               | -0.60    | 7.43     |
| <b>Openness</b>                           | 5573         | 0.49     | 0.30   | 0.25    | 1.23    | 0.29               | 1.16     | 3.19     |
| <b>Regulatory Quality</b>                 | 5604         | 1.35     | 1.39   | -0.47   | 2.00    | 0.34               | -1.59    | 8.42     |
| <b>Rule of law</b>                        | 5604         | 1.46     | 1.55   | -0.95   | 2.00    | 0.38               | -2.77    | 13.78    |



**Table 3.5: Descriptive Statistics: Marketing Differentiation Strategy**

|  | Observations | Mean     | Median  | Minimum | Maximum | Standard Deviation | Skewness | Kurtosis |
|--|--------------|----------|---------|---------|---------|--------------------|----------|----------|
| <b>Environmental Performance</b>       | 9892         | 0.70     | 0.82    | 0.09    | 0.97    | 0.27               | -0.93    | 2.47     |
| <b>Env Gap Cost<sub>t-2</sub></b>      | 7566         | 0.68     | 0.14    | 0.00    | 3.48    | 1.08               | 1.72     | 4.56     |
| <b>Social Score<sub>t-2</sub></b>      | 5295         | 0.02     | 0.06    | -0.74   | 0.67    | 0.21               | -0.44    | 3.88     |
| <b>Age (in years)</b>                  | 9833         | 24.13    | 24      | 1       | 46      | 12.45              | -0.11    | 1.69     |
| <b>Employees</b>                       | 9892         | 36935.28 | 15176.5 | 15      | 267830  | 55348.69           | 2.64     | 10.17    |
| <b>Cash/Total Assets</b>               | 9890         | 0.12     | 0.09    | 0.00    | 0.65    | 0.11               | 1.73     | 6.61     |
| <b>Firm performance (ROA score )</b>   | 9887         | 0.09     | 0.08    | -0.20   | 0.39    | 0.07               | 0.96     | 5.33     |
| <b>Environmental Performance Index</b> | 8612         | 71.02    | 71.23   | 29.99   | 88.79   | 7.00               | -0.94    | 6.99     |
| <b>Openness</b>                        | 9766         | 0.50     | 0.34    | 0.25    | 1.23    | 0.28               | 1.12     | 3.36     |
| <b>Regulatory Quality</b>              | 9856         | 1.38     | 1.45    | -0.53   | 2.00    | 0.39               | -1.76    | 7.75     |
| <b>Rule of law</b>                     | 9856         | 1.45     | 1.58    | -0.93   | 2.00    | 0.45               | -2.71    | 11.32    |

**Notes:** Min and max are the minimum and maximum values of the sample data, respectively. Skewness and kurtosis are the estimated centralized third and fourth moments of the data. See also table 3.1 for definitions of variables. All variables are winsorized at 1<sup>st</sup> and 99<sup>th</sup> percentiles.



**Table 3.6: Correlation matrix of variables: Low Cost Strategy**

|    |                                 | 1     | 2    | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|---------------------------------|-------|------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance       | 1     |      |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap Cost <sub>t-2</sub>     | 0,21  | 1    |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>     | 0,04  | 0,05 | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                       | 0,19  | 0,06 | -0,03 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                 | 0,29  | 0,07 | -0,14 | 0,26  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets Firm          | -0,02 | 0,01 | 0,00  | -0,07 | -0,06 | 1     |       |      |      |             |    |
| 7  | performance (ROA score )        | -0,02 | 0,01 | 0,20  | -0,06 | -0,20 | 0,20  | 1     |      |      |             |    |
| 8  | Environmental Performance Index | 0,07  | 0,04 | -0,03 | -0,07 | -0,17 | -0,04 | -0,10 | 1    |      |             |    |
| 9  | Openness                        | 0,04  | 0,03 | 0,06  | -0,22 | -0,28 | -0,08 | 0,00  | 0,64 | 1    |             |    |
| 10 | Regulatory Quality              | -0,07 | 0,01 | 0,11  | -0,05 | -0,55 | -0,06 | 0,16  | 0,45 | 0,39 | 1           |    |
| 11 | Rule of law                     | -0,04 | 0,02 | 0,04  | 0,01  | -0,38 | 0,00  | 0,11  | 0,41 | 0,27 | <b>0,86</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold.



**Table 3.7: Correlation matrix of variables: Innovation Differentiation Strategy (R&D)**

|    |                                 | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|---------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance       | 1     |       |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap R&D Diff <sub>t-2</sub> | 0,11  | 1     |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>     | 0,03  | 0,04  | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                       | 0,19  | 0,00  | -0,05 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                 | 0,29  | 0,07  | -0,19 | 0,28  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets               | -0,12 | 0,02  | -0,06 | -0,08 | -0,11 | 1     |       |      |      |             |    |
| 7  | Firm performance (ROA score )   | -0,11 | -0,06 | 0,17  | -0,06 | -0,29 | 0,17  | 1     |      |      |             |    |
| 8  | Environmental Performance Index | 0,07  | -0,02 | 0,00  | -0,04 | -0,12 | -0,09 | -0,06 | 1    |      |             |    |
| 9  | Openness                        | 0,03  | -0,05 | 0,08  | -0,25 | -0,26 | -0,13 | -0,01 | 0,63 | 1    |             |    |
| 10 | Regulatory Quality              | -0,10 | -0,06 | 0,19  | -0,09 | -0,61 | -0,01 | 0,23  | 0,46 | 0,44 | 1           |    |
| 11 | Rule of law                     | -0,05 | -0,03 | 0,14  | -0,02 | -0,50 | 0,02  | 0,18  | 0,47 | 0,32 | <b>0,88</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold.



**Table 3.8: Correlation matrix of variables: Marketing Differentiation Strategy**

|    |                                   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8    | 9    | 10          | 11 |
|----|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|-------------|----|
| 1  | Environmental Performance         | 1     |       |       |       |       |       |       |      |      |             |    |
| 2  | Env Gap Markt Diff <sub>t-2</sub> | 0,22  | 1     |       |       |       |       |       |      |      |             |    |
| 3  | Social Score <sub>t-2</sub>       | 0,05  | 0,06  | 1     |       |       |       |       |      |      |             |    |
| 4  | Log (Age)                         | 0,19  | 0,04  | -0,05 | 1     |       |       |       |      |      |             |    |
| 5  | Log (Employees)                   | 0,31  | 0,06  | -0,17 | 0,24  | 1     |       |       |      |      |             |    |
| 6  | Cash/Total Assets                 | -0,03 | 0,01  | -0,01 | -0,07 | -0,04 | 1     |       |      |      |             |    |
| 7  | Firm performance (ROA score )     | -0,08 | 0,02  | 0,20  | -0,07 | -0,23 | 0,20  | 1     |      |      |             |    |
| 8  | Environmental Performance Index   | 0,10  | 0,05  | 0,00  | -0,05 | -0,17 | -0,04 | -0,08 | 1    |      |             |    |
| 9  | Openness                          | 0,06  | 0,07  | 0,08  | -0,20 | -0,24 | -0,09 | -0,02 | 0,61 | 1    |             |    |
| 10 | Regulatory Quality                | -0,10 | -0,02 | 0,11  | -0,03 | -0,55 | -0,06 | 0,16  | 0,48 | 0,37 | 1           |    |
| 11 | Rule of law                       | -0,08 | -0,02 | 0,05  | 0,03  | -0,41 | -0,01 | 0,12  | 0,43 | 0,25 | <b>0,87</b> | 1  |

**Notes:** This table presents the pair-wise linear correlations among the variables included in eq. (1). Correlations over 0.6 are in bold.



**Table 3.9: Panel Regressions-Low Cost Strategy**

|                               | Environmental Score                                    |   |
|-------------------------------|--|---|
|                               | P1<br>High group<br>(>75% Cost of goods<br>sold/Sales) | P2<br>Middle group<br>(25-75% Cost of goods<br>sold/Sales ) |
| <b>Env Gap Cost</b> $t-2$     | 0.056***<br>(6.921)                                    | 0.026***<br>(6.106)   |
| <b>Social Score</b> $t-2$     | 0.027<br>(0.626)                                       | 0.022<br>(0.495)  |
| <b>Age</b>                    | 0.015<br>(0.847)                                       | 0.022*<br>(1.681)   |
| <b>Employees</b>              | 0.059***<br>(8.723)                                    | 0.054***<br>(5.544)   |
| <b>Cash/Total Assets</b>      | 0.067<br>(0.603)                                       | -0.034<br>(-0.712)  |
| <b>Firm performance</b>       | -0.121<br>(-0.664)                                     | 0.010<br>(0.101)  |
| <b>EPI</b>                    | -0.001<br>(-0.103)                                     | -0.017<br>(-1.417)  |
| <b>Openess</b>                | 0.067<br>(0.281)                                       | 0.131<br>(1.443)  |
| <b>Rule of law</b>            | 0.003<br>(.)   | 0.209<br>(0.919)  |
| <b>Constant</b>               | 0.249<br>(0.305)                                       | 1.180<br>(0.840)  |
| <b>Observations</b>           | 1215   | 1983  |
| <b>Adjusted R<sup>2</sup></b> | 0.4100   | 0.3051  |

**Notes:** Cost-Leaders: They charge low prices relative to their COGS, so the difference between SALES-GOGS is small and the price cost margin ratio ((Sales-COGS)/Sales) is small. (but they sell a large volume of units and thus they only aim on having a small profit from each unit sold - say cars made by KIA). Non-cost leaders (differentiators): They charge high prices relative to their COGS, so the difference between SALES-GOGS is large and the price cost margin ratio ((Sales-COGS)/Sales) is large. (but they only have a small volume of sales thus they need to earn a lot of money from each unit sold - say cars made by Mercedes-Benz).

**Table 3.10: Panel Regressions-Differentiation Strategy**

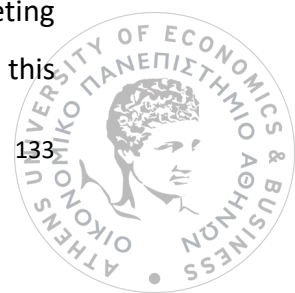
| <b>Environmental Score</b>                 |  |   |  |  |  |
|--|--|---|--|--|--|
|  | <b>R&amp;D Differentiation Leaders</b>                     |   |  | <b>Marketing Differentiation Leaders</b>                         |  |
|  | <b>P3</b>  | <b>P4</b>   |  | <b>P5</b>  | <b>P6</b>  |
|  | <b>High group<br/>(&gt;75% R&amp;D<br/>expenses/Sales)</b> | <b>Middle group<br/>(25-75% R&amp;D<br/>expenses/Sales)</b> |  | <b>High group<br/>(&gt;75%<br/>Marketing<br/>expenses/Sales)</b> | <b>Middle group<br/>(25-75% Marketing<br/>expenses /Sales)</b> |
| <b>Env Gap R&amp;D Diff<sub>t-2</sub></b>  | 0.044***<br>(4.639)  | 0.030***<br>(3.375)   | <b>Env Gap Markt Diff<sub>t-2</sub></b>    | 0.042***<br>(15.448)   | 0.039***<br>(7.969)  |
| <b>Social Score<sub>t-2</sub></b>          | -0.020<br>(-0.460)   | 0.040<br>(0.880)  | <b>Social Score<sub>t-2</sub></b>          | 0.043<br>(0.940)   | 0.039<br>(1.197)   |
| <b>Age</b>                                 | -0.007<br>(-0.438)   | 0.012<br>(0.980)  | <b>Age</b>                                 | 0.050***<br>(3.323)  | 0.021*<br>(1.796)  |
| <b>Employees</b>                           | 0.052***<br>(4.583)  | 0.043***<br>(6.454)   | <b>Employees</b>                           | 0.050***<br>(5.916)  | 0.053***<br>(5.942)  |
| <b>Cash/Total Assets</b>                   | -0.048<br>(-0.475)   | -0.113<br>(-1.502)  | <b>Cash/Total Assets</b>                   | 0.014<br>(0.161)   | -0.152**<br>(-2.103)   |
| <b>Firm performance<br/>(ROA score )</b>   | -0.108<br>(-0.837)   | 0.154<br>(1.037)  | <b>Firm performance<br/>(ROA score )</b>   | -0.286<br>(-1.634)   | -0.091<br>(-0.664)   |
| <b>Environmental<br/>Performance Index</b> | -0.039***<br>(-3.087)                                      | -0.032*<br>(-1.858)   | <b>Environmental<br/>Performance Index</b> | 0.010<br>(.)   | 0.009<br>(0.750)   |
| <b>Openess</b>                             | -0.222<br>(-1.183)   | 0.775***<br>(3.831)   | <b>Openess</b>                             | -0.083<br>(-0.316)   | 0.147<br>(0.758)   |
| <b>Rule of law</b>                         | -0.010<br>(.)  | 0.326***<br>(3.845)   | <b>Rule of law</b>                         | 0.219*<br>(1.725)  | 0.097<br>(0.586)   |
| <b>Constant</b>                            | 3.274***<br>(2.959)  | 2.056<br>(1.524)  | <b>Constant</b>                            | -1.065***<br>(-6.354)  | -0.691<br>(-0.516)   |
| <b>Observations</b>                        | 981  | 1080  | <b>Observations</b>                        | 1294   | 1703   |
| <b>Adjusted R<sup>2</sup></b>              | 0.3593   | 0.3384  | <b>Adjusted R<sup>2</sup></b>              | 0.3180   | 0.3602   |

## Conclusions

This thesis examines the determinants of corporate environmental responsibility in the framework of corporate strategy. More specifically, it deals with the determinants of two dimensions of corporate environmental strategy: corporate environmental disclosure and corporate environmental performance.

The first chapter investigates the effect of corporate social reputation, as depicted by the social performance that a firm has accumulated over time, on corporate environmental disclosure. Disclosure is of high importance according to the recent Directive of the European Parliament and Council obliging firms to disclose non-financial information (EU Directive, 2014), that demonstrates the urgent need for transparency of environmental practices. Results presented reveal that the level of social performance has a positive effect on the level of environmental disclosure. This positive relationship is explained by signaling theory in conjunction with the instrumental stakeholder theory. According to the instrumental stakeholder theory, socially inclined firms create formal and informal contractual relationships with stakeholders which establish their selected ethical character that varies across firms. Firms are likely to extend their relational contracts to environmental aspects, shaping a symmetric to the social level of environmental performance, disclosing in turn information regarding their environmental practices. This relationship demonstrates that the functions of the social and the environmental pillar of corporate sustainability are symmetric and interdependent, endogenously determined. The results of the first chapter confirm that the social pillar extends to the development of the environmental pillar, explaining the mechanism by which both interact, as the firm is marching on the road of corporate sustainability.

The second and third chapter examine imitative and proactiveness mechanisms based on the generic strategies framework, which determine the level of environmental performance that firms adopt. To investigate this, firms are classified according to their generic strategy. It uses three indicators to classify the strategy groups: the ratio of goods sold/ sales for firms that follow a low cost strategy and R&D expenses/ sales ratio and marketing expenses/ sales ratio for firms following innovative and marketing differentiation strategy respectively. More specifically, the second chapter of this



thesis shows that an imitation mechanism takes place under the general competitive strategy framework. According to this mechanism when a firm is outperformed in terms of environmental performance by the strategic leader in the same generic strategy group that the firm belongs, it tends to imitate the strategic leader. The greater the distance of the environmental practices of the firm from the strategic leader, the higher its environmental performance. Indeed, the results confirm that the imitation mechanism of environmental practices of strategic leader applies across both cost strategy and differentiation strategy groups. Being in line with the generic strategies framework and the institutional theory, the results suggest that environmental performance is directly centered not on the mimetic process of the environmental policy leaders themselves, but on the overall competitive strategy leaders.

However, in the case of innovative differentiation, as reflected by research and development practices, the results indicate that the mechanism under which firms imitate the strategic leader does not work. This result is not surprising. The research and development practices (R&D) have certain characteristics that prevent their imitation by competitors, such as the protection of intellectual property (e.g. patents), and the implementation in different stages that eliminate the possibility for competitors to decode them. This difficulty is expected to result as complex practices possibly involving technological patents raise legal barriers and procedural obstacles that give firms - pioneers the opportunity to preserve their competitive advantage. Therefore, the imitation process of R&D practices is possibly difficult to be performed effectively and may discourage competitors to try it, because of the uncertainty of the results. It is evident that the imitation of R&D practices is prevented by a combination of mechanisms that include the difficulty itself for R&D to be duplicated, the cost and the required resources of the imitating process, the continuous “chase” of the rapid change of technology and the uncertainty of the returns of R&D investment due to certain privileges that pioneers enjoy, such as the loyalty of interested groups because of an already established brand name.

Despite the insignificant results for R&D, overall, the results demonstrate that a firm is not looking for best environmental practices by monitoring the environmental

leader but the strategy leader with the best competitive strategy in its respective group, in order to cope with competition. Imitation of environmental practices can be effected either by adopting general environmental practices of the leader or by implementing practices concerning the competitive advantage inherent in the strategy they follow.

The third chapter examines the reaction of firms that ascertain, during the competitor monitoring, that they have a higher environmental performance level than their strategic leader. In this case imitation would mean convergence to the leader with negative impact on its environmental performance. However, results show that the opposite obtains. Being in line with the proactiveness perspective and the competitive advantage imperative, the results indicate that in this case the firm is activated to enhance its environmental performance. As it discovers the world of sustainability it is undertaking further environmental initiatives, investing in its potential competitive advantage. According to the results, this mechanism works across strategic groups, i.e. for firms that follow either cost strategy or differentiation strategy.

All three chapters consider national context factors such as the environmental performance index, the openness of the economy, the level of corruption and legislation enforcement. The findings show that these factors are relevant in explaining the observed levels of firm-level environmental disclosure and environmental performance in certain of the equations estimated.

The results have important managerial implications. Managers should monitor both strategic leaders and the environment, the legislation and other national indicators of the country in which they operate. This for the purpose of matching strategic leaders and also in order to realize in advance the conditions they are required to comply with in order to prepare on time their green agenda with consistency, and not to be forced to engage to constrained practices, for example greenwashing, that might result in loss of stakeholder trust. In any case, regardless of whether they are reactive or proactive, firms could only benefit from monitoring the strategic competitors and the national indicators. All are mediated by the formal and informal relational contracts that the firm has established with its stakeholders. For example, if a firm operates in

a country with strict laws regarding environmental issues, it should adopt them and communicate to its stakeholders its environmental practices to achieve its legitimacy. Respectively, for a firm operating in a country with low ability to impose its laws, corporate environmental disclosure could be used as a strategic weapon of competitive advantage, as the expected reaction of its competitors would likely be to rest due to the inactive state of the applicable laws and not to invest in environmental issues. So the managerial implications derived from these findings suggest that the managers should adjust and expand their practices by initiating monitoring and learning processes. For instance following their overall social reputation and the level of their environmental performance compared to the level of the environmental performance of their strategic leaders and the national environment in which they operate, they would activate imitative learning and environmental proactiveness.

To sum up, this dissertation clarifies some unanswered questions about the determinants of corporate environmental strategy. It draws upon the perspectives of instrumental stakeholder theory, imitative isomorphism in institutional theory, generic strategies and environmental proactiveness. Overall, it is extremely useful for business routines and functions to be explained not individually but like functions of living organisms that are not autonomous but act comparatively and with self-assessment as interrelated mechanisms. The three chapters of this PhD dissertation identify such mechanisms affecting corporate environmental strategy, both in environmental disclosure and environmental performance level.

## References

- Aerts, W., & Cormier, D. (2009). Media legitimacy and corporate environmental communication. *Accounting, Organizations and Society*, 34(1), 1–27.
- Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of Management Review*, 32(3), 836–863.
- Andrikopoulos, A., & Krikliani, N. (2013). Environmental Disclosure and Financial Characteristics of the Firm: The Case of Denmark. *Corporate Social Responsibility and Environmental Management*, 20(1), 55–64.
- Angrist, J. D., & Pischke, J.-S. (2009). *Mostly harmless econometrics: an empiricist's companion*. Princeton: Princeton University Press.
- Ansari, S. M., Fiss, P. C., & Zajac, E. J. (2010). Made to Fit: How Practices Vary As They Diffuse. *Academy of Management Review*, 35(1), 67–92.
- Aragón-Correa, J. A. (1998). Strategic Proactivity and Firm Approach to the Natural Environment. *Academy of Management Journal*, 41(5), 556–567.
- Aragón-Correa, J. A., & Sharma, S. (2003). A Contingent Resource-Based View of Proactive Corporate Environmental Strategy. *Academy of Management Review*, 28(1), 71–88.
- Argote, L. (1999). *Organizational learning: creating, retaining, and transferring knowledge*. Boston: Kluwer Academic.
- Artz, K. W., Norman, P. M., Hatfield, D. E., & Cardinal, L. B. (2010). A Longitudinal Study of the Impact of R&D, Patents, and Product Innovation on Firm Performance. *Journal of Product Innovation Management*, 27(5), 725–740.
- Ball, A., & Craig, R. (2010). Using neo-institutionalism to advance social and environmental accounting. *Critical Perspectives on Accounting*, 21(4), 283–293.

- Bansal, P., & Kistruck, G. (2006). Seeing Is (Not) Believing: Managing the Impressions of the Firm's Commitment to the Natural Environment. *Journal of Business Ethics*, 67(2), 165–180.
- Barnett, M. L., Jermier, J. M., & Lafferty, B. A. (2006). Corporate Reputation: The Definitional Landscape. *Corporate Reputation Review*, 9(1), 26–38.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120.
- Baron, D. P. (2001). Private Politics, Corporate Social Responsibility, and Integrated Strategy. *Journal of Economics & Management Strategy*, 10(1), 7–45.
- Baum, C., Schaffer, M., & Stillman, S. (2003). Instrumental variables and GMM: estimation and testing. *Working Paper, Boston College, Chestnut Hill, MA*.
- Belkaoui, A., & Karpik, P. G. (1989). Determinants of the Corporate Decision to Disclose Social Information. *Accounting, Auditing & Accountability Journal*, 2(1).
- Blombäck, A., & Brunninge, O. (2009). Corporate identity manifested through historical references. *Corporate Communications: An International Journal*, 14(4), 404–419.
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies*, 47(1), 239.
- Brief, A. P., & Motowidlo, S. J. (1986). Prosocial Organizational Behaviors. *Academy of Management Review*, 11(4), 710–725.
- Bromiley, P., & Rau, D. (2014). Towards a practice-based view of strategy. *Strategic Management Journal*, 35(8), 1249–1256.
- Brouthers, L. E., O'Donnell, E., & Hadjimarcou, J. (2005). Generic Product Strategies for Emerging Market Exports into Triad Nation Markets: A Mimetic Isomorphism Approach. *Journal of Management Studies*, 42(1), 225–245.

- Brown, D. L., Guidry, R. P., & Patten, D. M. (2009). Sustainability reporting and perceptions of corporate reputation: An analysis using fortune. *Advances in Environmental Accounting & Management*, 4, 83–104.
- Campbell, J. L. (2007). Why would corporations behave in socially responsible ways? an institutional theory of corporate social responsibility. *Academy of Management Review*, 32(3), 946–967.
- Campbell, J. L., Hollingsworth, J. R., & Lindberg, L. N. (Eds.). (1991). *Governance of the American economy*. Cambridge [England] ; New York: Cambridge University Press.
- Caves, R. E., & Porter, M. E. (1977). From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition\*. *The Quarterly Journal of Economics*, 91(2), 241–261.
- Ceccagnoli, M. (2009). Appropriability, preemption, and firm performance. *Strategic Management Journal*, 30(1), 81–98.
- Chandler, D., & Hwang, H. (2015). Learning From Learning Theory: A Model of Organizational Adoption Strategies at the Microfoundations of Institutional Theory. *Journal of Management*, 41(5), 1446–1476.
- Chen, S., & Bouvain, P. (2009). Is Corporate Responsibility Converging? A Comparison of Corporate Responsibility Reporting in the USA, UK, Australia, and Germany. *Journal of Business Ethics*, 87(1), 299–317.
- Cho, C. H., Guidry, R. P., Hageman, A. M., & Patten, D. M. (2012). Do actions speak louder than words? An empirical investigation of corporate environmental reputation. *Accounting, Organizations and Society*, 37(1), 14–25.
- Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, 32(7–8), 639–647.

- Cho, C. H., Roberts, R. W., & Patten, D. M. (2010). The language of US corporate environmental disclosure. *Accounting, Organizations and Society*, 35(4), 431–443.
- Christensen, L. T., Morsing, M., & Thyssen, O. (2013). CSR as aspirational talk. *Organization*, 20(3), 372–393.
- Christmann, P. (2000). Effects of “Best Practices” of Environmental Management on Cost Advantage: The Role of Complementary Assets. *Academy of Management Journal*, 43(4), 663–680.
- Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society*, 33(4–5), 303–327.
- Cooley, C. H. (1992). *Human Nature and the Social Order*. Transaction Publishers.
- Cormier, D., & Magnan, M. (2015). The Economic Relevance of Environmental Disclosure and its Impact on Corporate Legitimacy: An Empirical Investigation. *Business Strategy and the Environment*, 24(6), 431–450.
- Cragg, J. G., & Donald, S. G. (1993). Testing Identifiability and Specification in Instrumental Variable Models. *Econometric Theory*, 9(2), 222–240.
- Crane, A., & Glozer, S. (2016). Researching Corporate Social Responsibility Communication: Themes, Opportunities and Challenges. *Journal of Management Studies*, 53(7), 1223–1252.
- Cyert, R., & March, J. (1963). *A behavioral theory of the firm*. Englewood Cliffs: Prentice-Hall.
- Daft, R. L., & Weick, K. E. (1984). Toward a Model of Organizations as Interpretation Systems. *Academy of Management Review*, 9(2), 284–295.

- Deegan, C. (2007). Organizational legitimacy as a motive for sustainability reporting. In B. O'Dwyer, J. Bebbington, & J. Unerman (Eds.), *Sustainability Accounting and Accountability* (pp. 127–149). Routledge.
- Delmas, M. A., & Toffel, M. W. (2008). Organizational responses to environmental demands: opening the black box. *Strategic Management Journal*, 29(10), 1027–1055.
- Desai, V. M. (2014). Does disclosure matter? Integrating organizational learning and impression management theories to examine the impact of public disclosure following failures. *Strategic Organization*, 12(2), 85–108.
- Desai, V. M. (2016). Under the Radar: Regulatory Collaborations and their Selective Use to Facilitate Organizational Compliance. *Academy of Management Journal*, 59(2), 636–657.
- Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review*, 86(1), 59–100.
- Dick-Nielsen, J., Feldhütter, P., & Lando, D. (2012). Corporate bond liquidity before and after the onset of the subprime crisis. *Journal of Financial Economics*, 103(3), 471–492.
- Dierickx, I., & Cool, K. (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science*, 35(12), 1504–1511.
- DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147.
- Doh, J. P., & Guay, T. R. (2006). Corporate Social Responsibility, Public Policy, and NGO Activism in Europe and the United States: An Institutional-Stakeholder Perspective. *Journal of Management Studies*, 43(1), 47–73.

- Donaldson, T., & Preston, L. E. (1995). The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *Academy of Management Review*, 20(1), 65–91.
- Dranove, D., & Jin, G. Z. (2010). Quality Disclosure and Certification: Theory and Practice. *Journal of Economic Literature*, 48(4), 935–963.
- Drucker, P. F. (1993). *Management: tasks, responsibilities, practices*. New York, NY: HarperBusiness.
- Du, S., Bhattacharya, C. b., & Sen, S. (2010). Maximizing Business Returns to Corporate Social Responsibility (CSR): The Role of CSR Communication. *International Journal of Management Reviews*, 12(1), 8–19.
- Dunphy, D. C., Griffiths, A., & Benn, S. (2007). *Organizational change for corporate sustainability: a guide for leaders and change agents of the future* (2nd ed). London ; New York: Routledge.
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, 60(11), 2835–2857.
- Egri, C. P., & Herman, S. (2000). Leadership in the North American Environmental Sector: Values, Leadership Styles, and Contexts of Environmental Leaders and their Organizations. *Academy of Management Journal*, 43(4), 571–604.
- Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review. *Academy of Management Review*, 14(1), 57–74.
- El Ghouli, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, 35(9), 2388–2406.
- Escobar, L. F., & Vredenburg, H. (2011). Multinational Oil Companies and the Adoption of Sustainable Development: A Resource-Based and Institutional Theory

Interpretation of Adoption Heterogeneity. *Journal of Business Ethics*, 98(1), 39–65.

Etzion, D., & Ferraro, F. (2010). The Role of Analogy in the Institutionalization of Sustainability Reporting. *Organization Science*, 21(5), 1092–1107.

EU Directive. (2014). Directive 2014/95/EU of the European Parliament and of the Council amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups.

Fershtman, C., & Markovich, S. (2010). Patents, imitation and licensing in an asymmetric dynamic R&D race. *International Journal of Industrial Organization*, 28(2), 113–126.

Fifka, M. S. (2013). Corporate Responsibility Reporting and its Determinants in Comparative Perspective – a Review of the Empirical Literature and a Meta-analysis. *Business Strategy and the Environment*, 22(1), 1–35.

Fiol, C. M., & Lyles, M. A. (1985). Organizational Learning. *Academy of Management Review*, 10(4), 803–813.

Flammer, C. (2015). Does product market competition foster corporate social responsibility? Evidence from trade liberalization: Does Competition Foster CSR? *Strategic Management Journal*, 36(10), 1469–1485.

Fombrun, C. (1996). *Reputation: Realizing value from the corporate image*. Boston, MA: Harvard Business Press.

Fombrun, C., & Shanley, M. (1990). What's in a Name? Reputation Building and Corporate Strategy. *Academy of Management Journal*, 33(2), 233–258.

Fredriksson, P. G., & Svensson, J. (2003). Political instability, corruption and policy formation: the case of environmental policy. *Journal of Public Economics*, 87(7–8), 1383–1405.



Freeman, R. E. (1984). *Strategic management: A Stakeholder Approach*. RE Freeman–Boston: Pitman/Ballinger.

Freeman, R. E., Pierce, J., & Dodd, R. (2000). *Environmentalism and the new logic of business: how firms can be profitable and leave our children a living planet*. New York: Oxford University Press.

Friedman, M. (1970). The social responsibility of business is to increase its profits. *New York*, 122–124.

Goffman, E. (1959). *The presentation of self in everyday life* (Nachdr.). New York, NY: Doubleday.

Govindarajan, V., & Srinivas, S. (2013). The Innovation Mindset in Action: 3M Corporation. Retrieved from <https://hbr.org/2013/08/the-innovation-mindset-in-acti-3>

Grant, R. M. (1991). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, 33(3), 114–135.

Grant, R. M. (1996). Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration. *Organization Science*, 7(4), 375–387.

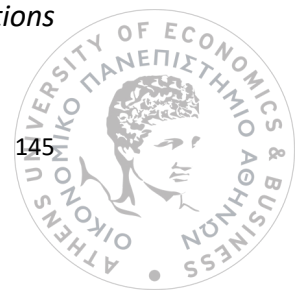
Guidry, R. P., & Patten, D. M. (2012). Voluntary disclosure theory and financial control variables: An assessment of recent environmental disclosure research. *Accounting Forum*, 36(2), 81–90.

Hall, P. A., & Soskice, D. W. (Eds.). (2001). *Varieties of capitalism: the institutional foundations of comparative advantage*. Oxford [England] ; New York: Oxford University Press.

Halme, M., & Huse, M. (1997). The influence of corporate governance, industry and country factors on environmental reporting. *Scandinavian Journal of Management*, 13(2), 137–157.



- Hambrick, D. C. (1983). High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach. *Academy of Management Journal*, 26(4), 687–707.
- Hansen, L. P. (1982). Large Sample Properties of Generalized Method of Moments Estimators. *Econometrica*, 50(4), 1029.
- Harrison, J. S., & Freeman, R. E. (1999). Stakeholders, Social Responsibility, and Performance: Empirical Evidence and Theoretical Perspectives. *Academy of Management Journal*, 42(5), 479–485.
- Hart, S. L. (1995). A Natural-Resource-Based View of the Firm. *Academy of Management Review*, 20(4), 986–1014.
- Hart, S. L., & Dowell, G. (2010). A Natural-Resource-Based View of the Firm: Fifteen Years After. *Journal of Management*, 0149206310390219.
- Hart, S. L., & Milstein, M. B. (2003). Creating sustainable value. *Academy of Management Executive*, 17(2), 56–67.
- Hartmann, J., & Uhlenbruck, K. (2015). National institutional antecedents to corporate environmental performance. *Journal of World Business*, 50(4), 729–741.
- Hauschild, P. R., & Miner, A. S. (1997). Modes of Interorganizational Imitation: The Effects of Outcome Salience and Uncertainty. *Administrative Science Quarterly*, 42(3), 472.
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251–1271.
- Haveman, H. A. (1993). Follow the Leader: Mimetic Isomorphism and Entry Into New Markets. *Administrative Science Quarterly*, 38(4), 593.
- Helpman, E. (1993). Innovation, Imitation, and Intellectual Property Rights. *Econometrica*, 61(6), 1247–1280.
- Hopwood, A. G. (2009). Accounting and the environment. *Accounting, Organizations and Society*, 34(3–4), 433–439.



- Huang, C.-L., & Kung, F.-H. (2010). Drivers of Environmental Disclosure and Stakeholder Expectation: Evidence from Taiwan. *Journal of Business Ethics*, 96(3), 435–451.
- Hull, C. E., & Rothenberg, S. (2008). Firm performance: the interactions of corporate social performance with innovation and industry differentiation. *Strategic Management Journal*, 29(7), 781–789.
- Ioannou, I., & Serafeim, G. (2011). The Consequences of Mandatory Corporate Sustainability Reporting. *SSRN Electronic Journal*. Retrieved from <http://www.ssrn.com/abstract=1799589>
- Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*, 43(9), 834–864.
- Jackson, G., & Apostolakou, A. (2010). Corporate Social Responsibility in Western Europe: An Institutional Mirror or Substitute? *Journal of Business Ethics*, 94(3), 371–394.
- Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*, 6(3), 255–259.
- Jayasinghe, M. (2016). The Operational and Signaling Benefits of Voluntary Labor Code Adoption: Reconceptualizing the Scope of Human Resource Management in Emerging Economies. *Academy of Management Journal*, 59(2), 658–677.
- Jones, T. M. (1995). Instrumental Stakeholder Theory: A Synthesis of Ethics and Economics. *Academy of Management Review*, 20(2), 404–437.
- Kapferer, J.-N. (2010). All that Glitters is not Green: The challenge of sustainable luxury. *The European Business Review*, pp. 40–45.
- Kapferer, J.-N., & Tabatoni, O. (2010). *Is the luxury industry really a financier's dream ?* (Les Cahiers de Recherche No. 935). HEC Paris. Retrieved from <http://econpapers.repec.org/paper/ebgheccah/0935.htm>

- Khurana, I. K., & Raman, K. K. (2004). Litigation Risk and the Financial Reporting Credibility of Big 4 versus Non-Big 4 Audits: Evidence from Anglo-American Countries. *The Accounting Review*, *79*(2), 473–495.
- King, A. A., Lenox, M. J., & Terlaak, A. (2005). The Strategic Use of Decentralized Institutions: Exploring Certification With the ISO 14001 Management Standard. *Academy of Management Journal*, *48*(6), 1091–1106.
- Kitzmueller, M., & Shimshack, J. (2012). Economic Perspectives on Corporate Social Responsibility. *Journal of Economic Literature*, *50*(1), 51–84.
- Kleibergen, F., & Paap, R. (2006). Generalized reduced rank tests using the singular value decomposition. *Journal of Econometrics*, *133*(1), 97–126.
- Kolk, A. (2003). Trends in sustainability reporting by the Fortune Global 250. *Business Strategy and the Environment*, *12*(5), 279–291.
- Lammers, J. C. (2011). How Institutions Communicate: Institutional Messages, Institutional Logics, and Organizational Communication. *Management Communication Quarterly*, *25*(1), 154–182.
- Lange, D., Lee, P. M., & Dai, Y. (2011). Organizational Reputation: A Review. *Journal of Management*, *37*(1), 153–184.
- Laufer, W. S. (2003). Social Accountability and Corporate Greenwashing. *Journal of Business Ethics*, *43*(3), 253–261.
- Lee, S. Y. (2016). How can companies succeed in forming CSR reputation? *Corporate Communications: An International Journal*, *21*(4), 435–449.
- Levy, D. L., Brown, H. S., & Jong, M. de. (2010). The Contested Politics of Corporate Governance The Case of the Global Reporting Initiative. *Business & Society*, *49*(1), 88–115.
- Lieberman, M. B., & Asaba, S. (2006). Why Do Firms Imitate Each Other? *Academy of Management Review*, *31*(2), 366–385.



- Lieberman, M. B., & Montgomery, D. B. (1988). First-mover advantages. *Strategic Management Journal*, 9(S1), 41–58.
- Lindenberg, S., & Steg, L. (2007). Normative, Gain and Hedonic Goal Frames Guiding Environmental Behavior. *Journal of Social Issues*, 63(1), 117–137.
- Maignan, I., & Ralston, D. A. (2002). Corporate Social Responsibility in Europe and the U.S.: Insights from Businesses' Self-presentations. *Journal of International Business Studies*, 33(3), 497–514.
- Mansfield, E., Schwartz, M., & Wagner, S. (1981). Imitation Costs and Patents: An Empirical Study. *The Economic Journal*, 91(364), 907–918.
- March, J. G. (2010). *The Ambiguities of Experience* (1st ed.). Cornell University Press.
- Margolis, J. D., & Walsh, J. P. (2003). Misery Loves Companies: Rethinking Social Initiatives by Business. *Administrative Science Quarterly*, 48(2), 268–305.
- Markman, G. D., Espina, M. I., & Phan, P. H. (2004). Patents as Surrogates for Inimitable and Non-Substitutable Resources. *Journal of Management*, 30(4), 529–544.
- Marquis, C., Glynn, M. A., & Davis, G. F. (2007). Community isomorphism and corporate social action. *Academy of Management Review*, 32(3), 925–945.
- McWilliams, A., & Siegel, D. S. (2011). Creating and Capturing Value: Strategic Corporate Social Responsibility, Resource-Based Theory, and Sustainable Competitive Advantage. *Journal of Management*, 37(5), 1480–1495.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, 83(2), 340–363.
- Mitnick, B. M. (2000). Commitment, Revelation, and the Testaments of Belief: The Metrics of Measurement of Corporate Social Performance. *Business & Society*, 39(4), 419–465.

- Morsing, M., & Schultz, M. (2006). Corporate social responsibility communication: stakeholder information, response and involvement strategies. *Business Ethics: A European Review*, 15(4), 323–338.
- Murillo-Luna, J. L., Garcés-Ayerbe, C., & Rivera-Torres, P. (2008). Why do patterns of environmental response differ? A stakeholders' pressure approach. *Strategic Management Journal*, 29(11), 1225–1240.
- Neu, D., Warsame, H., & Pedwell, K. (1998). Managing Public Impressions: Environmental Disclosures in Annual Reports. *Accounting, Organizations and Society*, 23(3), 265–282.
- Nijhof, & Jeurissen, R. J. M. (2010). The glass ceiling of corporate social responsibility: Consequences of a business case approach towards CSR. *International Journal of Sociology and Social Policy*, 30(11/12), 618–631.
- Oliver, C. (1991). Strategic Responses to Institutional Processes. *Academy of Management Review*, 16(1), 145–179.
- Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate Social and Financial Performance: A Meta-Analysis. *Organization Studies*, 24(3), 403–441.
- Ortas, E., Gallego-Alvarez, I., & Álvarez Etxeberria, I. (2015). Financial Factors Influencing the Quality of Corporate Social Responsibility and Environmental Management Disclosure: A Quantile Regression Approach. *Corporate Social Responsibility and Environmental Management*, 22(6), 362–380.
- Papagiannakis, G., & Lioukas, S. (2012). Values, attitudes and perceptions of managers as predictors of corporate environmental responsiveness. *Journal of Environmental Management*, 100, 41–51.
- Patten, D. M. (2002). The relation between environmental performance and environmental disclosure: a research note. *Accounting, Organizations and Society*, 27(8), 763–773.

- Pedersen, E. R. G., Neergaard, P., Pedersen, J. T., & Gwozdz, W. (2013). Conformance and Deviance: Company Responses to Institutional Pressures for Corporate Social Responsibility Reporting. *Business Strategy and the Environment*, 22(6), 357–373.
- Perez-Aleman, P. (2011). Collective Learning in Global Diffusion: Spreading Quality Standards in a Developing Country Cluster. *Organization Science*, 22(1), 173–189.
- Perrini, F., & Minoja, M. (2007). Strategizing corporate social responsibility: evidence from an Italian medium-sized, family-owned company. *Business Ethics: A European Review*, 17(1), 47–63.
- Petersen, M. A. (2009). Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *Review of Financial Studies*, 22(1), 435–480.
- Phillips, D. J., & Zuckerman, E. W. (2001). Middle-Status Conformity: Theoretical Restatement and Empirical Demonstration in Two Markets. *American Journal of Sociology*, 107(2), 379–429.
- Pisano, A. (2013). Quality disclosure. <http://www.bankpedia.org/index.php/en/122-english/q/23717-quality-disclosure>
- Pless, N. M., Maak, T., & Waldman, D. A. (2012). Different Approaches Toward Doing the Right Thing: Mapping the Responsibility Orientations of Leaders. *The Academy of Management Perspectives*, 26(4), 51–65.
- Porter, M. E. (1976). *Interbrand Choice, Strategy, and Bilateral Market Power*. Harvard University Press.
- Porter, M. E. (1980). Competitive strategy: Techniques for analyzing industries and competition. *New York*, 300.
- Porter, M. E., & Kramer, M. R. (2006, December 1). Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility.

- Porter, M. E., & Van der Linde, C. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *The Journal of Economic Perspectives*, 9(4), 97–118.
- Posen, H. E., Lee, J., & Yi, S. (2013). The power of imperfect imitation: The Power of Imperfect Imitation. *Strategic Management Journal*, 34(2), 149–164.
- Reed, K. (2002). Everyone Takes the Field: How 3M Encourages Employee Involvement in Promoting Sustainable Development. *Corporate Environmental Strategy*, 9(4), 383–389.
- Reid, E. M., & Toffel, M. W. (2009). Responding to public and private politics: corporate disclosure of climate change strategies. *Strategic Management Journal*, 30(11), 1157–1178.
- Ribando, J. M., & Bonne, G. (2010). A new quality factor: Finding alpha with ASSET4 ESG data. *Thomson Reuters*.
- Roberts, P. W., & Dowling, G. R. (2002). Corporate reputation and sustained superior financial performance. *Strategic Management Journal*, 23(12), 1077–1093.
- Robinson, M., Kleffner, A., & Bertels, S. (2011). Signaling Sustainability Leadership: Empirical Evidence of the Value of DJSI Membership. *Journal of Business Ethics*, 101(3), 493–505.
- Schultz, P.W., & Zelenzy, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology*, 19(3), 255–265.
- Scott, W. R. (1987). The Adolescence of Institutional Theory. *Administrative Science Quarterly*, 32(4), 493.
- Sharma, S., & Vredenburg, H. (1998). Proactive Corporate Environmental Strategy and the Development of Competitively Valuable Organizational Capabilities. *Strategic Management Journal*, 19(8), 729–753.

- Shrivastava, P. (1995). Environmental technologies and competitive advantage. *Strategic Management Journal*, 16(S1), 183–200.
- Spanos, Y. E., Zaralis, G., & Lioukas, S. (2004). Strategy and industry effects on profitability: evidence from Greece. *Strategic Management Journal*, 25(2), 139–165.
- Stock, J. H., & Yogo, M. (2005). Testing for Weak Instruments in Linear IV Regression. In *Identification and Inference for Econometric Models: Essays in Honor of Thomas J. Rothenberg*. Cambridge University Press.
- Surroca, J., Tribo, J. A., & Waddock, S. (2009). Corporate responsibility and financial performance: the role of intangible resources. *Strategic Management Journal*, 31(5), 463–490.
- Surroca, J., Tribó, J. A., & Waddock, S. (2010). Corporate responsibility and financial performance: the role of intangible resources. *Strategic Management Journal*, 31(5), 463–490.
- Thompson, S. B. (2011). Simple formulas for standard errors that cluster by both firm and time. *Journal of Financial Economics*, 99(1), 1–10.
- Thornhill, S., & White, R. E. (2007). Strategic purity: A multi-industry evaluation of pure vs. hybrid business strategies. *Strategic Management Journal*, 28(5), 553–561.
- Toms, J. S. (2002). Firm Resources, quality signals and the determinants of corporate environmental reputation: Some UK evidence. *The British Accounting Review*, 34(3), 257–282.
- Ullmann, A. A. (1985). Data in Search of a Theory: A Critical Examination of the Relationships Among Social Performance, Social Disclosure, and Economic Performance of U.S. Firms. *Academy of Management Review*, 10(3), 540–557.
- Van Aaken, D., Splitter, V., & Seidl, D. (2013). Why do corporate actors engage in pro-social behaviour? A Bourdieusian perspective on corporate social responsibility. *Organization*, 20(3), 349–371.

- Van de Ven, B. (2008). An Ethical Framework for the Marketing of Corporate Social Responsibility. *Journal of Business Ethics*, 82(2), 339–352.
- Van der Laan Smith, J., Adhikari, A., & Tondkar, R. H. (2005). Exploring differences in social disclosures internationally: A stakeholder perspective. *Journal of Accounting and Public Policy*, 24(2), 123–151.
- Van Riel, C. B. M., & Fombrun, C. J. (2007). *Essentials of Corporate Communication: Implementing Practices for Effective Reputation Management*. Routledge.
- Vermeulen, P. A. M., & Curseu, P. L. (2010). *Entrepreneurial Strategic Decision-making: A Cognitive Perspective*. Edward Elgar Publishing.
- Wagner, T., Lutz, R. J., & Weitz, B. A. (2009). Corporate Hypocrisy: Overcoming the Threat of Inconsistent Corporate Social Responsibility Perceptions. *Journal of Marketing*, 73(6), 77–91.
- Waldman, D. A., & Siegel, D. (2008). Defining the socially responsible leader. *The Leadership Quarterly*, 19(1), 117–131.
- Walker, K., & Wan, F. (2012). The Harm of Symbolic Actions and Green-Washing: Corporate Actions and Communications on Environmental Performance and Their Financial Implications. *Journal of Business Ethics*, 109(2), 227–242.
- Winter, S. G. (2006). The logic of appropriability: From Schumpeter to Arrow to Teece. *Research Policy*, 35(8), 1100–1106.
- Wooldridge, J. M. (2002). *Econometric Analysis Cross Section Panel*. MIT Press.
- Yoon, Y., Gürhan-Canli, Z., & Schwarz, N. (2006). The Effect of Corporate Social Responsibility (CSR) Activities on Companies With Bad Reputations. *Journal of Consumer Psychology*, 16(4), 377–390.
- Yoshimori, M. (2005). Does Corporate Governance Matter? Why the Corporate Performance of Toyota and Canon is Superior to GM and Xerox. *Corporate Governance: An International Review*, 13(3), 447–457.

Zadek, S. (2004). The Path to Corporate Responsibility. Retrieved from <https://hbr.org/2004/12/the-path-to-corporate-responsibility>

Zander, U., & Kogut, B. (1995). Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test. *Organization Science*, 6(1), 76–92.

Zyglidopoulos, S., & Fleming, P. (2011). Corporate accountability and the politics of visibility in “late modernity.” *Organization*, 18(5), 691–706.

