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Strategic human resource management, human resource effectiveness, and organizational performance: A longitudinal case study

Borucki, Chester Christopher, Ph.D.

The University of Michigan, 1989

STRATEGIC HUMAN RESOURCE MANAGEMENT, HUMAN RESOURCE
EFFECTIVENESS, AND ORGANIZATIONAL PERFORMANCE: A
LONGITUDINAL CASE STUDY

by

Chester Christopher Borucki

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Business Administration)
in The University of Michigan
1989

Doctoral Committee:

Professor Noel M. Tichy, Chairman
Associate Professor Kim S. Cameron
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Assistant Professor Stuart L. Hart
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To my late uncle Walter, who taught me to respect the
importance of family and the homestead
To my mother, Viola, who provided me with strong values, a
big heart, and the will to persist in chasing my dreams
And to my brother Bob, who taught me the promises
and perils of pursuing an education

ACKNOWLEDGEMENTS

Michigan wasn't what I expected when I got there. First, the environment. The weather was and generally is lousy. It rains frequently and unexpectedly in the spring and summer, and a dull, overcast sky masks the sun through much of autumn and winter. The terrain in the southern half of the state, too, is pretty flat, offering little challenge to the avid skier.

Second was the program I joined. Actually, the School of Business Administration didn't really have much of a program in Organizational Behavior in 1981. Andy McGill and I formed a cohort of two--with a gap of two years before and after us in which there were no other students. As a consequence, little faculty attention was devoted to the doctoral program in those early years.

But my expectations eventually were not only met, they were exceeded in many ways. It took time, people, and resources. Michigan was good to me, and Michigan was good for me. What makes Ann Arbor outstanding are the people there. I met some damned fine individuals from various walks of life who taught me more than a valuable lesson or two about myself, and the profession I was engaging in.

Finishing a project like this after years in the making causes one to pause and pay tribute to those who helped

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along the way. My friends, family and colleagues have shared in the pain and the joy of the task, many from beginning to end. Again, space and deadlines do not allow me the luxury of properly acknowledging all of those who played essential roles as motivators, therapists, support group members and playmates throughout the process. Recognizing this flaw in my character, here goes . . .

First and foremost on the "list" is my family--my parents Vi and Ed, and my brothers Ed Jr., Bob, Steve, Walt, Paul and Peter. Marcia, Neil, Kim, Aaron, and Sue round out the members of the clan. I love them all dearly and could not have taken on this task without their support and encouragement. The connection has always been strong with them. We've all heeded "Big Ed's" war cry--Remember Pearl Harbor!--when fairness has given way to foul play or when obstacles have seemed insurmountable. I know I can still count on their help for the many personal and professional battles that remain to be fought.

Elliot Carlisle played an influential role as advisor and mentor during an earlier phase of my academic training. I met Elliot when I was enrolled in the MBA program at the University of Massachusetts. At the time I had a full time job and was carrying a full course load, loving both and hesitant to give either up. Elliot and Joe Litterer opened my eyes to the paradoxical wonders and pitfalls of survey research and triggered my interest in studying organizational change. Elliot in particular pointed the way

toward Mecca, which in this case was in the midwest rather than the Far East. More than anyone else, he's responsible for my winding up in the Ph.d. program at Michigan.

My first year at Michigan was extremely difficult for a variety of reasons, and were it not for support derived from the relationships I developed, I more than probably would have left. Within the B-School, my seniors in the Ph.d. program were Bob Schwartz, Dave Meyer, Paul Farrah, and Ruth Montgomery, all of whom contributed to teaching me the ropes and getting me acclimated to the academic world. Ruth, in particular, went out of her way to welcome me and lent a sympathetic ear when the going seemed especially tough. She still does.

At ISR, I was fortunate to meet Stan Harris, Nancy Nolan (also now Harris), Reggie Bruce, Monica Wolford, Dee Perkins, Roger Schwarz, Jim Carillon, Richard Saavedra, Debbie Tracey, Stew Friedman, Bob Sutton, Doug Cowherd, Michelle Kaminski, and Corty Cammann. Many of these people were my cohorts in classes, colleagues in research projects, and collaborators in other escapades of a more hedonistic bent.

I particularly recall with great fondness mad scrambles with Bob across town for dinner, followed by cappuccino at the Blind Pig, then back to work at ISR in less than a half-hour. An occasional game of chess marked the end of a long work day. He's amazing. Stan, too, provided great social support for ameliorating stress through racquet ball, golf,

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skiing, and profound discussions about the vicissitudes of life. We had great times on the several projects we worked on together--I'm looking forward to more of the same in the future. I can't wait to join him at the alligator-wrestling tournament in Alabama!

I was also fortunate to work and exchange ideas with a number of scholars and practitioners from various areas during my time at Michigan. I benefited from collaborations with Alan Lafley at Chase-Manhattan Bank, Tom Murrin and Glenn Childs at Westinghouse, and Ed Dunn at Whirlpool, all of whom helped shaped my thinking about strategic change management and the role of human resources in the process. Dave Lundgren and Gary Kissler at GE's Lighting Business were also instrumental in reinforcing my interest in various aspects of organizational change as were Roxanne Decyk, Tom Kent, and Tom Ernst at Navistar-International. Ron Bendersky at Michigan's Division of Management Education and Dick Kennedy at General Electric Company's Management Development Institute deserve a special note of thanks for providing me with opportunities to research these ideas.

One of the many benefits of my work with GE beyond meeting Marie Andrews, of course, was meeting Warner Burke. When I think of the direction that Organization Development is heading toward, I think of Warner which provides me with a sense of relief.

Ed Miller, Mary Anne Devanna, and Charles Fombrun, too, deserve recognition. All three provided valuable feedback

in my earlier writings on strategic staffing practices and productivity improvement. Ed, too, provided guidance and developmental experiences on an action research project with Whirlpool. He's great to work with out in the field.

There are many others whom I must thank for a variety of reasons. In Michigan, these include Dave Snyder, Shaw-Kuan Chen, and Kiyohiko Ito, my office mates at various points in time who shared in my trials and tribulations. Many thanks also to Karen Oberg, Dave Urban, Jill Kruse Sandine, Joseph Yu, Sung-Il Cho, Shiing-Wu Wang, Javier and Diane Lerch, Bill Sasso, Rajan Kamath, Jay Sankaran, Cindy Campbell, Chris Westland, Sarah Freeman, Heung-Gook Kim, Diane and Dave Denis, and of course, Bob Comment, who has high entertainment value. Lee Danielson, Ray Hill, and Joanne Ripple, too, lent a sympathetic ear when the going was especially tough. Dorothy Contrucci, Debbie Lenz, Nick Hadwick, and Anne Preston also deserve a special nod. They fought the bureaucracy to get me the equipment and resources I needed while in Michigan at various points in time to work on this thesis. And Mark Tobias' knowledge of vertebral subluxations and how to correct them literally helped ease the load on my back when I was churning away in Ann Arbor.

Back home, Mary Anne Choquette, Heinz Scheidle, Mary Karukin, and Randy Knox were co-workers for years with whom I shared my dreams and aspirations. Peter Champoux, Dan Skoczylas, Kevin Sullivan and John, Andrew, Peter, and Phyllis Boothroyd, and Jon and Nancy Knudson all deserve

more than a note of thanks, too. I wished our paths crossed more often. I'm looking forward to carving some turns as part of my post-doctoral adventures, Randy--just like the old days. Keep those skis tuned!

Elsewhere, Duane and Debbie Wittkamper and family, and Fred Cheyunski are a special group of people who have supported my personal and career endeavors. So, too, are Kathy Wunderlich, Andy and Katy McGill--I really have a warm spot in my heart for these people. They have become special friends and I look forward to honoring the promises I've made to spend more quality time with them in the future.

It's time to face the inevitable and acknowledge the contributions of my dissertation committee. I was fortunate to be able to assemble a respected group of scholars who believed in me, gave me ample opportunity to explore fruitful ideas, and yet nudged me back to reality when it looked like the elixir of knowledge was overpowering me. They effectively steered me away from hazards that would have made this task even more arduous than it was. Noel Tichy was and continues to be a provocative stimulus in my life. He has never ceased to amaze me with his boundless energy, creative ideas, and attitude that mountains are meant to be climbed. Beyond all of Noel's notoriously bad habits and illustrious competencies, for me, his singular claim to fame is his incomparable loyalty to his team mates and staff. Without his support and encouragement, this thesis would never have been started, maintained, and

certainly not brought to a satisfactory conclusion. The product would not have been the same. I've grown under his tutelage. I only wish we could have tilted more windmills together. Maybe in the future . . .

Through the grace of God (and with the help of friends), I was fortunate to be able to convince Bob Kahn to sign up for duty as a committee member. When I think of a role model--a true scholar adept in a multitude of areas with unshakable values as a colleague and humanitarian, I think of Bob Kahn. Bob, I know you dislike having praise lavished on you, but I can't let you escape without expressing my sincere gratitude for enriching my life. I am grateful for having had the opportunity to work with you and hope that we can continue our dialogue. Thank you.

Kim Cameron also played a special role as a committee member. He is a fine scholar well grounded in theory who upholds high standards for research. This dissertation is a better product as a result of his involvement. In the four years that I have known him, I have yet to see Kim display anything but optimism in research and project-related work. He came through again as obstacles surfaced in my dissertation research. He is an exceptional individual who has also enriched my life.

Late in the game I asked Stuart Hart and Dan Denison to join my committee. This "Dynamic Duo" brought a lot of methodological firepower to the party and helped me address some complex issues in that domain. I'm fortunate that both

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were willing to give freely of their time to strengthen this thesis. As with the other committee members, both Stu and Dan offered great ideas, many of which I heeded, others of which I didn't. They also taught me the valuable lesson about the importance of TIMING of feedback. Next time we return to the scene of the crime at Dominick's, boys, may we be more conversant than we were the evening prior to my defense. The pitcher of beer is on me.

I have been in New York for two years now, and have been fortunate to have developed strong ties with colleagues and friends here. Many of these people have willingly and graciously accepted the added burden of support group members as I travelled the final mile. Keith and Marlene Weigelt, Mike and Pat Burke, Theresa Lant, Steve Mezias, Frances Milliken, Ruth Raubitchek, Janet Dukerich, Ruth Beltran and Arthur Weiner have become especially good friends during my brief time here. Others to whom I owe a debt of gratitude for various reasons include Randy Schuler and Charles Fombrun, who were instrumental in getting me to New York in the first place, Jane Dutton, Oscar Ornati, Dave Rogers, Dale Zand, Tom Gladwin, Art Brief, Praveen Nayyar, Surresh Kotha, Karen Epstein, Hrach Bedrosian, and John Dutton, who helped cut me the slack I needed to wrap this thesis up. Their support and collegiality are very much appreciated and I truly look forward to working with this fine group of scholars on future research endeavors.

Chris Moore, Alicia Serino, Doneley Meris, Melanie Farr and Yvonne Felix have provided much appreciated staff support in many ways that have contributed to the final production of this thesis. My sincere thanks.

My true champion in New York, though, has been Bill Guth. He also subscribes to the school of modesty as he generally disdains lavish praise. Were it not for Bill, I would not have come nor have stayed in New York. His belief in me through thick and thin has never wavered, and his optimism is unboundable. He makes things happen, and has no problem stirring up controversy when the situation calls for it. In short, he's a fine human being. My hat's off to you, chief. It's time we crack that bottle of Johnny Walker Black!

It would be a grave mistake to overlook those within the fictitious Electronics Components Group in Sterling for their contributions to this thesis. The location of this acknowledgement near the end of this section by no means diminishes their importance--I have been mulling over how to properly say thank you to these people whom I can't identify for reasons of confidentiality. Due to passage of time, promotions and job changes, I feel comfortable in identifying four individuals by first name who made this dissertation possible. John, Ken, and Joe, my thanks to you for the many fine discussions we had and your willingness to open your doors to me and helping to orchestrate the ECG follow-up study. You and the members of the HR Council are

truly the unsung heroes of human resources whose experiences I hardly captured throughout the course of this thesis. The fact that there is a strong connection between human resources and organizational performance is a strong testimony to your collective contributions, yet you have all been gracious in passing along the praise you have righteously earned while accepting criticisms you often don't deserve. I have enjoyed my interactions with all of you and hope that we can work together again soon.

And Walt, the research questions I set out to address would not have been possible without your support and willingness to run interference for me. You provided me with a perspective on the workings of ECG that is invaluable, and allowing me access to your staff and archives to sift out the data I needed was equally so. Thank you. Thanks are due, too, to the many line and HR managers who shared their experiences, perceptions, and aspirations with me during the course of the action research study who also contributed to my understanding of strategic change and human resource management.

Finally, I come to a group of three people to whom I am most appreciative. When I fell, they picked me up, when I was depressed, they cheered me, and when things appeared the foggiest or darkest, they illuminated the way.

There is a saying in Latin, which appropriately captures some of my sentiments: **Omnium Gallorum fortissimi sunt Belgae!** Roughly translated, it means, "Among the

Gauls, the Belgians are the most fiercest or courageous."
Without a doubt, this applies to Anne Impens and Philippe
Byosiere. They provided me with incredible support
throughout this whole process, running analyses, errands,
and interference for me in Michigan on short notice while I
was working here in New York. And they made sure that the
process wasn't all work and no play. My former colleagues
at Mt. Tom would be glad to hear that I did eventually carve
many a turn at ski areas in lower and upper Michigan in the
company of the "Belgian Blaster" (the nickname Phil has
righteously earned), along with Ann Impens, Stan and Nancy
Harris, and Carole Barnett. I think a little "Belgian" has
rubbed off on me as a result of this process--Phil and I
sure do argue a lot these days! They say it's good
training, though, for the Gentsefieste. Should we have
another "Last Supper" at Forbidden City, Phil, it's YOUR
turn to pick up the tab!

Perhaps most importantly, my deepest appreciation goes
to Carole Barnett. Working with her on the Human Resource
Management Journal has been an extremely rewarding
experience. Her knowledge, skills, abilities and
connections made her a natural as the leader of my support
group. The fact that this dissertation is now complete is a
testimony to Carole's often good-natured persistence. She
was involved at the earliest stages of my dissertation
research when I sought to gain re-entry into Sterling, and

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was a tremendous asset during every phase of the the action research project and the writing of this dissertation.

Carole has been a true friend, confidante, and bureaucracy buster par excellance. She can work wonders, as those who know her would attest. She has been my main link to Michigan and the human and other resources there. When I needed to reach Noel Tichy, she willingly and successfully intervened--a noteworthy accomplishment in and of itself! I have called on her at all hours of the day for support and to toss around ideas and she has been there. In addition, she made the time to read portions of earlier versions of this thesis, often at great personal expense. She has a fine eye for detail--her comments were extremely useful and helped shape my approach to tackling tough issues that surfaced. In short, she has been an invaluable source of knowledge, inspiration, encouragement and serenity--much like the golden palace of the Himilayas to which the deeply religious journey. You have my deepest gratitude--this accomplishment is as much yours as it is mine, and may the lessons learned from this experience serve you well as you pursue your own scholarly endeavors.

At (very) long last, despite the valuable input of many of the individuals mentioned above, let it be known that I begrudgingly let them off the hook. I alone bear responsibility for the product that follows.

January 29, 1989
New York, New York

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CHAPTER ONE

HARNESSING HUMAN RESOURCES POTENTIAL

We face insurmountable opportunities

Pogo (Walt Kelly)

Introduction

A message frequently found in corporate mission statements, annual reports and even on plaques adorning the walls of senior managers of organizations these days is that people are the firm's most valuable resource. It is an espoused value that many scholars, practitioners and managers claim is essential for driving organizational performance and attaining competitive advantage (Peters and Waterman, 1982; Deal and Kennedy, 1982; Kanter, 1983).

Compelling support for the efficacy of this orientation is found in the testimonials of widely respected CEOs such as James Burke of Johnson & Johnson, and Donald Lennox, recently retired from Navistar-International. Burke attributes J&J's ability to rebound from the Tylenol product tampering crisis to the company's people and culture.[1] Lennox also cites the importance of human resources in

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[1] Johnson & Johnson Company Philosophy and Culture, James E. Burke, Chairman and CEO. HBS Case Services, Harvard Business School, Videocassette No. 884-526.

1

successfully transforming the dying International Harvester Corporation into a refocused truck and engine manufacturing business that is now lean and healthy.[2]

Beyond day-to-day, or operational concerns for the effective management of an organization's "soft" assets to drive performance, there are increasing concerns about the longer-range, or strategic management of human resources--and with good reason. Naisbett and Auberdene (1985), among others, have argued that future competitive advantage will be linked to an organization's ability to attract and retain the best people to support strategic initiatives.

Though pundits laud the effect of human resources management on organizational performance, some critics argue that "our people are our most valuable resource" carries a message with little meaning or direct impact on the "bottom line." They question why, for example, a strong human resources emphasis didn't save People Express from demise after it experienced explosive growth in the airline industry. Perhaps the relationship is in the opposite direction. Are the luxury of sustained profitability and abundant slack resources, as in IBM's case, causal antecedents to human resources performance in the organization? After all, they provide for a no-layoff policy and the opportunity to continuously engage twenty percent of the workforce in retraining and development.

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2 Borucki, C., and Barnett, C.K. Restructuring for Self-Renewal: Navistar-International Corporation (Under review).

There is also empirical research that tends to support the position that good people practices don't necessarily drive or even equate with organizational performance. For example, Mitchell (1985) found that only 21 of the 100 best companies to work for in America ranked by Levering, Moskowitz, and Katz (1984) cross-listed with the 62 companies cited by Peters and Waterman (1982) as "excellent." From another perspective, sixty-six percent of the "excellent" companies identified by Peters and Waterman were not ranked among the best companies to work for in America. Thus, detractors offer the counterarguments that organizational performance drives rather than is influenced by effective human resource management, and that other situational or contextual variables may more strongly effect performance.

The debate regarding the direction of the human resources-organizational performance relationship and the dearth of longitudinal studies that allow for the empirical examination of this interaction provide the impetus for this dissertation research. An academic treatment of these issues and their relevance to scholars and practitioners will be provided in Chapter Two.

In this introductory chapter, I will briefly review the longitudinal strategic human resource management change project, research framework, and the specific research questions that serve as the foundation for this thesis. A conceptual model outlining the HRM and organizational

performance constructs that will be empirically examined in this thesis is presented, and a number of hypotheses regarding relationships between these variables are generated. The chapter concludes with an outline of the seven remaining chapters that comprise this dissertation.

Action Research in Sterling Industries Inc.

This thesis has an auspicious beginning. It is based on an action research project I became involved in during my first year in Michigan's OBHRM doctoral program. The project was designed to enhance the strategic capability and contributions of one organization's human resource function to drive and support business objectives. The organization in question is the largest business group of a Fortune 100 company. As an indication of size, the combined assets alone of this business group, which is comprised of eleven business units, would qualify it for membership on the Fortune 500 roster.

Genesis. In September of 1981, Noel Tichy, then Associate Professor of Organizational Behavior and Industrial Relations at The University of Michigan's School of Business Administration and Faculty Associate at its Institute for Social Research was invited to present his ideas on the dynamics of organizational change and strategic human resource management at a staff workshop conducted by the Vice-Chairman of Sterling Industries Inc. The theme of the workshop was human resource management, an issue of great interest to the Vice-Chairman who was considered by

many on his staff to be an "enlightened" leader. One of his
direct reports was Jon Knudson,[3] the Executive Vice-
President and leader of Sterling's largest business, the
Electronics Components Group. Knudson was sufficiently
impressed with Tichy's presentation to subsequently engage
him in discussion and consultations regarding strategic
human resource management.

Contextual Factors. At the time, ECG was the largest of
the corporation's five Groups with revenues of approximately
$1 billion and 20,000 employees. Figure 1.1 presents an
organizational chart for ECG as it was designed in 1981. An
in-house report to employees describes the Group as follows:

> ECG's strength lies in an organization of
> divisions, operations, and centers built along
> broad disciplinary lines. Experience within the
> group encompasses space and light systems,
> ordnance systems for land, sea, and air
> applications; electro-optical technologies and
> products; naval acoustics and commercial marine
> technologies and support; electronics production;
> training and weapon control equipment; and
> tactical support.[4]

Knudson had become convinced that a more participative
work environment was crucial to the ultimate success and
effectiveness of ECG's business. Like Sterling's Vice-
Chairman, Knudson advocated engaging employees in solving
critical problems and decision-making.

As a result of these consultations, Knudson invited

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3 The identity of the organization, its various divisions
  and business units, executives and managers mentioned in
  this thesis have been disguised to honor my commitment of
  confidentiality to the company.
4 ECG Annual Report to Employees, 1981, Sterling Industries
  Inc.

Figure 1.1 1981 ECG Organizational Chart[5,6]

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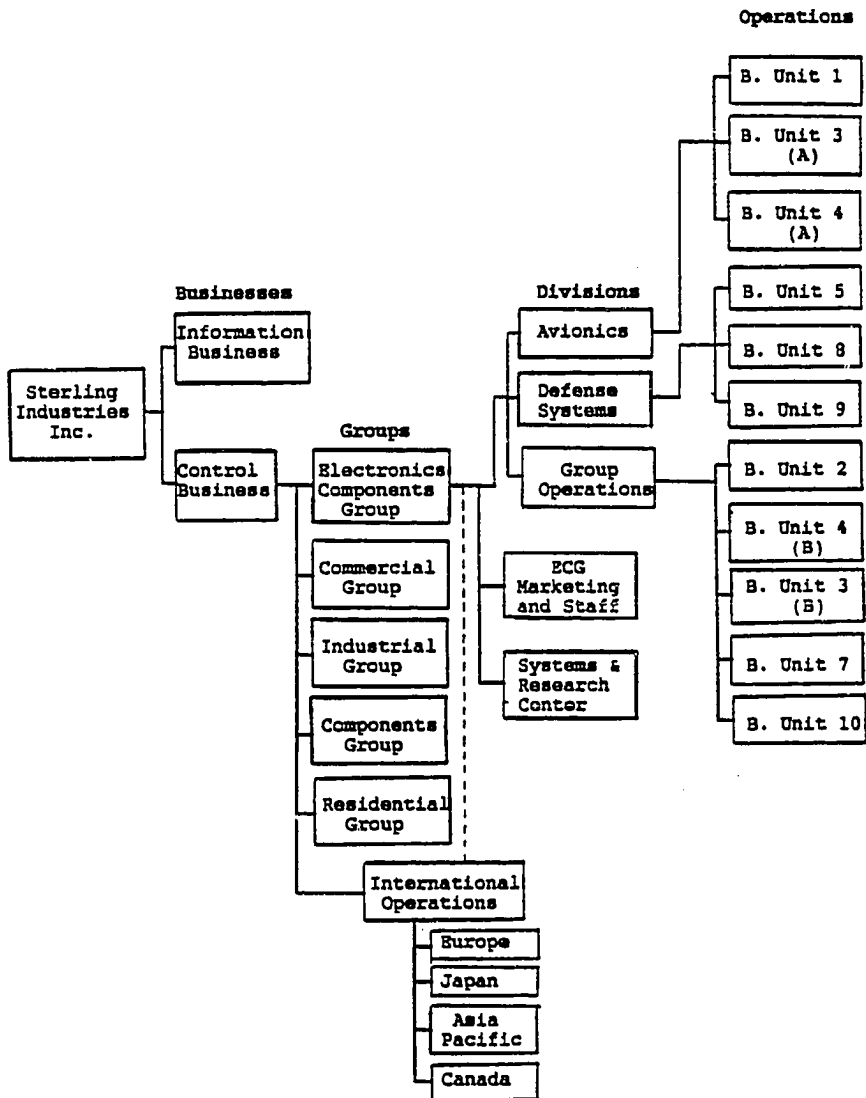
5 For analytical purposes, the numerical ordering of the Operations (Business Units) illustrated in the chart is based on the organization that emerged following the 1983 restructuring. The (A) and (B) designations represent operations that were combined to form divisions in the new configuration.

6 Derived from the ECG Annual Report to Employees, 1981, Sterling Industries Inc.

Tichy back to present to his direct reports and top managers at a two-day Quality of Work Life Conference. The primary objective of the conference was to "provide a greater awareness of people and their needs in managing a business."[7]

During the workshop, executives from each of the Divisions and Operations within ECG were called upon to summarize their accomplishments in improving human resource management within their organizations and to share their plans for continued improvement in HRM. Clearly, many human resource management initiatives had been or were in the process of being undertaken. Examples of accomplishments included development and implementation of gainsharing and flex-compensation programs, development of worker participation teams, culture-shaping and reinforcing measures undertaken to reduce turnover and increase productivity, and on-the-job career counseling initiatives.

Though definite progress was being made in improving ECG's human resource management systems, the workshop illuminated a problem of major concern to Knudson. Little was being done to coordinate, consolidate, and integrate the many initiatives underway into the strategic business planning process. Knudson sought Tichy's help with this challenge of harnessing ECG's human resources potential to achieve its long-term objectives.

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[7] Jon Knudson, opening address to ECG's Quality of Worklife Conference, November 10, 1981.

The consultations reified that ECG was undergoing rapid growth projected to continue at least for the duration of the Reagan Administration. Furthermore, the organization was experiencing problems in several areas and performing below its potential. A large percentage of the Group's business was contract work for the government. In fact, Sterling's 1981 Annual Report noted that "government spending in the United States and abroad is the greatest influence on growth in aerospace and defense markets. The defense budget passed by the current administration will benefit Sterling's business, with the major impact occurring in 1983 and beyond."[8] Defense-related sales accounted for about 80% of ECG's business, with the balance coming from space, commercial avionics and commercial marine markets. The following excerpts from an interview with Knudson in 1983 highlight the strengths, weaknesses, opportunities and threats confronting ECG:

> We embarked on a growth program about five years ago [1978] as we perceived that we had more technical capabilities, and there were more market opportunities available to us than we were addressing. We adopted a goal of growing the products and services to a larger market, and put additional money into the business. We were successful. The market responded well . . . we grew from about a $500 million business to a $1.5 billion business over a period of three to four years. Along the way, we had some successes; we also made some mistakes. We had some performance problems. We bit off more than we could chew. We were not doing our work as well as we believed we should in

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8 ECG Annual Report to Employees, 1981, Sterling Industries Inc.
9 Interview with Jon Knudson, 1983.

all of our programs. We set about to ask why
we were doing well in some places and not so
well in other places, and we came up with a
variety of answers.[9]

Knudson went on to briefly describe the problems that ECG encountered during this period while in a rapid stage of growth as well as what he perceived to be the causes of the problems:

We had problems with missing schedules on
major programs. We had problems which were
critical to not understanding technology on
programs well enough before we began working
on them. The causes almost always spelled
out that we had not understood or prepared
for the program well enough. In some cases
we had also not executed the program well
enough, having received it or having kicked
it off. Those kinds of problems implied
lapses in leadership and planning or in the
assignment of people to programs. Also, as
we looked more deeply into it, we found a
lack of involvement of all the people in the
process of planning the program
implementation. The result is a lack of
involvement by all the people who are working
on the program. So the improvement activity
turned out to be, in all cases, human
resource related.[10]

Beyond ECG's rapid growth-induced human resources problems, the organization was not buffered from the instability of environmental dynamics. An economic recession in the early 1980s was a distinct possibility and could adversely affect ECG's businesses. To decrease dependence on individual suppliers and also get "more bang for its bucks," the government was considering dual sourcing. As a consequence, there was a high probability that more companies would enter the market and compete for

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10 Interview with Jon Knudson, 1983.

lucrative contracts as well as a limited supply of capable engineers and other human resources talent (e.g., program managers). Uncertainty was further exacerbated by rapid technological advances and complexity. To support ECG's strategic change efforts and further develop its distinctive competencies and capability to adapt to the changing environment, two objectives were of primary concern to Knudson: (1) achieving and maintaining competitive advantage through productivity and quality improvement initiatives and (2) developing the strength and competence of ECG's Human Resource function in driving and supporting growth.

Wave 1. The initial outcome of the Knudson-Tichy consultations was an agreement for joint participation in an action research program. Three initial goals were considered: the design and development of (1) an ECG productivity and strategy system, (2) the human resource management systems needed to support the strategy, and (3) an information system to guide implementation and monitor success.

The scope of the action research project and its objectives were refined through further discussions during the late Fall of 1981. It was agreed that Jon Knudson would be the "client", and his VP of Employee Relations, Bruce Holmes would serve as Project Manager. I was invited to join the research team that Tichy was assembling, along with four other doctoral students at various stages of completion of ISR's Organizational Psychology program. The project

began with instrument development activities in January 1982 and terminated with the implementation of action plans in late spring 1983.

Wave 2. Jon Knudson was cognizant of the fact that it would take several years for the changes implemented to improve human resource management in ECG to have the intended effect. Thus he tacitly agreed to a follow-up study (three years later) to measure progress toward attaining Wave 1 goals. The potential for engaging in a stream of longitudinal research on strategic human resource management and organizational change was particularly appealing to me. As the schedule for selecting my thesis topic roughly coincided with the timetable for Wave 2 data collection, I approached Noel Tichy in the Summer of 1984 with my interest in conducting the follow-up study for my dissertation research. A meeting was then held in Ann Arbor in late August with the two Human Resources Directors who assumed Bruce Holmes' responsibilities following the 1983 restructuring of ECG.

During the meeting, we reviewed progress in human resource management's support of the strategic change initiatives as well as other organizational changes since Wave 1. The appropriateness of the timing of the follow-up study was also discussed, given that ECG had been restructured following Wave 1 and that some modifications in upper level managerial positions had occurred. Based on these discussions, Noel Tichy and I developed a proposal for

Wave 2 that was submitted to the co-directors of Human Resources for their review and approval. Discussions over the next several months led to modifications in the proposal and timetable. By early spring of 1985, agreement was reached on project design and scope. The contract was signed for the second phase of the project and I was appointed as Project Manager.

Detailed information about the sample, conceptual frameworks, and instrumentation will be provided in Chapter Three. First, the research questions and objectives culled from the action research project that guide this inquiry will be reviewed.

Research Framework and Questions Guiding this Study

As Project Manager for Wave 2 of the study, I soon identified the classic mix of opportunities and constraints regarding the research questions I would be able to address. The Wave 1 theoretical frameworks used, survey and interview data collected, key findings and conclusions, action plans and interventions within the context of Sterling Industries' Electronic Components Group necessarily limited my ability to broaden the scope of the follow-up study--both for the purposes of this thesis and subsequent inquiry.

However, the assemblage of these various elements, complemented by a review of the relevant literatures, contributed to developing a framework to guide the research. A schematic of the strategic human resource management study design outlining longitudinal relationships between human

resources management and organizational performance variables is illustrated in Figure 1.2.

The Wave 1 results were considered baseline data. Thus, it was incumbent upon the follow-up study to evaluate the direction and magnitude of change from that point to see if the interventions designed and implemented had the desired impact. I was able, however, to incorporate variables that filled in some gaps retrospectively apparent in the first study. This choice necessitated the deletion of yet other variables (e.g., career management, innovation of human resource practices, attitudes) that would be peripheral to this research but would have allowed for longitudinal research in other interesting and important areas.

More specifically, I expanded the scope and potential academic contributions of the study through the acquisition of longitudinal business unit archival data: financial and productivity performance variables from 1982 through 1986, strategy variables for 1986,[11] and an internally conducted ranking and analysis of ECG's top twenty competitors for 1985 and 1986. These data allow for (1) building and testing theory about the relationships between a set of specific contextual, organizational, HRM, business strategy

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[11] ECG totally revamped its strategic planning process in 1986. An internally consistent, formalized method that systematically evaluates stage of business cycle, market share, financial performance and environmental factors in the strategy formulation stage was implemented. 1982-1985 strategy variables were not available for this study.

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Figure 1.2 Schematic of Longitudinal SHRM Study Design
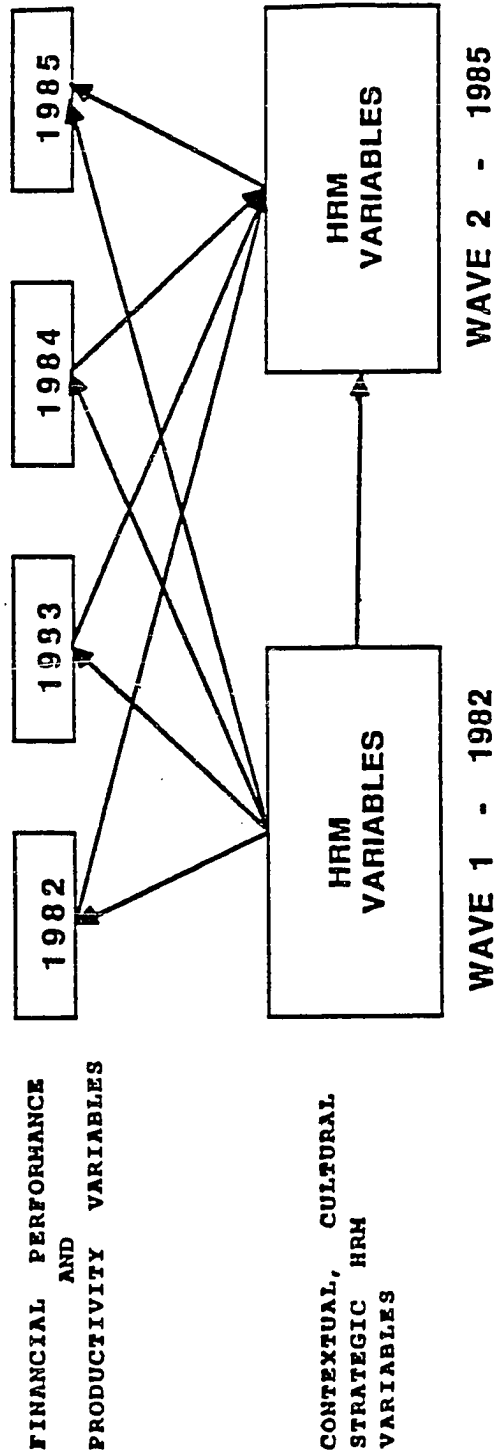
and performance variables, and (2) exploring the direction and magnitude of relationships between human resources performance, quality of HR practices, culture, and overall business strategy, financial performance and productivity.

Unequivocally, the design and scope of the ECG multiple business unit, longitudinal change study provides ample opportunity to empirically examine a number of challenging research questions. For reasons of parsimony, I elected an incremental approach and chose a set of specific human resources and organizational performance variables to examine. These findings were to serve as the platform for developing a longitudinal stream of research.

Thus, for the purposes of this thesis, in the context of ECG, my immediate goals are focused on addressing these specific research questions:

1. What is the direction and magnitude of the relationship between strategic human resource management and business performance? Does the utilization of human resource management practices to implement business strategy impact financial performance and productivity? Or does strong business performance effect strategic human resource management?

2. What is the direction and magnitude of the relationship between human resources effectiveness and business performance? In other words, do effective people practices lead to good financial performance and productivity or vice-versa?

Research Objectives

To address these questions, the objectives associated with these research questions are simply (1) to develop a

conceptual model that would allow for the examination of the relationships between these variables at multiple levels of analysis, (2) to empirically test the relationships delineated in the model, and (3) to present the results and discuss their implications for theory and practice. As such, the empirical investigation focuses on the relationship between ECG's strategic human resources practices, HR effectiveness, and organizational performance. The analyses have been restricted to data collected for the 1982-1985 timeframe which is when the SHRM action research change study was conducted.

Preliminary Conceptual Model

Figure 1.3 presents a conceptual model loosely derived from the ECG longitudinal SHRM study design. In its current (and preliminary) form, it is simply comprised of two human resource management and two organizational performance constructs. The model is designed to empirically test the longitudinal relationships between a set of HR-Strategy Linkage, HR Effectiveness, Financial Performance, and Productivity variables that represent these constructs and address the research questions. Further, it is introduced here to provide a conceptual roadmap for this research.

The detailed operationalization of the constructs and the presentation of a refined, more complete version of the model are reserved for the methods chapter in this thesis. A set of general propositions to be tested regarding these relationships, though, are possible and are now presented.
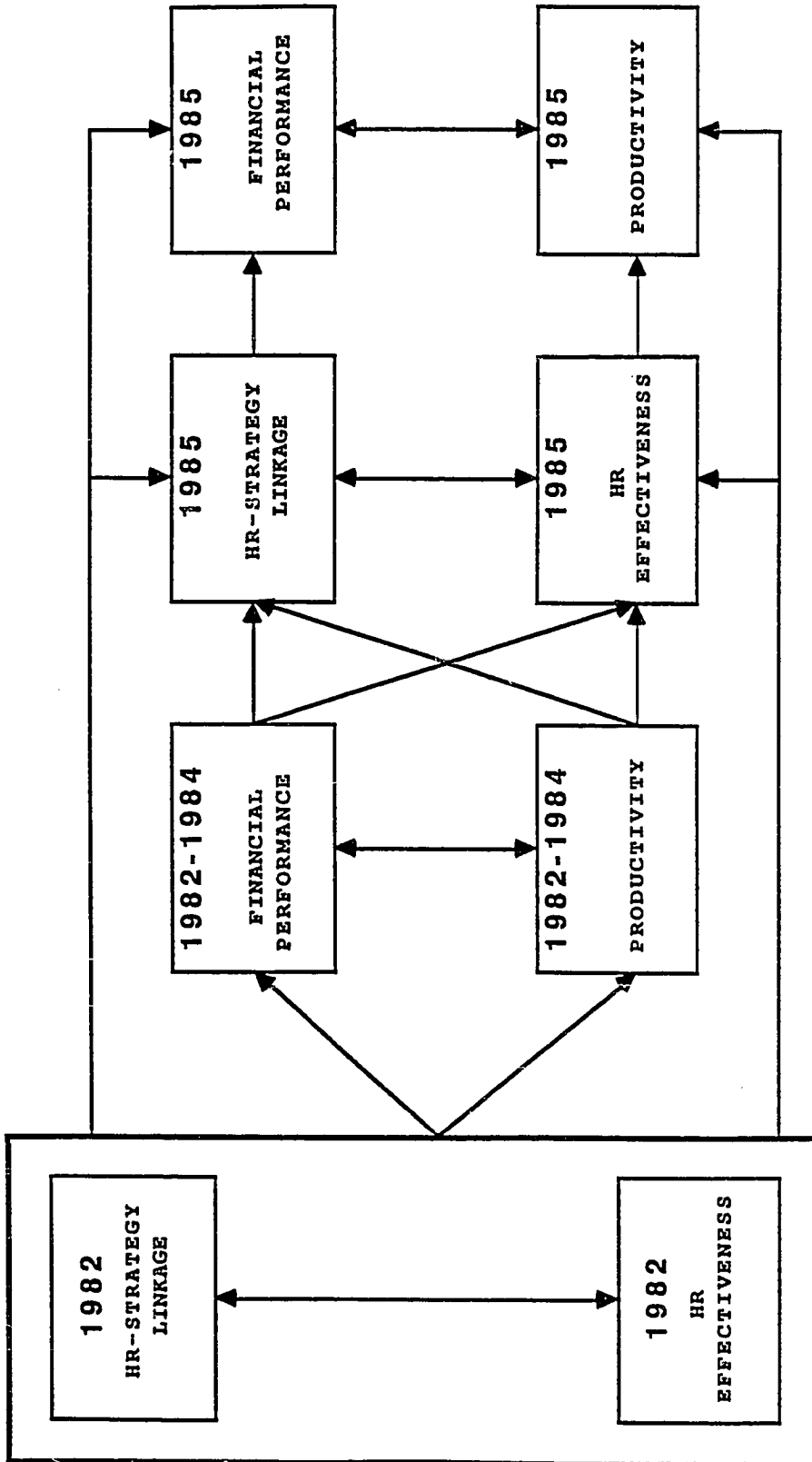
FIGURE 1.3 CONCEPTUAL MODEL OF THE RELATIONSHIP BETWEEN HRM AND ORGANIZATIONAL PERFORMANCE

Research Propositions

The research questions, though few in number, and the conceptual model presented above make possible the formulation of several general propositions regarding the relationships between these variables. If, indeed human resources management does effect the bottom line in the short-run as well as long-term, as many scholars and practitioners contend, then in the case of ECG,

(1) the 1982 HRM variables should have significant effects on the 1982 organizational performance measures,

(2) the 1985 HRM variables should have significant effects on the 1985 organizational performance measures,

(3) with improvement in HRM capability and effectiveness, the effects of the 1985 HRM variables on 1985 organizational performance should be greater in strength and number than the 1982 cross-sectional effects,

(4) the effects of the 1982 HRM variables on the 1983-1985 performance measures should be greater in strength and number than the 1982 cross-sectional effects,

(5) the effects of the 1982 HRM variables on 1983-1985 performance should be greater in strength and number than the effects of the 1982-1984 organizational performance variables on the 1985 HRM variables, and

(6) the amount of variance in the performance measures explained by the HRM variables should be greater than the variance in the HRM variables explained by the performance measures.

The empirical testing of these general propositions in later chapters will help resolve the thorny question of whether effective human resource management really does make

a difference. Theory undergirding these propositions will be further explicated in subsequent chapters of this thesis.

Though a primary objective of this dissertation is theory testing, the exploratory nature of the study also lends itself nicely to theory building for further research. More will be said about this later. First, an overview of the chapters that follow.

Organization of This Thesis

This thesis is organized into seven chapters. In Chapter Two, a review of the emerging strategic human resource management literature is presented. The current state of SHRM, definitional and research issues, theoretical and practical relevance, and research findings are discussed. An assessment of scholarly and practical challenges that confront the field is provided. These are then linked to the specific objectives of this research.

Chapter Three presents the study and methods employed. Detailed information about the sample, frameworks, instruments, measures, data collection procedures, and levels of analyses that are the focal point of this research are provided. The research design and conceptual model illustrating relationships between the human resources and organizational performance variables examined in this study are also discussed. A summary of key findings from Wave 1 and Wave 2 is presented, and key interventions designed to enhance HR effectiveness and strategic performance are also briefly described. The chapter closes with an overview of

the analytical methods employed at the business unit and individual levels of analysis to test the model.

Chapter Four presents results of the univariate, bivariate, and multivariate analyses conducted to develop the indices for the conceptual model. A refined version of the model that includes the indices derived from factor analytical procedures is also presented.

Chapter Five first reviews the results of the ANOVAs performed to evaluate whether significant differences exist between the business units on these variables. The chapter closes with an evaluation of the results of the correlational analysis conducted to empirically examine the relationships between the HRM and organizational performance variables at the business unit level.

In Chapter Six, the focal point shifts to the individual level of analysis. The results of the cross-sectional regression analyses to examine the relationships between the 1982 HRM indices and the 1982 financial performance and productivity measures are first presented. Then the results of the cross-lagged regression analyses performed to examine the relationships between the 1982 HR indices and subsequent financial performance and productivity are evaluated. Also examined is the relationship between the Wave 1 and Wave 2 HRM indices. The chapter concludes with an examination of the lagged effects of financial performance and productivity on the Wave 2 HR

indices and an overall summary of key findings derived from the regression analyses.

Finally, Chapter Seven discusses the major findings and conclusions of the study, implications for theory and practice, and directions for future research. On to Chapter Two.

CHAPTER TWO

STRATEGIC HUMAN RESOURCE MANAGEMENT: STATE OF THE ART, PROMISES, AND CHALLENGES

They [the Americans] have all a lively faith
in the perfectability of man . . . they all
consider society as a body in a state of
improvement . . . and they admit that what
appears to them today to be good, may be
superseded by something better tomorrow.

> Alexis de Tocqueville
> Democracy in America

Sergeant, don't ever involve me in another
personnel matter--the entire area's a
quagmire.

> Lieutenant Buntz to Sergeant Yablonski--
> from an episode of Hill Street Blues

Introduction

It is common knowledge that HRM was once known as
personnel administration, and the function's role and
orientation in many organizations was largely focused on
traditional operational administrative activities. In this
chapter, a brief overview of historical developments in the
field is first presented followed by an assessment of the
differences between personnel administration, HRM and
strategic human resource management (SHRM). SHRM
definitional issues are then addressed. Next, critical
evaluations of HRM and difficulties encountered in

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conducting research on strategic human resource management are discussed. An overview is then provided of the various SHRM approaches that have appeared in the literature linking HRM to business strategy. Next, HRM's relationship to organizational performance and competitive advantage is explored. The chapter concludes with the identification of several SHRM issues and research challenges confronting the field and a summary of the research objectives on which this thesis focuses.

Human Resource Management--An Historical Overview

Though writings about management and organizations can be traced back to the earliest recorded history of commerce, the early organizations of the Egyptians, Hebrews, Greeks, and Romans, and even the Bible, the origins of organizational theory (OT) are perhaps more directly associated with the industrial revolution in England (Shaffritz and Ott, 1987). Since human resource management is rooted in organizational theory, its development as a field closely parallels OT's evolution. For example, evidence exists of an early form of manpower planning that was employed during the industrial revolution (George, 1968). But Frederick Taylor's work on scientific management is widely recognized as the benchmark in the evolution of contemporary human resource management. Table 2.1 depicts the development and orientation of personnel/HRM during the course of this century. The primary forces driving both

practical and scholarly interest in strategic human resource management today are highlighted in Table 2.2.

As both tables suggest, top management in most large organizations has come to recognize that a number of factors beyond awareness of and compliance with government regulations are essential for survival, competitiveness, and growth. They have learned, often painfully, through formidable foreign competition, diminished market share, decreased profits, threats of bankruptcy, and hostile takeover attempts that organizations operate in a complex and ever changing environment. In sum, a key lesson learned is that effective strategic management requires vigilance, identification and responsive interaction with social, economic, technical, political and cultural environments in which the firm operates.

Second, more senior level managers are realizing that effective, progressive human resource management practices may contribute to organizational performance and competitive advantage if integrated with strategic planning--hence, strategic human resource management. HRM practices can be used to drive and support well-defined and communicated strategic objectives such as becoming the premier low-cost producer through increased efficiency (e.g., Lincoln Electric, Donnelly Mirrors) or high quality market leader in specialized market niches (e.g., IBM, Hewlett-Packard). The effective integration of human resource management with the overall strategic management of the firm, however, requires

Timeframe	Orientation	Key Events/Developments
Table 2.1. **Evolution of HRM in the Twentieth Century**		
Early 1900s to WWI	Operational	Scientific management is popularized by Taylor and the Gilbreths. Key premise: effective application of industrial engineering techniques in determining the "one best way" of performing work would benefit management (increased productivity) and laborers (greater rewards or incentives).
WWI to the Depression	Operational	War spurs rapid economic growth and industrialization. Personnel departments are established in many large manufacturing firms to offset unionization drives & gains. Classic Hawthorne studies mark the beginning of the Human Relations movement. Key premise: meeting the social needs of workers and groups would facilitate achievement of organizational goals.
Depression to Mid-1960s	Operational	Suffering economy, massive layoffs, unemployment, and worker disenchantment caused by the Depression escalate unionization activities. Personnel function begrudgingly accepts unions and adapts to collective bargaining processes. Unionization activity plateaus in 1953, with 42% of all manufacturing organized. By 1987, figure drops to 25.8%. Progressive personnel practices contribute to its demise--personnel function gains more credibility as recruiting, development, and

Table 2.1. Evolution of HRM in the Twentieth Century (continued)

Timeframe	Orientation	Key Events/Developments
		compensation practices increase in importance and activity to meet demand for white collar professionals.
Mid-1960s to Mid-1970s	Operational/ Managerial	Passage of EEOC and AA legislation leads to increased responsibility for personnel which grows in stature and importance.
		High technology businesses demand increasing numbers of talented individuals. Corporate performance becomes more dependent on attracting, holding, and motivating individual workers.
		Personnel function becomes more managerial in focus and level of activity to handle accountability to government agencies, administration of employee procedures, and compilation and maintenance of employee data.
Mid-1970s to Late-1980s	Operational, Managerial, and Strategic	Severe environmental jolts and change (oil crises, recessions, aging baby boomers, etc.) pressure need for better management of human resources.
		Personnel Administration undergoes a name change that reflects its coming of age and greater responsibilities.
		Strategic HRM evolves, but practice continues to outpace theoretical development.

Table 2.2 Forces Stimulating Interest in SHRM

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1. globalization of markets and increasing international competition, particularly from the Far East

2. increasing complexity in the structure and size of organizations

3. slower growth or declining markets in a great many industries; rapid growth in high tech and service industries

4. greater government involvement in human resource practices

5. changing demographics (e.g, age, education) and values of the workforce

6. growing concern with both career and life satisfaction

7. changes in the nature of work and design of jobs

8. the search for competitive advantage within specific industries

9. models of excellence (e.g., Peters & Waterman, 1982)

10. the failure of personnel management in promoting the potential benefits of the effective management of people

11. the decline in trade union pressure

Source: adapted from Beer, Spector, Lawrence, Mills and Walton (1985) and Guest (1987)

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attention to HRM policy issues, concerted effort and teamwork on the part of senior management, line and staff, and the development, implementation, and continual refinement of specific practices to drive and support strategic objectives.

Personnel Administration and HRM--A Comparison

Human Resource Management differs from traditional Personnel Administration in several dimensions. Table 2.3 presents a partial list of stereotypes of Personnel Administration and HRM that highlights key differences. These stereotypes can be misleading, however. A loose interpretation suggests that HRM is long-term, proactive, strategic, and integrated, which obviously is not always the case. Some organizations, for example, have simply renamed their Personnel functions Human Resource Management without any distinctive changes in roles or orientation. Thus it is important to differentiate between non-strategic and strategic HRM approaches. Non-strategic differs from strategic HRM in that it is a peripheral rather than integral part of the business, not linked to strategy, reactive, short-term, administratively oriented, and of marginal or no interest to senior-level management.

Strategic Human Resource Management: Definitional Issues

Though there may be some agreement regarding the dimensions on which SHRM differs from HRM, particularly in the nature of its relationship to the overall strategy of

Table 2.3   Stereotypes of Personnel Management and HRM

	Personnel Management	HRM
Time and Planning Perspective	Short-term reactive ad hoc marginal	Long-term proactive strategic integrated
Psychological Contract	Compliance	Commitment
Control Systems	External control	Self-control
Employee Relations Perspective	Pluralist collective low trust	Unitarist individual high trust
Preferred Structures/ Systems	Bureaucratic/ mechanistic centralized formal defined roles	Organic devolved flexible roles
Roles	Specialist/ professional	Largely integrated into line management
Evaluation	Cost-minimization	Maximum utilization (human asset accounting)

Source: Guest, D.E. Human resource management and
industrial relations. _Journal of Management
Studies_, Vol. 24, no. 5, 1987, p. 507.

the firm, there is some disparity in the literature regarding a common definition of the term. Some writers have opted to focus specifically on HR strategy, defining it in terms of quantity and quality of human resources, functional area skills, and managerial types (Wils and Dyer, 1984) or as a pattern in a stream of HR-related decisions which may occur at various levels in the organization (deBejar and Milkovich, 1984). Others have argued that there is a strategic component of HRM that a definition must explicitly or implicitly articulate (Beer et al., 1985; Guest, 1987). For example, Beer and his colleagues defined HRM as "the development of all aspects of an organizational context so that they will encourage and even direct managerial behavior with regard to people" (1985:4).

There are also writers on SHRM theory and practice who have outlined compelling reasons for integrating strategic planning and human resource management functions yet have conspicuously shyed away from formally defining the concept (Fombrun, Tichy and Devanna, 1984; Foulkes, 1986). At the other end of the spectrum, Lengnick-Hall and Lengnick-Hall (1988) have taken the position that SHRM is a construct with two dimensions: organizational goals and the availability/obtainability of human resources. But whether SHRM can be considered a construct at this juncture is arguable.

To help resolve definitional problems and provide a point of departure for future research, Miller (1987:352) defined SHRM as

> . . . those decisions and actions which concern the management of employees at all levels in the business and which are related to the implementation of strategies directed towards creating and sustaining competitive advantage.

Miller's definition is noteworthy in comparison to others that have appeared in the literature and consequently is employed for the purposes of this thesis. It encompasses policy issues and decision-making regarding the appropriate attraction, recruitment, selection, placement, appraisal, compensation, training and development, and promotion of human resources at all organizational levels to support and drive an organization's strategic objectives. Implicitly, it also considers the effective management of organizational culture and labor relations to achieve and sustain competitive advantages.

Critical Evaluations of HRM Practice

The nature of the field today is such that it remains unclear how many and which companies/industries are successfully employing HRM practices with the intention of driving strategic organizational performance and sustaining competitive advantages. Jain and Murray (1984) contended that (1) only a small proportion of all work organizations have voluntarily adopted the "best HRM practices," (2) that some of the so-called "best practices" are actually short-

term fads that fade into the background after a few years, and (3) though many organizations have adopted progressive HRM practices "on paper," follow-through or implementation leaves much to be desired.

From another perspective, there are many companies that do not explicitly practice effective human resource management and yet are considered to be successful, at least in terms of financial performance and market share. Pettigrew's (1985) extensive study of strategic change at ICI is a case in point. Why was there little mention of the role and impact of HRM on ICI's performance as it experienced and recovered from downturns in its markets?

Also to be considered are companies that do exhibit many of the characteristics of effective HRM but are unsuccessful. For example, several of the companies that made the 1982 In Search of Excellence roster experienced dismal performance a short two years later. W.T. Grant exhibited seven of the eight attributes of excellent companies identified by Peters and Waterman (1982) and yet the organization still failed.

Guest (1987) noted that though the term human resource management is not new, it has become quite fashionable. He asserted that whether HRM is here to stay or is just a passing fad depends on (1) the persistence of the pressures that have escalated interest in HRM, (2) the distinctiveness of HRM compared to traditional forms of personnel management, (3) the utility and validity of any underlying

"theory," (4) evidence of the impact or success of HRM, and (5) its relevance to differing cultural contexts.

In a provocative article, Skinner (1981) questioned the payoff of the multitude of progressive HRM programs and initiatives that had been developed and launched in recent years in terms of increased productivity, reductions in strikes, better labor relations, and better strategic positions of companies. Many factors have also impeded progress in elevating the orientation of the HR function to the strategic level. Strategic human resource management, too, has been the target of recent criticism. Hax (1987:11) asserted that

> . . . in spite of growing interest, the strategic management of human resources is far from a reality in most American enterprises. The formulation of corporate and business strategies is becoming commonplace, but the issue of human resources is not being addressed with an appropriate sense of priority. Rather, the personnel requirements of those strategies are identified after the fact and passed along to personnel managers for them to supply the necessary workers at the various skill levels demanded by the strategic plans.
>
> This practice not only diminishes the strategic role of human resources, but also fails to recognize that the effective use of human resources involves every line manager in the organization. It is not a staff activity to be relegated exclusively to the personnel function.

Fombrun and Tichy (1984:320) also pointed out that many HR executives were falling short in delivering what was needed once they gained their CEO's attention and approval

for participation in strategy formulation and implementation
initiatives:

> For one reason or another, [senior-level
> executives] are convinced that senior
> personnel officers should play a more
> proactive role in the formulation of
> strategic directions if those strategies are
> to be successfully implemented. Yet when
> they turn to their personnel departments for
> help, all too often they find them ill
> equipped to deliver information or expertise.

More support could also be provided by scholars
actively conducting research on SHRM. Much of what can be
considered state-of-the-art in strategic selection,
appraisals, compensation, training and development, and
career development has originated in the field. Similar to
Organizational Development, the practice of strategic human
resource management is advancing at a far greater pace than
is theory. To complicate matters, there is little consensus
regarding a common definition of strategic human resource
management. This is partly because the HRM function
historically has not been consistently thought of as
strategic by either academicians or practitioners.
Consequently, insufficient attention has been paid to
developing tools and methods for managing human resources
strategically.

On a more positive note, advances have been made in
SHRM research and practice. Conceptually, some new tools
have been developed and successfully employed. Beyond
changes in CEO philosophy and values regarding HRM, senior
managers' recognition of HRM's value-added and also the

caliber of people manning the HR function itself have played a part in many organizations. Some companies require candidates for senior management positions to "punch their ticket" in HR staff positions as part of their developmental experience. This practice is based on the belief that good line managers are also good HR managers. Many other innovative practices have been and continue to be spawned in the trenches to meet business needs.

The pool of HR talent, too, is considerably better than it has been historically, though demand continues to exceed supply. In addition, qualified candidates with established track records in key line and non-HR staff positions more frequently are being called upon to head up the HR function in many top U.S. companies. Leadership skills, management capability, business experience, credibility, ethical values and beliefs, political astuteness, and knowledge of strategic planning are several of the goods brought to the table when another line or staff senior manager is selected to head the HR function. However, these benefits may be off-set by costs--the loss of sorely needed specialized skills, sensitivity to the needs of the function, and HR talent.

Difficulties in Conducting Research on HRM Strategy

Kochan and Chalykoff (1987:183) recently penned a particularly critical assessment of the current state of the field and HRM research orientation:

> In no field of the social and behavioral
> sciences other than human resource management
> has organizational practice, management
> consulting, prescriptive academic and
> textbook writing, or teaching so far
> outstripped theory and hard empirical
> evidence. The lack of a sound theoretical
> foundation in the face of a growing demand
> for information by practitioners has led to
> the proliferation of a popular literature
> that focuses on process rather than content
> issues.

But conducting research on human resource management and strategy to explore linkages and offer prescriptions for effective practice is no easy task. Harrigan (1983) succinctly pointed out that: "strategy research needs sophisticated research methodologies because it treats a complex topic--business strategy is a difficult to measure construct."

Conducting SHRM research tends to be even more complicated than business strategy research in that not only must the components of HRM policies and practices be studied, the organization's corporate strategy and linkages to HRM strategy must also be evaluated. This is difficult to accomplish as most corporations are reluctant to publish or disclose their strategies for reasons of product and competitive advantage. Miller (1987:360) points to another problem with current approaches to research on corporate strategy:

> [Researching strategy as it emerges] . . .
> is unlikely to generate samples large enough
> to test specific hypotheses. If the
> researcher is required to obtain all of the
> information necessary to understand what
> strategic decisions have been and are being
> made, then the number of organizations that

> can be studied is very limited. Similarly,
> 'perceptual bias, limited access to key
> decisions, implicit theory' (Hambrick and
> Snow, 1980) all make this form of research
> hazardous. Furthermore, because the
> observations made are of strategic
> **implementation**, we make the heroic assumption
> that what is being implemented is that which
> has been decided.

He concluded that "there is no doubt that the strategic management of human resources is a neglected field in the study of business" largely because "it is difficult to recognize an organization's approach to the management of its employees."

Approaches to SHRM: A Review of the Literature

Strategic human resource management has its origins in the human resource management and business policy/strategy literatures, both of which are quite sizeable. Despite its expansive roots, there is a paucity of SHRM literature which is uneven and scattered--not surprising given the relative youthfulness of the field and the diverse backgrounds of writers on the topic. A recent attempt by Lengnick-Hall and Lengnick-Hall (1988) to organize the literature resulted in the generation of four categories: (1) human resources valuation, (2) human resources planning, (3) responses to strategic changes in the environment, and (4) matching human resources to strategic or organizational conditions. This categorization scheme generally captures the broad spectrum of the SHRM literature. However, given the objectives of this dissertation research, I will focus my review on three narrower, non-mutually exclusive categories that encompass

Table 2.4 - Approaches to Strategic Human Resource Management

APPROACH	REPRESENTATIVE AUTHOR(S)	CONTRIBUTIONS
Group I		
Matching Specific HRM Practices to Business Strategy	Wright (1974) Hofer & Davoust (1977) Leontiades (1982) Wissema et al. (1982) Herbert & Davoust (1987)	•Supported a normative approach to business strategy/manager "fit" •Argued that senior management characteristics should reflect the knowledge, skills, attitudes, and perspectives required to meet different task demands
	Devanna, Fombrun & Tichy (1981) Tichy, Fombrun, & Devanna (1982)	•Concluded that HR activities are largely driven by business mission and strategy, but also are affected by external conditions •Discussed matching specific HRM practices to business strategy •Contended that there are three strategic selection concerns: (1) designing an organization-wide selection and promotion system that supports the organization's mission; (2) creating internal flows of people to match business strategy, and (3) matching key executives to business strategy
	Migliore (1982) Lawler (1982) Milkovich (1986)	•Discussed matching performance appraisal and compensation practices to business strategy
	Hall (1986) Odiorne (1986)	•Discussed matching training and development and career development to long-range business objectives
	Mahler & Drotter (1986)	•Discussed a systems approach to succession planning that can impact successful attainment of organizational objectives
	McLaughlin (1983)	•Argued that achieving employee-company and employee-job fit below senior management levels is also essential to effective performance •Called for more emphasis on the individual work unit and business entity for all key HRM practices •Contended that more intensive utilization of psychological and sociological research would contribute to increasing the effectiveness of HRM practices
	Gupta (1984, 1986)	•Assessed pros and cons of matching managers to strategies and suggested criteria to consider in deciding whether to employ a normative approach •Identified four constraining forces against fitting managers to strategies: (1) need for strategic flexibility; (2) need for management development; (3) motivational problems; (4) lack of managerial discretion
Group II		
Linking HR Planning to Strategic Planning	Nininger (1982)	•Developed a research-based framework useful for enhancing organizational effectiveness through the integration of HRP and strategic business planning & management •Established guidelines or principles that were considered important in integrating HRP with strategic business planning •Chronicled a case study of an unidentified Canadian firm in which a model was developed based on the premise that HR Planning and Strategic Planning should be conducted as parallel processes then linked together

Table 2.4--continued

APPROACH	REPRESENTATIVE AUTHOR(S)	CONTRIBUTIONS
		process, the nature of its interaction with the environment, and functional areas, including HR •Investigated the relationship between HRM practices and the strategic archetypes, and presented guidelines for the design of strategic HRM systems to complement or "fit" the Defender, Prospector, and Analyzer strategic orientations
	Fombrun, Tichy & Devanna (1984)	•Developed a framework for conceptualizing human resource management, linked HRM to general strategic management, and described some applications of HRM as a strategic tool for achieving organizational goals •Built from Anthony's (1965) three levels of managerial work and described how the four key HRM practices (selection, appraisals, rewards, training and development) could be employed at strategic, managerial, and operational levels as tools for achieving organizational objectives •The dependent variable in their framework is performance--the HR elements are designed to impact performance at both the individual and organizational levels •Assumed high interdependence among the elements of the framework (HR Cycle)--the HR system was viewed only as strong as its weakest link
	Odiorne (1985)	•Attempted to translate the economic theory of human capital into strategies for managing people as revenue-generating human assets •Developed a portfolio approach to managing human assets--employees are arrayed within a 2x2 matrix according to productivity and growth potential as Stars, Work Horses, Question Marks, and Dogs •Offered suggestions for enhancing the investment an organization makes in human capital and linked the portfolio approach to business and HR planning •Offered prescriptions for managing human resources in each category and discussed key HRM practices necessary to support the portfolio method
	deBejar & Milkovich (1985)	•Conducted an ambitious cross-sectional study to empirically derive and test the relationships between Business Unit and HR Strategy •Developed a model that proposes that Business Strategy is a fundamental source of HR contingencies and thus helps shape HR strategy •Identified four specific components of HR Strategy: (1) domain, (2) deployment, (3) synergy, and (4) competitive avantages
	Beer et al. (1985)	•Argued for the linkage of a firm's external strategy with its internal strategy which determines how human resources are to be developed, deployed, motivated and controlled •Argued that the GM must assume responsibility for ensuring alignment of competitive strategy, HRM policies, and other policies affecting people •Asserted that the mission of HR staff is to set policies that govern how personnel activities are developed and implemented

Table 2.4--continued

APPROACH	REPRESENTATIVE AUTHOR(S)	CONTRIBUTIONS
	Baird et al. (1983)	• Developed a model based on the more traditional assumption that HRP is driven by strategic business planning • Differs from other traditional models in that: (1) culture is an explicit input into the model; (2) the information necessary for developing and implementing a strategic plan is scattered throughout the organization; (3) people resources are considered as valuable assets who are responsible for achieving plans; (4) developing HR strategy is an interactive process that cannot simply be formulated by strategists and imposed on others; (5) participation within and across organization levels and the HR function itself is the key to successfully linking HRP and strategic business planning
	Milkovich et al. (1983)	• Identified four key elements of comprehensive HRP processes that carry over into SHRM initiatives: (1) linking HR plans to strategic business plans; (2) analyzing internal and external environments; (3) designing and considering HR programs; (4) evaluating results
	Dyer (1986)	• Developed a typology comprised of purposes, populations, and planning processes that is useful for sorting HRP approaches into two categories: (1) the focused approach (emphasizes staffing, short-term planning process, targeted to a limited number of units or employee groups, and (2) the comprehensive approach (multiple activity, longer-term, whole population orientation) • Argued that a clearer un...rstanding and more complete classification of the events that precipitate and shape HRP is necessary prior to prescriptive theory building
	Golden & Ramanujam (1985)	• Developed a research-based typology comprised of four different types of linkages between HRP and strategic planning: (1) administrative: little to no linkage, evident in firms where HRM performs traditional administrative tasks; (2) one-way: strategic planning drives HRP (most common) or vice-versa; (3) reciprocal and interdependent: strategic planning and HRP occur as parallel processes that are eventually interwoven; (4) integrative: involves and interactive relationship between strategic planning and HRP
Group III Conceptual Frameworks, Models, and Typologies Linking HRM to Business Strategy	Galbraith & Nathanson (1978) Galbraith & Kazanjian (1986)	• Developed a strategy implementation model that identified the role of specific HRM practices in the implementation process • Discussed fitting performance measures, rewards, career paths and leadership style to strategy and structure • Built upon congruence and open systems premises to illustrate the relationships between these variables--should changes in one or more HRM practices occur, then other dimensions must be altered to maintain "fit"
	Miles & Snow (1978, 1984)	• Identified four archetypes of organizational adaptation: Prospectors, Analyzers, Defenders, and Reactors, each of which purportedly vary in internal structure and

Table 2.4--continued

APPROACH	REPRESENTATIVE AUTHOR(S)	CONTRIBUTIONS
	Guest (1987)	•Developed a framework comprised of employee influence, managing human resource flow, reward systems, and work systems •Defined HRM as "the development of all aspects of an organizational context so that they will encourage and even direct managerial behavior with regard to people" •Proposed a theory of HRM with strategic implications that incorporates four goals: integration, employee commitment, flexibility/adaptability, and quality •Developed propositions for each of the elements of the framework and also provided a set of prescriptive policies
	Schuler & Jackson (1987)	•Empirically investigated the relationship between business and HR strategy and developed three strategy archetypes: innovation, quality-enhancement, and cost reduction •Contended that eight distinctive role behaviors were associated with each strategy and that organizations can choose from six "menus" consisting of planning, staffing, appraising, compensating, and training and development when deciding what HRM practices to use for linking with competitive strategy •Noted that though an organization may pursue a primary strategy, in reality, other strategies are often pursued simultaneously--consequently, all components of an HRM system need to be changed and implemented simultaneously to stimulate and reinforce specific employee behavior necessary to support the business strategy
	Baird & Meshoulam (1988)	•Proposed a model for developing and implementing HRM strategies that incorporate both external and internal "fit" issues (external pertains to the congruence between HRM and the stage of the organizational life cycle; internal pertains to how well the HRM components complement and support each other) •Viewed HRM as having five developmental stages and six strategic components, which are combined to form the HR Strategic Matrix, a management tool useful for developing an organization's HRM profile •Contended that external and internal "fits" interact and must be managed simultaneously to optimize HR effectiveness and efficiency
	Lengnick-Hall & Lengnick-Hall (1988)	•Developed the "Growth/Readiness Matrix"--a typology of the strategic management of human resources. It is comprised of four elements: Expansion, Development, Productivity, and Redirection •Asserted that corporate growth expectations are a proxy for the goals of the organization and that readiness is a proxy for implementation feasibility, indicating how well resources meet the needs of the situation •Contended that movement from one quadrant of the matrix to another results from an interaction between environmental conditions and organizational choice--consequently, they propose a contingency approach in which organizational choices influence the rate and direction of organization life stages. Organization goals and the availability/obtainability of human resources represent the construct of SHRM in their view. •Presented a set of testable theoretical propositions derived from their typology

the large majority of SHRM approaches evident in the literature. Table 2.4 illustrates these categories, identifies representative authors, and provides a description of their key findings and contributions.

I: <u>Matching Specific HRM Practices to Business Strategy</u>

Included in this category are articles that focus on matching strategic business objectives to: (1) recruitment/selection/staffing and promotion practices (Leontiades, 1982; Migliore, 1982), and (2) the linkage of performance appraisals, compensation (Migliore, 1982; Lawler, 1982; Milkovich, 1986), training and management development (Odiorne, 1988), and career development (Hall, 1986). One of the key observations regarding organizational performance and the match between specific HRM practices and business strategy was noted by Gupta (1984). He pointed out that though the strategy-manager fit premise is intuitively appealing,

> . . . its primary weakness lies in a common and almost total reliance on vague, unanchored, and untestable terms--such as "opportunistic milker," "caretaker," "activist"--for operationalizing managerial characteristics. At least on a prima facie basis, it seems that each of these terms has embedded in it certain assumptions about a multiplicity of managerial characteristics, for example, functional background, risk propensity, interpersonal orientation (1984:401).

His conclusion? There is a strong <u>a priori</u> case for expecting contingency linkages between strategy and GM characteristics, but to be meaningful, future research

should concentrate on a multitude of precisely defined dimensions of both strategy and managerial characteristics.

II: <u>Linking HR Planning to Strategic Business Planning</u>

The approaches in this category build on several years of research that focused on linking human resource planning to strategic business planning (Vetter, 1967; Walker, 1980; Nininger, 1982; Milkovich et al., 1983; Dyer, 1986). In general, the purpose of HRP is to narrow the gap between the current inventory of human resources placed in appropriate positions and the future demands for talent to help the firm attain its strategic objectives.

Though a considerable amount of progress has been made in developing HRP and linking it to strategic business planning over the past two decades, only a small percentage of organizations make any systematic attempt to anticipate and provide for the human resource issues/implications associated with strategic business plans (Steiner et al., 1983). A recent study by Hay Associates (1988) found that only 21% of their sample of 2100 firms had a formal, developed human resource planning system, and that HRP was undeveloped or rudimentary in 30% of the firms sampled (Wall Street Journal, 5/17/88).

Not surprisingly, no single definition of HRP has gained widespread acceptance among the scholarly literary community. More than forty definitions and fifty models exist which seem to vary in technical, strategic, managerial, and operational orientations (Milkovich et al.,

1983). Most comprehensive approaches to human resource planning tend to incorporate several key elements which also carry over into SHRM initiatives or programs (see Milkovich et al., 1983).

Concerted efforts to develop human resources planning gained momentum during the 1960s. The passage of the Manpower Development and Training Act of 1964 prompted organizations to help with the placement of workers who lost jobs during the deep recession and high unemployment periods from 1957 to the early 1960s. These early efforts were largely focused on specific HRM practices, particularly selection and staffing.

In an attempt to consolidate the literature, Dyer (1986) developed a typology comprised of several attributes including purposes, populations, and planning processes. Dyer contended that the various HRP techniques could then be sorted into two general categories consisting of the "focused" or "comprehensive" approaches.

In his view, the focused approach emphasizes staffing, is short-term in planning processes, and is targeted to a limited number of units or employee groups compared to the multiple-activity, longer-term, whole population orientation of the comprehensive approach. The comprehensive approach, on the other hand, incorporates a broad range of activities both within and across organizations. It involves "analyzing an organization's human resource needs under changing conditions and developing the activities necessary to

satisfy these needs" (Walker, 1980:5). HRP becomes strategic when some attempt is made to anticipate long-term supply and demand of human resources relative to changing conditions the organization is confronting and use HR department programs in an effort to meet HR needs.

There remains much to learn about the factors that influence an organization's approach to HRP and linkages to strategic business planning. Dyer (1986:28) asserts that

> . . . a clearer understanding and more complete classification of the events that precipitate and shape HRP is essential if we are to develop a prescriptive theory to guide human resource planners in their diagnosis of appropriate organizational conditions and their choice of HRP applications to mesh with these.

III: Conceptual Frameworks, Models, and Typologies Linking SHRM to Business Strategy

Within this category are the several SHRM conceptual models, frameworks, and typologies that focus on the linkage of system-wide HRM policies and/or practices to strategic business planning. Table 2.4 presents key contributions to theory building and practice.

Early empirical research by Miles and Snow (1978) provided a base for their research (1985) on HRM practices and the four strategic archetypes they conceived earlier. Devanna, Fombrun, and Tichy (1984) saw mission and strategy, organization structure, and human resource management as interrelated systems and the three core elements essential for effective organizational functioning. HRM, they argued,

was largely missing from the general strategic management process.

The Devanna, Fombrun, and Tichy framework represents one of the more comprehensive conceptual approaches to strategic human resource management. Building from their conceptual work in 1982, Fombrun, Tichy, and Devanna (1984) viewed HRM practices as a mutually supportive, integrated system at strategic, managerial, and operational levels of managerial activity. They expanded upon each of the key HR practices in their framework at each of the three levels and provided prescriptions regarding the internal organization, staffing, and managing of the HR function and steps that can be undertaken to link the HR function to the user (line) organization. The instruments used in the present study were derived from their conceptual approach to strategic HRM and will be discussed further in the methods section of this thesis.

An ambitious comparative cross-sectional study to empirically derive and test the relationships between business unit and human resource strategy was conducted by deBejar and Milkovich (1985). Drawing from Mintzberg's (1978) classic work, they conceptualized HR strategy as a pattern in a stream of HR-related decisions which may occur at various levels in the organization. Though their research was exploratory and has methodological flaws (e.g., one respondent per business unit), they have contributed to

identifying many of the specific dimensions associated with the relationship between business unit and HR strategy.

Arguing that the Harvard framework cannot be a theory because the authors use it "to embrace human resource management in all contexts" and thus "it is stripped of specific prescriptions," Guest (1987) proposed a more precise theory of HRM, one that also has strategic implications. Drawing largely from the organizational psychology literature and from both the Tichy et al. (1982) and Beer et al. (1985) frameworks, Guest's theory incorporates four goals: integration, employee commitment, flexibility/adaptability, and quality. Propositions were developed for each of the elements of the framework and a set of prescriptive policies were also offered. Guest's work is an important step forward as it develops testable theory regarding human resource management and proposes linkages between human resource policies/outcomes and organizational outcomes.

Schuler and Jackson (1987) also empirically investigated the relationship between business and human resources strategy. They developed three archetypes of competitive strategy and human resource management: innovation, quality-enhancement and cost-reduction. Eight distinctive role behaviors were believed to be associated with each strategy. The authors contended that organizations can choose from six "menus" consisting of planning, staffing, appraising, compensating, and training

and development when deciding what HRM practices to use for linking with competitive strategy.

An important finding derived from their research is that though an organization may pursue a primary strategy such as innovation, in reality, other strategies are often pursued simultaneously. Thus Schuler and Jackson conclude that all components of a human resource management system need to be changed and implemented simultaneously to stimulate and reinforce specific employee behavior necessary to support business strategy. The authors argued that neglecting to invoke a particular practice implies invoking another that may cause employees to experience role ambiguity and conflict, frustration, and stress.

Lengnick-Hall and Lengnick-Hall (1988) build on the contributions of many previous SHRM approaches while also suggesting ways to address many of their deficiencies or limitations. The authors provide an insightful review and integration of the business strategy and SHRM literatures, develop a useful categorization scheme, and offer testable hypotheses to further advance the development of the field.

HRM, Performance, and Competitive Advantage

The relationship between effective human resource management, the financial performance and competitive advantage of organizations has been the subject of much scholarly inquiry and debate recently. Logic dictates that the effective management of human resources has a strong effect on the overall performance and competitive advantage

of the firm, yet concrete evidence is lacking. The results of empirical research on the topic are mixed and inconclusive whereas theoretical research tends to support a strong positive relationship between these variables.

For example, Porter (1985) contended that human resource management can help a firm gain competitive advantage through cost reduction and/or increasing sources of product and service differentiation. Gaining competitive advantage through human resources, from this perspective, suggests that there should be some linkage between a firm's HR activities, its business strategies and performance.

A conceptual model of organizational effectiveness developed by Lewin and Minton (1986) also supports this contention. The human resources function is viewed as one of four essential components of their model that impact organizational effectiveness. The others include goal attainment, the integrative function, and the adaptive function in the organization. The authors claim that their model accounts for most of the descriptive features of excellent or effective organizations as described in the recent popular general management literature.

There is some evidence from empirical studies that suggests that effective HRM can make a difference. For example, some of the industrial-organizational psychology and micro-organizational behavior research on job design (Hackman and Oldham, 1980) and goal setting (Locke and Latham, 1984) demonstrated that higher levels of performance

could be achieved from efforts to manage human resources more effectively. Schmidt and Hunter (1983) found that a 40 percent productivity increase can be achieved if employees are selected such that their average level of output is one standard deviation above the average for employees who otherwise would have been hired for the job.

Case studies of excellent companies, in part, also support the premise that good people practices impact organizational performance. For example, Peters and Waterman (1982) and Kanter (1984) indicated that successful companies tend to practice effective human resource management. Frohman's (1984) in-depth case study of Keithley Instruments also demonstrated the impact on the "bottom line" when a company's human resources department becomes a fully utilized business partner. Mirvis' (1985) case studies of Caterpillar and Graphic Controls chronicled two companies that experienced decline, retrenchment and subsequent turnaround in their markets. These studies are good examples of how business strategies, life cycles of an industry, and company cultures can be incorporated into human resource strategy formulation and implementation processes to develop and sustain competitive advantages.

Schuler and MacMillan (1984) found that competitive advantage can be gained through effective human resource management. The authors provided case examples of 20 companies that successfully pursued two specific strategic thrusts: cost/efficiency, or product differentiation. They

identified four targets of HRM practices that can be used for competitive advantage. These included upstream and downstream stakeholders such as customers, distributors and servicers, and suppliers in addition to the focal company itself. The authors then illustrated how HR planning, staffing, appraising, compensating, training and development, and union-managerial relations were directed toward the "targets" to achieve the cost/efficiency or product differentiation strategic objectives.

Yet several empirical studies have reported mediocre or inconclusive findings. Mitchell (1985) attempted to address the question of whether there is a strong relationship between effectiveness of human resource management and organizational performance. His analysis of the companies chronicled in <u>In Search of Excellence</u> and <u>The 100 Best Companies to Work for In America</u> found that only 21 of the "100 Best Companies" were among the 62 "Excellent" companies and that the value orientations of the two general trade best sellers were considerably different. For example, Peters and Waterman's (1982) book defined excellence from the point of view of top management, where the concern was to optimize performance from all the resources of the organization, including its people. The Levering, Moskowitz and Katz (1984) book, on the other hand, defined effectiveness from the perspective of the employee, where the concern was to achieve satisfaction from his/her job and career. The lack of substantial overlap led Mitchell to

conclude that it is frequently difficult to achieve these two types of effectiveness--the optimal performance of organizational resources in the eyes of top management and employee satisfaction with jobs and careers--within the same company.

Recent empirical studies conducted by Kravetz (1988) and Schuster (1986) also found a positive relationship between human resources and organizational performance, though the results are questionable. Kravetz (1988) collected survey data from 150 of the 1000 largest companies in the U.S. to explore whether companies with progressive management styles, career development programs, significant training efforts, and a people-oriented culture were more profitable than companies that are less progressive. Several critical measures of financial success were also collected for each company (e.g., data over the past five years for sales growth, revenue growth, dividends growth, EPS, and common equity, and the P-E ratio and profit margin for the latest twelve months). The author found that nearly every financial criterion examined was strongly related to human resources progressiveness. More progressive companies had much better financial results. The differences were statistically significant both within and between industries. Kravetz (1988:39) concluded that though all industry groups showed variation in scores, "individual company characteristics would appear to account more for human resources progressiveness than does type of industry."

Schuster (1986) also surveyed the Fortune 1000 largest U.S. industrial companies as well as the 300 largest nonindustrial companies to examine the relationship between HRM practices and financial performance. His questionnaire dealt with six innovative HRM practices: (1) assessment center approach in selection, (2) flexible or "cafeteria" approach in reward system, (3) productivity bonus plan, (4) goal-oriented performance appraisal, (5) alternative work schedules, and (6) organization development. With a 46 percent response rate, Schuster found a statistically significant positive relationship between the use of employee-centered management practices and superior financial performance, measured by Return on Equity (ROE). In addition, his data revealed that the average ROE of those firms using one or more of the innovative practices was 11 percent higher than the average ROE of those firms not using any of the practices.

Both the Kravetz and Schuster studies, however, have methodological problems that raise questions regarding validity. Even though a positive, significant relationship exists between the variables, the correlations are not that large in size. As both studies are cross-sectional, the question of causality and its direction also remains unanswerable--does strong financial performance drive HR performance and effectiveness instead?

Recognizing the limitations imposed by their research methods, both Kravetz and Schuster argued that other

available data support their contentions. Drawing from his interview data which he supplemented with archival data that was available for some of the companies in his sample (e.g., IBM), Kravetz asserted that the relationship probably flows from HR progressiveness to higher organizational performance, "the most logical explanation." Schuster (1986:11), too, argued that

> . . . considerable help in deciding which is the more reasonable interpretation is provided by observing the actual experience of numerous individual firms where the pattern of employee-centered management occurring first and leading to (i.e. causing) superior financial performance is readily apparent . . . the experiences of IBM and Donnelly Mirrors Company . . . make it crystal clear that in these specific cases employee-centered management is the causal variable and superior financial performance is the result.

Though these additional data suggest that progressive and innovative HRM practices impact financial performance, they are insufficient for adequately determining the direction of causality.

Employing Lewin and Minton's (1986) "black box" model, Ondrack (1988) also attempted to address the question of whether or not some relationship can be found between effectiveness in human resource management and financial excellence of the organization. He investigated the hypothesis that organizations judged to be excellent in HRM have higher than the average level of long-term performance for their industry. He replicated the procedure Levering et al. (1984) used to identify the firms in their book, The 100

<u>Best Companies to Work for in America</u> to identify the 100 "Best" Canadian firms. Measures of "good" HRM practices and companies employing them were provided by expert raters. Then the 100 companies were compared to Canada's "Top 600" (equivalent to the Fortune 100), but only 58 firms appeared on this list as the remainder were privately held (consequently, financial performance results were unavailable). Return on Capital (ROC) was the primary outcome variable employed in the study because it tended to minimize the effect of short-term swings in financial performance and was thus considered a fairly stable long-term performance measure as well.

Ondrack's findings, though, are not very encouraging. The five-year ROC average was higher than industry averages for 32 of the companies (55%) and lower for the remainder. The results for the High-Technology companies were an exception, however, as all nine had higher than average ROC. Again, methodological problems may explain the poor results. The "100 Best" may not be a truly valid list of the most effective organizations in HRM, potentially contributing to biased results. Second, the "100 Best" were not systematically compared to the norm for HRM practices in their respective industries, and publicly available financial data could only be obtained for 58 of the firms. Consequently, Ondrack tentatively suggested that it is possible that HRM effectiveness may exert greater leverage on overall performance of firms in specific industries, such

as High-Tech and possibly Services, whereas it may have
little effect on firms in Consumer Products and Heavy
Industry. As such, Ondrack (1988:9) asserts:

> some of our thinking about the strategic role
> of HRM in organizations may have to be
> modified to account for industry differences
> in the leverage power of HRM on
> organizational performance. Financial
> performance or other aspects of
> organizational effectiveness in some
> industries appear to be very sensitive to
> differences in HRM effectiveness while HRM
> may have very little impact in other
> industries.

Ondrack concludes that perhaps a more useful direction
for further research might be to conduct multivariate or
hierarchical regression analysis of the relative impact of
HRM and other aspects of organization effectiveness on
financial performance of the organization. In any event,
more longitudinal studies with more sophisticated research
designs are called for to properly examine the direction and
magnitude of the relationship between these variables to
determine whether or not effective HRM practices do make a
difference. The study on which this thesis is based
provides an opportunity to further explore these
relationships.

<u>Summary</u>

The current state of the SHRM field is both promising
and discouraging. The good news is that the field is quite
young and thus presents engaging opportunities for
theoretical and empirical research. The practice of SHRM is
clearly gaining ground, especially within larger

corporations. Advances and innovations can be found in (1) recruitment, selection, and staffing practices, (2) performance appraisal practices, (3) compensation systems, (4) employee training, development, and career development practices, (5) benefits and policies, and (6) QWL, organizational design, job redesign, and sociotechnical systems initiatives. The field is also attracting the attention of scholars with different perspectives from varying backgrounds.

There is an offshoot of this good news, however. Given the relatively early stage of development of the field, there is no unifying theory of SHRM. Nor is there consensual validation of whether SHRM is a construct or concept and how it might appropriately be defined. Conducting research on SHRM is an extremely difficult task, especially when most organizations are reluctant to reveal their business strategies. The contextual (environmental and organizational) variables that affect and are affected by SHRM have not been clearly identified. The relationships between SHRM and those that have been identified are not well understood. Does the strategic management of human resources lead to stronger organizational performance or vice-versa? Under what conditions and in what industries does SHRM make a difference or even make sense?

The emerging SHRM literature is also becoming quite diverse and scattered. Few attempts have been made to organize the literature. Much of the earlier published work

in the area is in the form of case studies. Another segment is in the form of cross-sectional empirical studies, and a third is in the form of conceptual frameworks, models or typologies, some of which are empirically-based, each of which has particular strengths and weaknesses. Several of the conceptual articles that have been developed also offer theoretical propositions to complement the frameworks or models that have been developed.

Regarding the case- and cross-sectional studies, many that have been published tend to be plagued by methodological problems. The more rigorous research of this type tends to be less anecdotal, narrower in focus, based on fewer or individual cases, and is consequently limited in impact or contributions. But though case studies are often illuminating, interesting, and enjoyable reading that offer insights into managerial decision-making and the effective practice of strategic management, they are frequently criticized as nonscientific by traditional standards (Bullock and Tubbs, 1987). In fact, Campbell and Stanley (1966:6) have argued that case studies "have such a total absence of control as to be of no scientific value." This indictment is based on the premise that nothing can be learned from an n of 1. Though generalizability from a single case study is questionable, the research design nonetheless does have some merit, especially when it is complemented by other methodological techniques and when findings are replicated across several case studies over

time. What the cases painfully highlight, though, is the fact that practice is rapidly outpacing theory--much of what may be considered state-of-the-art or innovative in SHRM is originating in the field.

For the purposes of this thesis, three generic research streams or approaches were identified: (1) matching specific HRM practices to business strategy, (2) linking human resource management to business strategy through human resource planning, and (3) conceptual models or frameworks that link HR policies and/or practices at the system level to strategic planning. Admittedly, these categories are not mutually exclusive. There is considerable overlap among them. Again, each has strengths and weaknesses and offers research challenges and opportunities. Though a normative approach for matching specific HRM practices to business strategy is intuitively appealing, it may not offer the flexibility required under conditions of environmental change and uncertainty. More research is needed to better understand the specific conditions under which a normative approach to matching specific HR practices to business strategy might be more effective and the conditions that moderate the relationship.

HR planning also offers opportunities for advancing our knowledge and understanding of SHRM. Rousseau (1988:266) supports this contention:

> Strategic planning increasingly requires links with HRM planning to realize the opportunities that HRM systems provide for creating and sustaining innovation and

> environmental adaptation in organizations. Unless HRM systems play a part in strategy formulation they will become constraints rather than opportunities. The linkage of strategic and human resource planning is fundamental to readiness.

However, as noted earlier, much remains to be learned about the factors that influence an organization's approach to HRP and linkages to strategic business planning. More research is also needed to identify and understand the factors that influence the type of linkage of HRP to strategic planning that might be most appropriate for a firm to consider under specific conditions.

Many of the SHRM frameworks, models and typologies that have appeared in the literature advocate a congruence approach linking HRM to strategic business planning. Though the congruence approach is intuitively appealing, as mentioned above, it is also subject to criticism in that it suggests there is "one best way" that provides ideal results. More longitudinal research needs to be conducted that would allow for empirically testing the various conceptual frameworks and models that have appeared in the literature. Fortunately, this task is eased somewhat in the cases where theoretical propositions have been advanced by authors of some of these SHRM approaches (Miller, 1987; Lengnick-Hall & Lengnick-Hall, 1988). In addition, more systematic evaluation of the role and operation of HRM, its relationship to business strategy, culture, and organizational performance is needed.

Unequivocally, more theoretical development regarding SHRM is needed. One promising method that hasn't received the attention it deserves is the grounded theory approach introduced by Glaser and Strauss (1967). It has been used successfully to generate theory regarding organizational death (Sutton, 1984) and the diffusion of innovation (Burgelman, 1985).

More research is also required at multiple organizational levels. Perhaps the generation of theoretical propositions that link specific characteristics or dimensions associated with the various HRM practices, including HRP, to business strategy and effectiveness would help provide a stable platform from which more rigorous investigations can be conducted.

The longitudinal study reported in this thesis hopes to enhance our comprehension of strategic human resource management and contribute to expanding the foundations of SHRM research by (1) addressing the question of the magnitude and direction of the relationship between strategic human resource management, human resources effectiveness, financial performance, and productivity; (2) drawing from theory, previous research, and an SHRM action research data base and to develop a conceptual model that allows for the empirical testing of the relationships between these variables; (3) conducting correlational and regression analyses on these data at the business unit and individual levels of analyses to examine the linkages in the

model; and (4) reporting these results and their theoretical as well as practical implications.

With these lofty objectives clearly spelled out, I turn next to Chapter Three where the study on which this thesis is based and its specific research methods are described in detail.

CHAPTER THREE

METHODS

I keep six honest serving-men
(They taught me all I knew);
Their names are What and Why and When
And How and Where and Who.

Rudyard Kipling, <u>Just So Stories</u>

Introduction

This chapter presents an overview of both waves of the action research project on which this thesis is based including instrument development, sample selection and data collection processes. As the opportunity to study the relationship between human resources and organizational performance emerged over time, the research methods employed are presented and discussed chronologically. The specific human resources and organizational performance measures comprising the conceptual model that is presented and tested in this thesis are then reviewed. The chapter concludes with a discussion of the analytical methods employed at the two levels of analyses that are the focal point of this research.

Overview of the Study

The initial ECG Productivity and Quality of Work Life proposal outlined seven key objectives, which are presented

in Table 3.1. It also identified and briefly reviewed the components of two conceptual frameworks that could serve as useful tools to facilitate diagnosis and action plan formulation for changes deemed necessary. A third key element of the proposal was the recommendation for the establishment of an ECG management steering committee for productivity and quality of work life.

Subsequent consultations resulted in narrowing the scope of the project to support what Knudson and Holmes viewed as the three primary purposes undergirding SHRM in ECG. These were:

1. Encouraging synergy/integration of the array of HRM activities within ECG, with Bruce Holmes serving as coordinator of the activities,

2. Educating HR staff in the underlying concepts and principles of SHRM and how to implement them in order to better deal with internal and external pressures for change in the organization, and

3. Creating a collaborative spirit between the line and staff so that the line, which ultimately retains responsibility for HRM implementation, could enhance its effectiveness in this area.

The narrower focus meant that the project would involve conducting an assessment of human resource management at the top of Knudson's organization. The manifold productivity and quality of work life initiatives would be examined, debriefed, and integrated in-house by members of Holmes' staff. Following agreement on these objectives, Noel Tichy assembled an action research team comprised of four doctoral

Table 3.1 Initial Project Objectives

[1] To work with ECG management in formulating the strategy for productivity and quality of work life

[2] To provide concepts and strategies for use in developing the management systems, organization design, and human resource management systems for improving productivity and quality of work life

[3] To work with the ECG HR Manager in helping develop ECG's cadre of employee relations staff to be more strategic and to work with them in their effort to make necessary changes in the human resource systems needed to support the productivity and quality of work life efforts

[4] To provide assistance to the Productivity Center in terms of assessment capability, training or consultation

[5] To provide ECG with an appropriate information system to help in guiding and monitoring the productivity and quality of work life efforts. Such a system should be coordinated with the work of other groups in Sterling both in ECG and at Corporate

[6] To provide assessment and evaluation of specific change projects in ECG, such as gainsharing experiments

[7] To provide ECG with an independent, critical perspective that will help in continually examining basic assumptions and approaches to productivity and quality of work life

Source: N. M. Tichy, Project Prospectus: Productivity/Quality of Work Life, Sterling Electronics Component Group, November 23, 1981.

students in ISR's Organizational Psychology program and myself. One of the team's first tasks was to collect archival and secondary source data about ECG to familiarize itself with the company's history, businesses, products and its environment. These data were useful in providing team members with an understanding of the organization's internal and external context and in triggering questions regarding SHRM at ECG.

Concurrently, the team began the task of developing drafts of the survey and interview instruments. Work proceeded in three areas: (1) review, selection and refinement of items from existing questionnaires[1], (2) operationalization of theoretical concepts and frameworks developed from earlier SHRM research conducted by Tichy and his colleagues at Columbia (see Devanna, Tichy, and Fombrun, 1981; Tichy, Fombrun, and Devanna, 1982), and (3) development of ECG-specific questions emerging from a review of the archival and secondary source data as well as published articles about ECG.

In March-April of 1982, Noel Tichy and Bruce Holmes held a series of preliminary meetings with key line and HR staff members to help shape and refine the design of the

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1 Several of the ECG survey items were derived from questionnaires developed to study strategic human resource management practices at Exxon, Citibank, and Pepsi by Tichy and his colleagues at Columbia. A subset of career measures were derived from Schein's (1978) work and a number of attitudinal measures were culled from the Michigan Organizational Assessment Questionnaire developed by Cammann, Fichman, Jenkins, and Klesh (1983).

project. During these sessions, the theoretical SHRM concepts and frameworks and sample survey/interview questions used by Tichy and his colleagues in previous research supplemented by new material incorporated in the initial drafts of the instruments were presented for review and consideration. Based on reactions and comments that were generated, the Michigan action research team made modifications in the survey and interview guide.

A second proposal was then developed that reflected the narrower focus of the project. It also recommended the formation of a "steering committee." Monthly meetings with Knudson and his two key Vice-Presidents--General Managers at the Division level were requested to help guide and ensure the success of the transformation effort. Bruce Holmes then presented the revised proposal to ECG's Executive Committee (comprised of Jon Knudson, his direct reports and General Managers of ECG's Business Units) for review and approval in early April 1982. The Committee agreed to the study and to the proposed design parameters.

Wave 1 Study Design

Following widely accepted principles of OD theory and practice (French and Bell, 1973; Huse and Cummings, 1985), there was substantial client involvement in the design of the study. This point warrants some clarification. Though Jon Knudson, ECG's Executive Vice-President, was the primary "client," Bruce Holmes, his VP-HR was assigned the role of Project Manager at ECG's end and thus represented both

Knudson's and the HR function's interests. Ably assisted by one of his key direct reports who held a Ph.d. degree in Psychology, Holmes worked with the ISR action research team in shaping the design of the study. This activity included developing the instruments used, i.e., helping to operationalize SHRM theoretical concepts and tailor questions to "fit" with ECG's culture, as well as providing guidance for other aspects of the project. The collaborative arrangement extended to the point where Holmes and his assistant also participated in data collection activities. They ultimately conducted about 10 percent of the field interviews.

Directors/Managers of Human Resources for each of the Business Units also had some say in project design and instrument development. As mentioned above, Tichy, Holmes and his assistant held a meeting with this group (hereafter referred to as the HR Council) in early March to capture their reactions and input into the design of the project and instrumentation. They were briefed and consulted as events unfolded and changes occurred at various phases of the project.

<u>Wave 1 Survey Development</u>. As indicated, a number of items in the questionnaire that was developed to evaluate strategic and operational human resource management in ECG were derived from existing instruments. An additional series of contextual, human resources, and cultural variables were added to the survey. Efforts were made to

tailor specific questions to ECG's culture and assess the linkage between specific strategic human resource management practices and organizational/HR goals identified by Knudson and Holmes. The topics addressed in the questionnaire were organized into the following seven sections:

Part 1: The Nature of the Environment Within Which Employee Relations Operates

Part 2: Who Influences the Mission and Strategy of Employee Relations

Part 3: The Performance of Employee Relations Overall in ECG

Part 4: Human Resource Issues Related to Strategy Formulation and Implementation at the Business Unit Level

Part 5: The Performance of Employee Relations at the Business Unit Level

Part 6: Employee Relations Activities at the Business Unit Level

Part 7: Career Development Activities and Attitudes About Work

Wave 1 Interview Guide Development. Both the ISR team and the ECG Project Manager recognized early on that collecting qualitative data would accomplish several important objectives. First, interview data supplementing the survey results would allow for triangulation--not only enriching the quantitative data and enhancing comprehension, but also increasing internal validity (Jick, 1979). Second, the interview process could also serve as an educational vehicle to introduce SHRM concepts that would probably be difficult to convey in a standard paper-and-pencil questionnaire.

As such, the interview process was an "intervention" as it not only introduced SHRM concepts to ECG managers, it also stimulated them to think about how strategic and operational level HRM practices were formulated and implemented and what their role was in effectively delivering them. It also prompted them to think about a host of other HR-related issues such as what the mission, strategy and role of the HR function should be, the current versus desired culture of their Business Units, and personal career development activities.

Consequently, the design of the study incorporated two-hour interviews with each of the managers comprising ECG's top three management levels. The topic areas complemented much of the material covered in the questionnaire, but also included questions pertaining to the two conceptual frameworks around which the study was oriented. The first framework was a nine-cell matrix developed by Noel Tichy to examine the relationship between three organizational systems (technical, political, and cultural), their "fit," and amount of change required for the organization under study to be successful five years into the future. The second involved the cycle of HR activity within their organizations and was comprised of four key practices-- selection, appraisals, rewards, training, development and career development. The premise underlying this conceptual framework is that higher levels of human resources performance and effectiveness are likely to be achieved if

the four key HR practices are effective, mutually supportive of one another and integrated at strategic, managerial, and operational levels of activity.

The interview guide was organized into six sections:

Section I: Strategic Technical, Political, and Cultural Change in ECG in the 1980s

Section II: The Strategic Role of Your ECG Management Team

Section III: Operational Level HR Cycle Activities

Section IV: Managerial Level HR Activities

Section V: Strategic HR Cycle Activities

Section VI: Organization of Human Resources

Section IV.A: Strategic Activities--How Individual Managers are Personally Affected by the HRM System

Section VI.B: Career Transition--How the HR System Affected the ECG Manager's Last Career Transition

Section VI.C: Career Transition--How The Process Unfolded and Other Key Issues

Wave 1 Study Participants

Research Sites. Given that the project now focused largely on assessing the delivery and effectiveness of HR practices/services, information was sought from the primary users of these practices/services. It was decided to exclude international operations from the study as they were not primary clients of ECG Human Resources and consequently were not primary users of these services. ECG's domestic operations, though headquartered in the mid-west, are located regionally on the east coast, west coast, and in the

southwest. All Business Units were surveyed, and several upper level managers within larger operations comprising the Business Units also participated in the study.

Hierarchical Level. The instruments developed contained questions about the perceived linkages between human resources and business strategy and HR practices used to facilitate strategy implementation. Due to the study's focus, the survey population was limited to those within the organization who were (or should have been) familiar with their business unit's strategic direction and orientation. Thus, the sample for both waves of data collection consisted of managers occupying positions within ECG's top three levels of management. In terms of ECG's chain of command, the survey population was comprised of ECG's Executive Vice-President down through and including the Director level of management.

More specifically, Level 1 was comprised of Jon Knudson and his direct reports. Included in this category were Vice-Presidents for the functional areas of Marketing, Science and Technology, Finance, and Human Resources along with the VP-GMs for ECG's two Groups and two Business Units reporting to Knudson. Level 2 was comprised of Level 1's direct reports, and included a mix of Vice-President-General Managers for the remaining ECG Business Units, Operations Managers, and Directors for specific functions at the Business Unit and Operations levels. Level 3 was comprised of Level 2's direct reports and included Directors and

Managers of various functional areas and programs. Demographic information for participants in both waves is provided in Table 3.2.

Wave 1 Data Collection Procedures

Once consensus was reached by the ISR and ECG teams regarding final drafts of the survey and interview instruments, the Wave 1 data collection process then began. First, interviews with Knudson and his Division-level VPs were jointly conducted by Noel Tichy and Bruce Holmes in late May-early June 1982. As these individuals comprised the Steering Committee, it was essential that they were interviewed first as their involvement would symbolize the importance of the project and provide top-down communication and endorsement.

Holmes and his assistant were also interviewed at this stage and subsequently interviewed a few Level 1 managers. Following an interview, each respondent was left the questionnaire to be completed and mailed to ISR at the University of Michigan.

These sessions were taped, then later transcribed and input into the computerized data base that was being developed for the project. Copies of the transcripts were circulated among research team members for evaluation. The debriefing revealed that some of the questions pertaining to the SHRM conceptual frameworks were difficult to comprehend. These questions were refined and better "prompts" were developed to clarify what was being asked. Also, it was

Table 3.2   ECG Demographic Information

	1982: N	%TOTAL	1985: N	%TOTAL
1. LEVEL				
Level 1	$10/10^{2}$	9.1	8/10	5.5
Level 2	34/35	30.9	48/51	32.9
Level 3	66/76	60.0	90/115	61.6
TOTAL	110/121	100.0%	146/176	100.0%
2. AGE				
Mean	47.86yrs		49.06yrs	
Range	31-65yrs		31-62yrs	
3. SEX				
Male	112	97.4	139	95.2
Female	3	2.6	7	4.8
4. TENURE[3]				
Mean	18.13yrs		19.68yrs	
Range	0-36yrs		0-37yrs	
5. DEPARTMENT				
HR	15	13.0	15	10.3
Non-HR	100	87.0	131	89.7
6. LOCATION				
BU-1	7	6.1	4	2.7
BU-2	12	10.4	7	4.8
BU-3	12	10.4	22	15.1
BU-4	9	7.8	15	10.3
BU-5	5	4.3	12	8.2
BU-6[4]	–	–	5	3.4
BU-7	6	5.2	8	5.5
BU-8	3	2.6	9	6.2
BU-9	5	4.3	20	13.7
BU-10	3	2.6	6	4.1
BU-11	6	5.2	4	2.7
ECG Staff	47	40.8	34	23.3
TOTAL	115	100.0%	146	100.0%
7. RESPONSE RATE				
Surveys	110/121	90.1%	146/176	83.0%
Interviews	115/121	95.0%	53/54	98.0%

2 The first number refers to the number of surveys returned,
the second refers to the total distributed.
3 Compiled from data collected from respondents completing
the demographics section of the survey.
4 Acquired following the 1982 study.

found that it wasn't always clear what organizational level was the proper focal point for some of the questions in the interview guide--especially for respondents in staff positions. Appropriate corrections were made and examples were provided to resolve this ambiguity.

As a precaution, surveys completed by the initial round of participants and open-ended responses they provided were evaluated. The review indicated that there were no systematic problems that required attention.

Following these refinements, an interview schedule was developed with the target date for completion of data collection activities set for the end of July. Interview assignments were then allocated among the ISR research team members and the ECG team. The schedule also made provisions for a "mid-point" status report session with Holmes and his assistant in mid-July to review preliminary findings.

The month of August was devoted to wrapping up loose ends on data collection and completing file building activities. These included following up on surveys not turned in and rescheduling interviews with managers missed due to vacations, unexpected changes in work schedules, etc. Overall feedback reports were scheduled for development in September with site reports prepared the following month. Site feedback and action plan generation were scheduled for completion by January 1983. Interventions evolving from the feedback process and action planning activities were to be implemented during the first half of 1983.

Notification of the study was issued from Knudson's office to the sample population a few weeks prior to commencing the Level 2 and 3 interviews. The memo briefly described the purpose of the project and though stressing that participation in completing the questionnaire and/or interview was strictly voluntary, strongly encouraged employee involvement. Then the ISR research team and Holmes and his staff assistant began the Level 2 and 3 interviews.

For each site, interviews with all participants were scheduled over a one or two day period. Where there were sufficient numbers of respondents per site, ISR team members were paired to facilitate the process. Upon arriving at the site, the members of the research team spent two hours one-on-one with each study participant. During the session, the research team members again described the purpose and nature of the study. Each respondent was then asked if it would be permissible to record the session. It was explained that recording would accurately capture responses to the interview questions and would also unencumber the interviewer from the task of trying to write complete responses while managing the session. Respondents were assured that the recordings would be confidential as would their individual responses to the interview and survey questions, that no one in ECG would have access to them, and that if they wished to speak "off the record" at any point during the interview, the recorder would be turned off. One-hundred and twelve of the 115 interviewees permitted

recording of the sessions. The tapes were later transcribed and copied into a data file for subsequent content analysis, coding, and aggregation for inclusion in various sections of the feedback reports.

The interviews were intentionally semi-structured. Research team members were encouraged to probe and follow up on potentially useful lines of discussion to allow for more in-depth exploration of SHRM and related issues in ECG. At the end of the interviews, each respondent received a copy of the questionnaire to be completed and mailed to ISR in the addressed and stamped envelope that was provided.

Unobtrusive Data Sources. Beyond the survey and interview data, efforts were made to collect unobtrusive data throughout the project. Internally generated documents such as annual reports, personnel policies, company newsletters and brochures were routinely requested and collected. These were supplemented by articles published in the business media about the organization and its industry. In addition, research team members took advantage of opportunities provided by informal interactions and conversations with ECG employees through site visits, meals, telephone communications, and on occasions when an ECG employee at a site provided transportation to and from the airport for a research team member.

Wave 2 (1985) Background

Knudson had tacitly agreed to the follow-up study prior to the launching of the 1982 action research project. He

was convinced that significant change in HR capability, strategic orientation and performance would require several years and that it would be useful to measure progress against base-line data. In addition, the organization had recently undergone major restructuring, largely driven by the rapid growth in its markets impacted by the Reagan administration defense build-up. Thus, the timing for the follow-up study was viewed as appropriate.

Four primary objectives were detailed in the proposal. Briefly, the purpose of the follow-up study was:

1. To assess HRM effectiveness in ECG at the Organizational, Group, and Business Unit Levels,

2. To help ECG Human Resources evaluate progress to date and trends evolving from the 1982 diagnosis,

3. To more specifically examine the culture of ECG and its Business Units as potential levers for orchestrating change that may be deemed necessary over time, and

4. To help ECG Human Resources plan future changes in the HR and organizational culture areas.

The clients for Wave 2, however, would be the Co-Directors of Human Resources who replaced Bruce Holmes (Arthur Knox and John L'Heureux) and members of the HR Council rather than Knudson. As the study's primary clients, Knox, L'Heureux and the HR Council members would receive an assessment of the progress that had been made toward strategic HRM and an overall evaluation of HR effectiveness. In return, I would be allowed to use the data for research purposes, including this thesis.

As Project Manager for the follow-up study, I was assigned two members of Group HR Staff who reported to the Co-Directors of Human Resources to work with. These two individuals coordinated project activities and contributed suggestions regarding the modification of the Wave 1 survey and interview instruments. They were also an excellent source of information regarding the many internal changes that had occurred in ECG since Wave 1. The collaborative arrangement, in this respect, was similar to that experienced working with Holmes and his staff assistant in the original study.

Once preliminary drafts of the instruments had been completed, I was asked to attend the next quarterly meeting of the HR Council in April 1985 in Washington D.C. My task was to explain the objectives and initial design of the study to Council members, address questions and concerns, and to solicit their input and involvement. All members of the Council received copies of the proposal and instrumentation prior to the session.

During the meeting, three specific concerns were raised. Some Council members expressed dissatisfaction with how the interviews were arranged and conducted in Wave 1. There was also a general consensus that the feedback process could have been managed much better than it was. They were particularly bothered by the fact that the data were presented first to Knudson without their involvement in determining what he was to see and when. Several Council

members felt the data were perceived as the "HR report card" by senior ECG management. Those whose functions had not been rated very high weren't pleased with the implications and/or repercussions. Third, concerns were raised about the length of the questionnaire. Many felt that at 18 pages, the Wave 1 survey was simply too long. They argued that it contributed to reinforcing the negative image some line respondents had of ECG Human Resources as "paper pushers."

Addressing the concerns of the Co-Directors and the HR Council members was imperative as the follow-up study would not proceed without their approval. My response was to contract with them to conduct all of the interviews by myself, to allow them as clients to control the feedback process and ultimate dissemination of project findings within ECG, and to jointly modify the Wave 1 survey and interview instruments with my Group HR staff contacts as their representatives. Commencement of data collection activities would be contingent on their final approval of the proposed survey and interview instrumentation.

Following the meeting, my Group HR Staff contacts and I debated what would constitute an appropriate length for the survey. A 10-page limit was agreed to, even though some controversy is apparent in the literature regarding length parameters. For example, Dillman (1978) argued that surveys greater than ten pages in length are more prone to response rate problems. However, Baumgartner and Heberlein (1984) argued that length has but a modest negative effect on

response rate which can be overcome if methods such as follow-up calls, incentives, or subsequent interviews are employed.

Adhering to the 10-page parameter meant that new indices I had hoped to add would have to be excluded. For example, several scales derived from Quinn and Cameron's (1983) work on competing values were eliminated. Finally, at the end of June 1985, following two more rounds of consolidation and refinement, the questionnaire was approved. The version of interview guide that was accepted incorporated several ECG-generated questions and was designed to be completed within the two hours allowed for the process.

In early July, plans were completed for the coordination and management of the data collection process. Due to tight budgetary constraints (the budget was less than one-third that of the 1982 study), the scope of the study was necessarily limited, meaning that fewer ECG managers would be interviewed. Partly for this reason and because of concerns raised by Council members, the data collection activities were managed and conducted by myself with coordination for sample selection and scheduling provided by my two ECG Group HR Staff contacts. The timetable for the study was as follows: (1) questionnaires were mailed to respondents in August 1985; (2) interviews were conducted during August and September 1985; (3) a preliminary report was prepared for presentation to the Co-Directors of ECG

Human Resources in mid-October 1985; and (4) the final report for each Business Unit was completed and distributed to members of the HR Council during their meeting on November 21, 1985.

Wave 2 Study Participants

It was decided that the study population would be the top three levels of management within ECG for the same reasons this population was surveyed in 1982. However, in the three years that had passed since Wave 1, the organization had experienced substantial growth. Structurally, the organization had been reorganized into two large groups, each of which was comprised of four Business Units. The 1985 organization chart is illustrated in Figure 3.1. Consequently, there were many additions to the top three levels of management though as a result of decentralization initiatives, there were fewer ECG and Group-level staff members.

Given the significant increase in managers at the top three levels, it was decided that the follow-up study would involve surveying and interviewing all Level 1 and 2 managers, whereas only a subsection of Level 3 managers-- "key direct reports" to Level 2 managers--would be surveyed. These were defined as "those department heads who have substantial management responsibility and, as such, significant involvement with Human Resources within their Business Unit."[5] The characteristics of the final sample

5 Memo from ECG's Co-Directors of HR to members of the HR

are displayed in Table 3.2. Though efforts were made to include as many respondents as possible from Wave 1, several were no longer with ECG. Some had retired, and the remainder had either transferred to new positions within other Sterling operations or had left the company for new positions elsewhere. Seventy-five of the 176 managers (42.6%) who comprised the Wave 2 survey population were part of the 1982 study population. The percentage of those completing the surveys, or "matched cases," was also 43%.

Wave 2 Data Collection Procedure

Understandably, Knudson and his two Group VPs were briefed on the project as it evolved by the two Co-Directors of Human Resources reporting to them. Knudson's direct reports and General Managers for each of the Business Units were officially notified by a letter in late May 1985 from the Co-Directors of Human Resources that announced the survey, explained the purpose of the study, and described the general process. The remaining Level 2 and 3 managers selected for participation in the study received a similar letter describing the study, its objectives and general process in mid-July, approximately two weeks prior to receiving a copy of the survey in the mail from me about August 1st. The letter noted that participation in the follow-up study was voluntary, though each manager was encouraged to participate. In addition, the mailed survey was prefaced with a cover letter that also identified the

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Council, May 22, 1985.

Figure 3.1   1985 ECG Organizational Chart
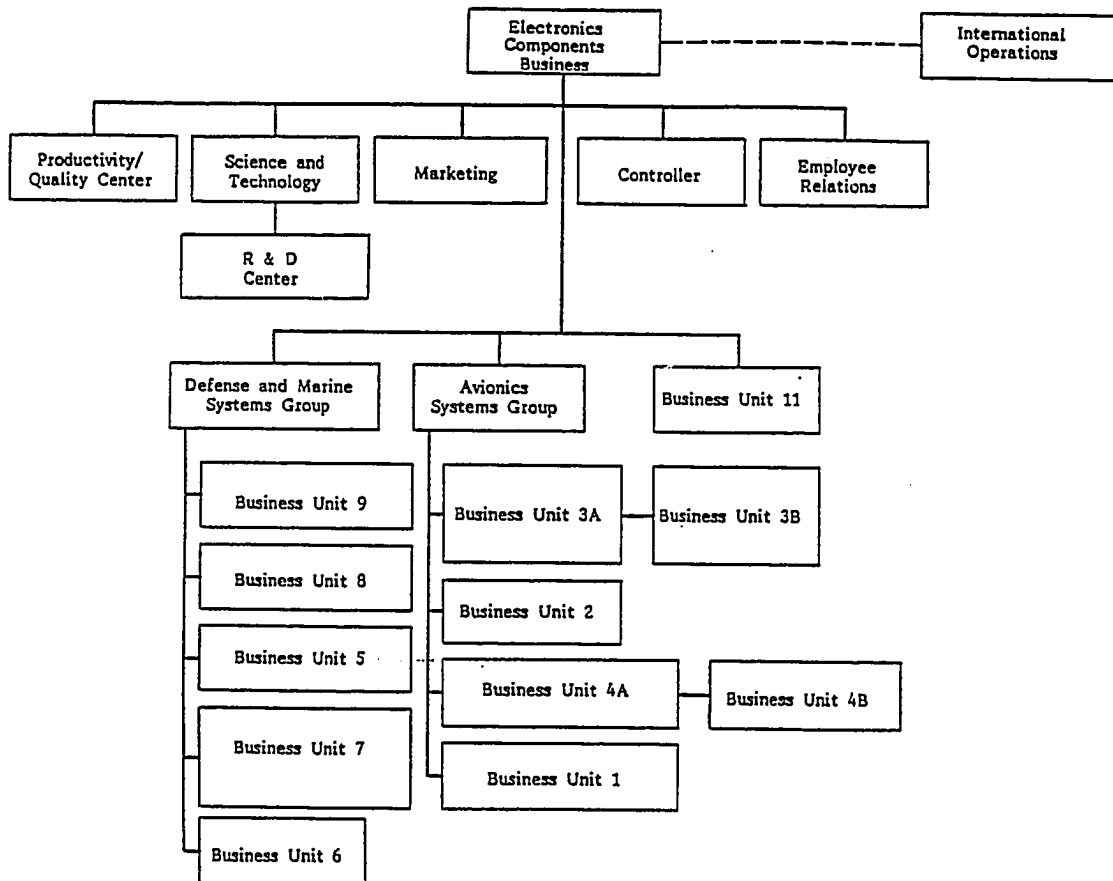
purpose of the study and stressed that participation was voluntary. A return envelope was enclosed for direct mailing of the survey to the University of Michigan for processing. Respondents were assured that individual results were confidential and that no one in ECG would have access to individual data.

Consistent with the design of the 1982 study, several methods were used to collect data. These included surveys, interviews, internal documents, secondary source data, popular business press articles about the organization, and informal conversations with study participants. This triangulation of research methodologies (Jick, 1979) afforded the opportunity to enhance our comprehension of operational and strategic human resources performance and effectiveness across time and the magnitude and direction of change. Furthermore, documenting the case study in this manner provided for a better understanding of important context, content, and process issues that are often neglected in studies of change (Pettigrew, 1985). Examining these issues concurrently not only enriches our comprehension of the complex phenomenon of change, it also helps explain variance in the outcomes of the change process (Mohr, 1982).

Wave 2 Questionnaire. Given that a primary objective of the follow-up study was to measure change against baseline data collected in Wave 1, it was essential that key sections of the 1982 survey instrument remain intact.

However, in response to concerns regarding length broached by Council members and to provide for an opportunity to focus on issues of specific practical and academic interest, a number of questions were deleted from the survey. These included the complete section of career transition variables. Several others were added, particularly regarding organizational culture and quality of HR practices. In addition, questions pertaining to the two conceptual frameworks incorporated in the Wave 1 interview guide were moved to the Wave 2 survey. This was to ensure that responses from Level 3 participants regarding strategic change and HR effectiveness would be recorded as these managers would not be interviewed. A copy of the Wave 2 questionnaire is provided in Appendix A.

Wave 2 Interview Guide. For budgetary reasons, only Level 1 and 2 managers were interviewed. During August and September 1985, I conducted two-hour interviews with fifty-three of the fifty-four managers within this population. The topics covered in the interviews largely complemented those in the questionnaire. The interview guide was organized as follows:

Section I: Questions About the Respondent and
              His/Her Job

Section II: Human Resource Management in ECG

Section III: The Role and Organization of the
              HR Department

Section IV: Managing Change in ECG Human Resources

Section V: Human Resources and Strategy Issues

In brief, the first set of questions asked the respondent to describe his/her job, responsibilities, number of direct reports, and so forth. In the second section, several questions were asked that pertained to the strengths/weaknesses of strategic, managerial, and operational HR practices. Questions in the third section focused on the current versus desired role of HR at Business Unit and Group levels and how the function and support mechanisms should be organized. The fourth section was comprised of questions that inquired about context, content and process issues in managing strategic change in ECG Human Resources. The final set of questions referred to the two conceptual frameworks and also addressed specific strategic HRM practices. Again, the interview process was semi-structured to allow for delving into potentially interesting areas triggered by participant responses.

One concession I reluctantly made was to abandon plans to record the sessions. A few Council members made their preferences known that they disliked the use of a tape recorder, felt it was intrusive, and were uncomfortable with having a "voice print" of the session. To appease this faction, none of the sessions were recorded. Instead, I took copious notes during the interviews which I later reviewed and coded myself for aggregation and inclusion into the feedback reports.

Qualitative Data and Measures

The data generated from interviews conducted for Waves 1 and 2 as well as unobtrusive data enriches our comprehension of strategic change in human resource management at ECG and sheds light on how human resources can be used strategically to drive performance. Both major and subtle themes are suggested by these data. Importantly, these data afford the opportunity to evaluate strategic and operational HR performance and effectiveness from the perspective of those who witnessed, experienced and/or contributed to it within the organization.

Though the bulk of the analyses conducted in this thesis will focus on empirically testing the relationship between human resources and organizational performance, the qualitative data stimulated my thinking about specific relationships between variables in the conceptual model that this thesis is based on. In addition, these data were used to supplement the quantitative test of the model and provided another lens through which I could examine its validity.

Specific interview questions asked respondents to evaluate the effectiveness of selection/staffing, performance appraisal, compensation, training and development, and career development practices at strategic, managerial, and operational levels of activity. For the sake of brevity, only those interview questions related to my proposed model will be presented and discussed here.

Respondents were asked to briefly describe how each practice was conducted and to then rate the effectiveness of the practice. In addition, respondents were asked to support or explain their rating. For example, if a respondent rated the effectiveness of selection in driving performance a 3 on a 5-point Likert-type scale (1=not effective, 5=very effective), he/she was asked to explain why the practice received that rating. They were also asked to prioritize two or three specific strategic and operational HR practices that should be targeted for improvement. The specific questions contained in the survey will be presented in my discussion of the model.

The follow-up study intentionally probed more deeply into the strategic orientation of human resource practices than the original study did. Questions were asked whether observable changes had occurred in HR performance, organization and orientation since Wave 1 and what problems might be inhibiting further progress in the area. Respondents were asked to identify specific activities and programs that had been established since Wave 1 to accomplish change and achieve progress in HRM in ECG. They were also asked to rate the overall performance and effectiveness of the HR function that served them or their unit.

Strategy, Financial and Productivity Performance Data

The collection of financial and productivity performance data was not deliberately planned prior to the

launching of Wave 2. During the course of my interview with ECG's controller, one fruitful discussion centered on ECG's performance at the organizational level as well as at the Business Unit level and general comparisons were made to the industry as a whole. We realized that one logical payoff from effective strategic human resource management would be increased organizational performance vis-a-vis attaining strategic objectives. Having longitudinal data would lend itself nicely to exploring this relationship. Best selling trade books in print at the time suggested that effective human resource management makes a difference regarding organizational performance, but little empirical evidence existed.

Once I had completed my contractual obligations for processing the data and feeding it back at organizational, group, and business unit levels, I contacted the controller and arranged for a meeting in early January 1986. My intent was to inquire about the possibility of acquiring strategy, financial and productivity performance variables at the business unit level from 1982 through 1985--the timespan of the project. In my view, the strategy variables represented one of the "missing links" in the process. Though respondents shared with us their perceptions regarding how well human resources strategy and practices were integrated with business strategy, we had no descriptive measures of strategy or strategic direction at the business unit level. I had envisioned developing a model that would allow me to

empirically test contextual, strategy, HR performance and organizational performance relationships sequentially over time. I had also hoped to be able to explore whether specific strategic HRM profiles would emerge or could be developed to complement the various business unit strategic orientations.

The controller's response to my request was encouraging even though for reasons of confidentiality, certain data could not be released. He was, however, able to provide me with several measures of financial and productivity performance for 1982 through year-end 1985.

The controller also directed me to a member of ECG's strategic planning staff to follow up on my request for strategy variables. This individual graciously spent considerable time explaining ECG's recently revamped strategy formulation process to me in personal meetings and telephone conversations over the next six months. He also provided me with the results of the first year's strategy formulation process in the form of business unit strategy variables for 1986. With his consent and blessing, I was allowed to peruse the strategic planning archives for ECG's business units in June 1986. However, my attempts to systematically organize and code these data for the 1982-1985 timeframe on site were futile. After two days of sifting through literally volumes of material at corporate headquarters under time, cost and confidentiality

constraints, I abandoned my efforts to parsimoniously categorize these data.

While in the process of writing the initial chapters of this thesis, I again contacted the controller in the spring of 1988 to follow up on changes within ECG and to request performance data for 1986-1987. It occurred to me that it would be also be useful to study the cross-lagged effects of the 1985 HRM results on subsequent organizational performance and examine emergent trends.

I was briefed on major structural changes recently undertaken to integrate an acquisition Sterling had made into ECG. Again, the controller graciously complied with my request and furnished me with much of the same financial and productivity performance data for 1986-1987 under the condition they be treated as proprietary information. However, close inspection of these data found that they are not directly comparable to the 1982-1985 data and thus could not be used for our current research purposes. Performance results for the acquired business units had been aggregated with the results for the ECG units they had been merged with. As it was not possible to unbundle the performance results for the original ECG business units from overall results at the time of this writing, these data are not included in the model and final analyses.

The Conceptual Model

In Chapters One and Two, the rational for studying the relationship between human resources and organizational

performance as the focal point of this thesis was explained and a review of the literature was presented. The initial research framework and conceptual model were also introduced. Now that the study and the instruments that were employed have been described, attention can be turned to the analytical methods used to develop and test the conceptual model on which this thesis is based.

As is evident, the survey and financial/productivity data allow for the development of a multiple year timeseries design. This opportunity, however, also presents a sizable challenge. Both waves of survey data combined with the 1982-1985 financial and productivity variables sum to several hundred items. The HR performance-organizational performance variables selected for the purposes of this thesis are a small portion of the variables I collected as a result of my involvement with ECG. The objective was to develop a model that was sufficiently detailed to enable empirical examination of the strategic, managerial and operational human resources effectiveness-organizational performance relationship yet was also parsimonious without trading off the quality of predictions yielded. My plan was to develop a stream of research that would build from these findings. A more detailed model incorporating contextual and other variables collected for both waves could then be developed and tested. Thus, for the purpose of this study, a set of 27 items from the 1982 data set and 34 items from the 1985 data set were selected along with the

organizational performance variables for model building and testing purposes.

Figure 3.2 presents the revised version of the model that includes the various indices representing the HR-Strategy Linkage, HR Effectiveness, Financial Performance and Productivity constructs. Methodological procedures used to create these indices will be discussed in Chapter Four.

<u>Measures</u>

Several HR performance variables were included in the ECG Wave 1 and 2 questionnaires. One section of the survey contained questions pertaining to HR functional performance. However, as human resource practices are frequently delivered by line managers, I decided to opt for parsimony at this point and exclude functional performance from the model. Instead, I concentrated on the overall performance and effectiveness of specific practices regardless of who delivered them and those variables that represented a linkage between HR practices and business strategy.

<u>HR Practices-Business Strategy Linkage</u>. One section of the survey for both the 1982 and 1985 questionnaires was comprised of a set of HR practices that can be used to facilitate strategy implementation. Seven variables are common to both questionnaires. Three new variables were added to this section for Wave 2. Table 3.3 presents these variables. Respondents were asked to evaluate the extent to which each practice is used as a tool for implementing strategy and the extent to which each should be used. Only
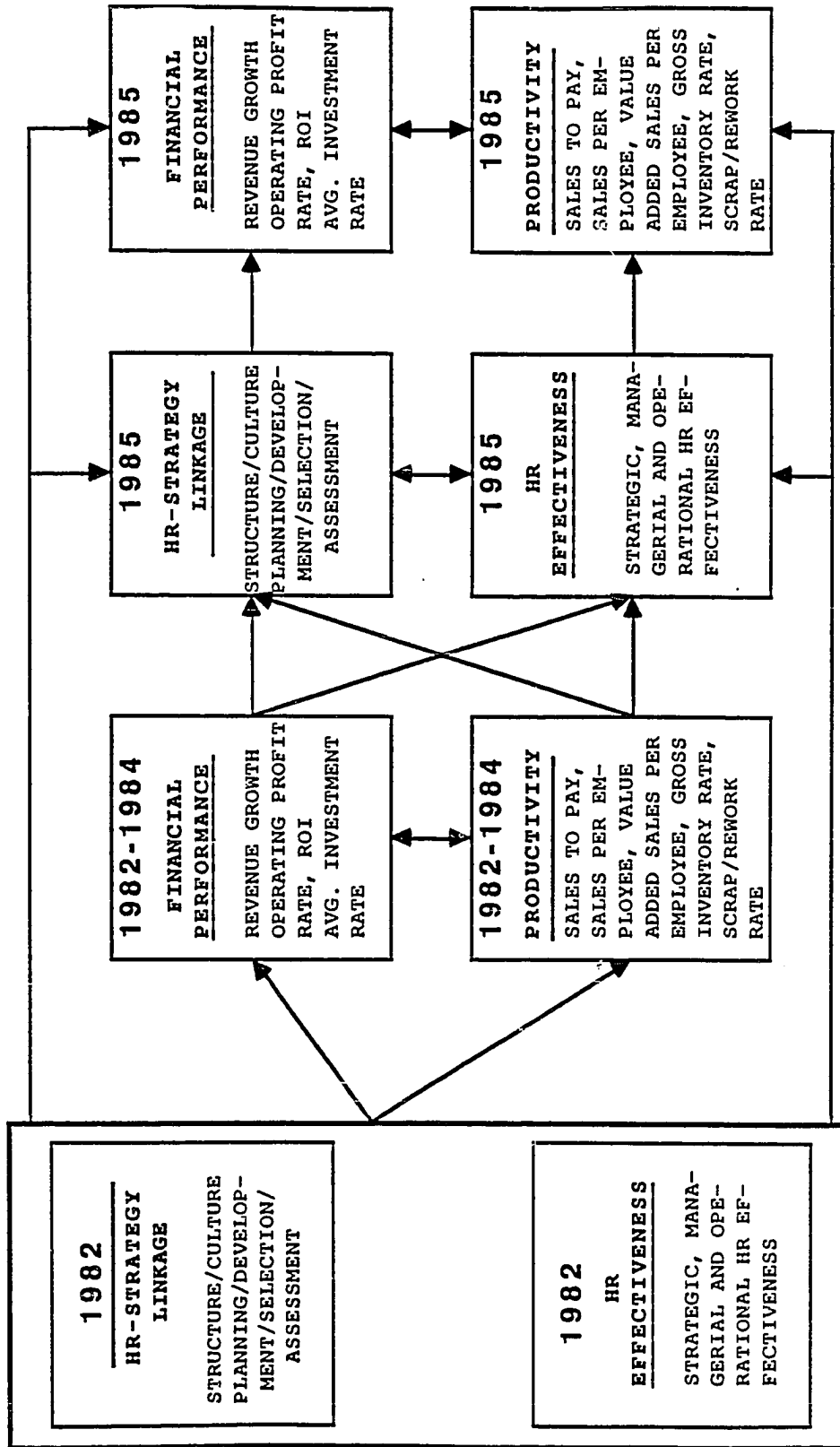
FIGURE 3.2 MODIFIED CONCEPTUAL MODEL OF THE RELATIONSHIP BETWEEN HRM AND ORGANIZATIONAL PERFORMANCE

measures of the current usage of these practices are included in the model. Responses were recorded on a Likert-type 5-point scale (1=little extent, 5=great extent).

Strategic, Managerial, and Operational Human Resources Effectiveness. The second set of HRM variables incorporated in the model includes effectiveness measures for HR practices at strategic, managerial, and operational levels of activity or performance. In brief, the variables are perceptual measures regarding how effective each practice is in driving performance at each level of activity. The effectiveness of the linkages between performance appraisals and rewards as well as training and development were also evaluated. Table 3.4 identifies the eight questions that were asked about each of the linkages in the HR cycle model at strategic, managerial, and operational levels. A 5-point Likert-type scale (1=not effective; 5=very effective) was also used to record participant ratings.

Financial and Productivity Performance Measures. From the data provided by ECG's controller, four financial performance measures and five productivity performance measures for 1982 through 1985 were considered appropriate for inclusion in the conceptual model. These measures are:

FINANCIAL	PRODUCTIVITY
Revenue growth	Sales to pay ratio
Operating profit	Sales per employee ratio
Return on investment	Value-added sales per employee ratio
Average investment rate	Gross inventory rate
	Scrap/rework rate

Table 3.3 HR Practices Used to Facilitate Strategy Implementation

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Below are various human resource management practices which may be used to facilitate strategy implementation. Please indicate 1) the extent to which they <u>are</u> used as tools for implementing strategy in ECG and 2) the extent to which they <u>should</u> be used:

V537:[6] Matching key managers to strategic goals

V539: Identifying the necessary managerial characteristics needed to meet strategic goals

V541: Modifying reward systems (financial and nonfinancial) to motivate managers to attain goals

V543: Assessing the potential of managers for attaining strategic goals

V545: Conducting management development programs to support strategic goals

V547: Establishing career planning processes to help develop managerial talent

V549:[7] Changing ECG's culture to fit strategic goals

V551: Modifying organizational structure to fit strategic goals

V553: Changing internal staffing patterns to help implement new strategies

V555: Succession plans for top three levels of company management

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6 This is the key punch number which also is the variable number for the questionnaire item. This set of variables is located on page 8 in the survey provided in Appendix A.
7 Variables 549, 551, and 555 were not included in the 1982 survey.

Table 3.4   Strategic, Managerial, and Operational Level Effectiveness

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These questions ask about human resource management practices within ECG at the strategic, managerial, and operational levels of activity:

V557-559:   How effective is ECG's staffing/selection process in assuring that people are properly placed in positions to carry out..

    a. strategic level activities
    b. managerial level activities
    c. operational level activities[8]

V560-562:   How effective are ECG's performance appraisal systems in accurately assessing performance of...

V563-565:   How effective are rewards (financial and nonfinancial) in motivating people to work hard in ECG on...

V566-568:   How effective are ECG's training and development practices in motivating performance for...

V569-571:   How effective are ECG's performance appraisal systems in differentiating levels of performance to allow justification of reward allocations for...

V572-574:   How effective are ECG's training and development practices in preparing people for placement into new positions requiring performance of...

V575-577:   How effective are ECG's training and development practices in preparing people placement into new positions requiring performance of...

V578-580:   Overall, how effectively are the human resource components integrated and mutually supportive of...

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[8] The question was repeated for each of the three levels of activity. The last four questions in this set were not asked about Managerial level activity in 1982. This section is located on Page 10 of the questionnaire provided in Appendix A.

The financial performance and productivity indicators are appropriate for the purposes of this study because they are direct measures of short- and medium-term organizational functioning. They also closely operationalize an organization's efficiency in garnering resources from its environment (Denison, 1982).

Unfortunately, other key ECG financial performance measures such as Return on Assets, Return on Capital or Return on Equity were not available for this study. These measures tend to be less susceptible to annual fluctuations than are ROI and Operating Profit Rate and thus are more stable long-term performance indicators.

Monitoring Progress in ECG Strategic Human Resource Management

The preliminary conceptual model that was constructed and the research propositions that were advanced in Chapter One are based on the premise that the action research project did effect change in ECG human resource management from Wave 1 to Wave 2. Though this is not an evaluation study, which would be an entire dissertation in and of itself, it is nonetheless important to glean an understanding of whether or not progress in strategic human resource management and effectiveness was made from 1982 to 1985. According to the model and propositions advanced, it is expected that the cross-sectional relationships of 1985 HRM to organizational performance will be stronger than those observed for the 1982 HRM variables. It was also

proposed that the relationships of the 1982 HRM variables to 1983-1985 performance would be greater than the effects of the 1982-1984 performance variables on the 1985 HRM variables.

Important questions to consider include what was the original pre-intervention state of human resources management like? What interventions were formulated to guide the change toward the desired state? And what changed? Both the qualitative and survey data will be mined to generate appropriate responses to these questions.

Wave 1 Action Research Study Findings

As discussed in Chapter One, ECG was experiencing a stage of rapid growth in the early to mid-1980s, largely fueled by the Reagan Administration defense buildup. However, the organization was not immune to a host of problems in its technical, political, and cultural systems, many of which were triggered by the munificent opportunities confronting several of its business operations. Collectively, these problems had implications for changes in mission and strategy, organizational structure, and human resource management that would be required for ECG to achieve its strategic objectives.

A diagnostic tool developed by Tichy (1981) was used to examine the state of ECG's technical, political, and cultural systems in 1982 and 1985. TPC theory is based on the contingency premise--organizations are likely to be more effective if there is a good "fit" between the three

systems. Tools managers have at their disposal to facilitate the alignment of the systems include Mission and Strategy, Organizational Structure, and Human Resource Management.

Table 3.5 illustrates the Organizational Matrix, which represents the operationalization of these concepts, and mean scores for various categories of survey respondents. These include overall, matched group, line, and staff (HR). Briefly, respondents were asked to evaluate the amount of change required in each of the nine cells of the matrix at the organizational level for ECG to be successful over the next five years. In view of the objectives of this research, the column in the matrix of particular interest, of course, is Human Resource Management.

The results are telling of internal strengths and weaknesses within ECG in 1982 and 1985 (mean scores with an asterisk are significant at the .05 level or greater). For example, the cultural system variables and the human resource management variables (the reversed "L" in the matrix) were perceived by respondents to require the greatest amount of change in 1982. The other area warranting more than moderate attention was defining ECG's mission and strategy.

However, as the mean scores presented in Table 3.5 indicate, significant positive changes did occur in two of the three HR variables: (1) technical system-human resource management (developing new methods for staffing, training,

Table 3.5 The Organizational Matrix: 1982 and 1985 Results

For each of the following elements in the matrix, respondents were asked to rate the amount of change that would be required for ECG to be successful over the next 5 years.

	Mission & Strategy		Organizational Structure		Human Resource Management	

Technical

■ DEFINING WHAT BUSINESS(ES) WE ARE IN AND DETERMINING ECG'S BUSINESS STRATEGY

	1982	1985
OVERALL	3.4	3.6*
MATCH	3.3	3.4
LINE	3.4	3.6
STAFF	3.1	3.6

■ DESIGNING AN ORGANIZATION STRUCTURE (DEFINING REPORTING RELATIONSHIPS) TO MEET ECG'S BUSINESS NEEDS

	1982	1985
OVERALL	3.1	3.3
MATCH	3.0	3.1
LINE	3.2	3.2
STAFF	3.0	3.5

■ DEVELOPING NEW METHODS FOR STAFFING, TRAINING, AND DEVELOPING HUMAN RESOURCES TO SUPPORT ECG'S BUSINESS NEEDS

	1982	1985
OVERALL	3.6	3.4*
MATCH	3.7	3.3
LINE	3.6	3.4
STAFF	3.5	3.5

Political

■ DEFINING WHO GETS TO INFLUENCE THE MISSION AND STRATEGY OF ECG

	1982	1985
OVERALL	2.9	3.4*
MATCH	2.9	3.2
LINE	2.9	3.3
STAFF	3.1	3.5

■ REDISTRIBUTING POWER OR INFLUENCE BOTH ACROSS AND UP AND DOWN THE ORGANIZATION TO MEET ECG'S BUSINESS NEEDS

	1982	1985
OVERALL	3.1	3.3*
MATCH	3.0	3.4
LINE	3.0	3.3
STAFF	3.3	3.5

■ MANAGING THE POLITICS OF SUCCESSION, APPRAISALS, AND REWARD SYSTEMS FOR ECG TO BE SUCCESSFUL

	1982	1985
OVERALL	3.4	3.5
MATCH	3.4	3.4
LINE	3.4	3.4
STAFF	3.7	3.5

Cultural

■ DEVELOPING A CULTURE, OR SET OF VALUES, TO SUPPORT ECG'S BUSINESS STRATEGY

	1982	1985
OVERALL	3.3	3.3
MATCH	3.2	3.1
LINE	3.2	3.3
STAFF	3.6	3.1

■ DEVELOPING A MANAGEMENT STYLE OR CULTURE TO MEET ECG'S BUSINESS NEEDS

	1982	1985
OVERALL	3.6	3.5
MATCH	3.5	3.5
LINE	3.5	3.5
STAFF	4.0	3.2*

■ SELECTION AND DEVELOPMENT OF HUMAN RESOURCES PRACTICES AND SYSTEMS TO SUPPORT ECG'S CULTURE

	1982	1985
OVERALL	3.6	3.1*
MATCH	3.6	3.1
LINE	3.6	3.0
STAFF	4.0	3.3

KEY:

1	2	3	4	5
Little change				Great Deal of Change

*Statistically significant

and developing human resources to support ECG's business needs); and (2) cultural system-human resource management (selection and development of human resources practices and systems to support ECG's culture). HR staff members, too, indicated that significant changes had occurred in management style or culture to meet ECG's business needs, though the responses for the line participants didn't change from 1982 to 1985.

The results of the Match category (matched cases, or respondents who participated in both the Wave 1 and Wave 2 studies) are the most relevant for the purposes of this research. Statistically significant improvements in the amount of change required to develop new methods for staffing, training, and developing human resources to support business needs were recorded for this group. The data also reveal significant improvements in the selection and development of human resources practices and systems to support culture.

In addition, the 1982 survey data represent pre-intervention baseline data. Though principles and concepts of strategic HRM were introduced to the study participants through the survey and interview sessions, the series of interventions formulated and implemented to enhance strategic human resource management and strategic, managerial, and operational HR effectiveness occurred after the Wave 1 data had been collected and analyzed.

Table 3.6 provides a brief summary of key findings and challenges emerging from the initial study. Despite the rapid growth in revenue and business opportunities, the pre-intervention Wave 1 data indicate that little in the way of strategic human resource management was being formally practiced in the organization in 1982.

Though some of these data are specific to the performance of the HR function, the project was targeted to improving overall human resource management within ECG, not specifically the HR department or function. The project did, however, surface design or structural issues pertaining to the HR function and the specific role it should be playing at various organizational levels.

A second important observation pertains to the lack of formal integration of human resources into strategic business planning. Part of this appears to be a function of the administrative, or operational role the HR function was playing--HR Directors, in general, were not considered to be active, contributing business team members in most of the business units in 1982. This indicates that largely an administrative rather than strategic approach to managing human resources within the organization was being practiced.

Interventions

Several interventions designed to improve HR effectiveness and enhance strategic HR capability were implemented following the 1982 study, a number of which are identified here. First, a major reorganization was

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Table 3.6   Summary of 1982 ECG Human Resources Study:
Key Findings and Challenges[9]

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1. A need to facilitate better alignment of the technical, political and cultural organizational systems to drive and support business strategy

2. Evidence of a need to upgrade the quality of HR services/practices

3. A need to improve the image of HR and its working relationship with the line

4. Human Resources is functioning largely in an operational role, with little to no involvement in strategic business planning or activities

5. Strong evidence of a need to improve business strategic planning through the inclusion of human resources considerations

6. A need to focus on HR activities as a way of implementing business strategies

7. A need for improvement in HR contributions as an active business partner

8. A need to strengthen the training and development opportunities for human resources staff

9. A lack of clarity about the role of Group Human Resources, with the understanding that Group HR could spearhead strategic change and provide leadership to the function

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undertaken in 1983 which had important implications for human resources management in ECG. Major changes were made in the strategic planning process to include HR content issues. The role of HR was also enlarged to involve its participation in the process. A series of strategic planning workshops were conducted that included both line and HR participation. The High Talent Review process was

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9 Derived from ECG Wave 1 Feedback Report.

changed into a strategic human resource review process where managers were held responsible for planning and implementing developmental activities for all key positions and people tied to strategic business planning. Changes were made in HR systems, policies and practices, too, to select, appraise, reward, train and develop, and promote employees at strategic, managerial, and operational levels of activity. The HR function was empowered to serve as a strategic business team partner, a level of status similar to that enjoyed by Finance and Marketing in the company.

Bruce Holmes outlined related changes in ECG human resource management that had been implemented following the 1982 study:

> In the areas of human resource planning, we made some decided improvements in terms of tying it to business planning. In 1983, every human resource professional executive in ECG worked with his/her general management staff and business planners to develop the business plan, and HR issues contained in the strategic human resource plan were tied into the business plan. This is the first time all of the HR professionals engaged in this process, though different ones at different stages of their development with different general managers have been involved. So this was the first time it was formally done with every single one sitting in and a plan developed so that the human resources strategy could be linked to the business plan.
>
> Second, a follow-on activity was added, which is the development of an operational human resource plan, much like the business operating plan which dealt with the next year and contained in it those three or four things that each employee relations function along with its line was going to accomplish during that year to further those basic strategies that were brought out in the

previous year's plan. We also developed a calendar that goes in synch with the business plan, which had not been done before.[10]

Contextually, other changes were implemented that had important implications for human resource management at strategic, managerial, and operational levels of performance. Knudson began a series of organizational transformation and cost control initiatives to bolster the performance of the company, which involved the use of HRM practices to help change ECG's culture. For example, ECG had a history of not pulling the plug on "leakers"--projects that went way over budget with little to no chance of recouping losses. The organization's tradition had always been to place quality before cost with little emphasis on trying to achieve both goals simultaneously.

Second, one of the outcomes of ECG's revamped strategic planning initiatives was the analysis of ECG's top twenty competitors in the defense industry along several relevant dimensions, including financial and productivity performance and organizational characteristics. The initial results of the analysis influenced Knudson to launch a stringent asset management program to help the company achieve and sustain competitive advantage.

With a renewed focus on performance and productivity driven by Knudson and reinforced by the organization's HRM systems, some of these efforts began to pay off by 1985. In Knudson's words:

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10 Interview with Bruce Holmes, 1983.

> We gained a 20% increase in revenue from 1982 to 1983, with a 4% increase in headcount-- most of which we believe was attributable to our productivity initiatives. That is, we are doing our work better. Each of us is contributing more per days worked than before. We established a school, a productivity center, and a general principles statement first, and then we continued to communicate to one another on our improvements and practices.

> . . . the overriding strategy is people involvement, getting people involved whether with management or people performing tasks on the shop floor. The Productivity Center furthered that involvement of the people in the development and acceptance of these tools and techniques. The Management Development Center furthered training of mangers both in terms of their functional skills and their people skills. And the Quality Center furthered the quality of worklife initiatives that are an integral part of the productivity and quality initiatives ongoing in ECG.[11]

The company was beginning to develop a reputation as a leader in productivity and quality enhancement. Improvements were recorded in three key areas--less scrap and rework, higher value-added sales per employee, and lower inventories as a percent of revenue. These results influenced the consideration of these measures in the conceptual model developed for this research, a revised version of which will be presented shortly.

Wave 2 Action Research Study Findings

What has been the outcome of these change efforts? Did ECG human resource management truly become more effective? Did the planned changes really occur? A brief review of highlights of the second wave of data collection provides a

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[11] Interview with Jon Knudson, 1983.

snapshot of what changed and the direction of the change.
These results are summarized in Table 3.7. As these key
findings and challenges suggest, the interventions
implemented to transition the human resources function from
an operational orientation to a strategic business partner
contributed to enhancing human resources and organizational
performance. Many of the changes that occurred in human
resources practices and contributions from Wave 1 to Wave 2
are statistically significant.

Though these findings hardly mine the richness of the
qualitative data collected as part of the study, they
support the contention that significant changes had occurred
in ECG strategic human resource management and effectiveness
by 1985. Not discussed were the changes in specific
practices--recruitment, selection, appraisal, compensation,
training and development, .career development, and
promotions, all of which, in ECG overall, experienced minor
to fairly substantial change. With the exception of the
1984 data, strong results were also recorded for financial
performance and productivity during this period.

Unfortunately, space doesn't allow for an explication
of the differences between the business units regarding
strategic human resource management, HR effectiveness and
performance. Case studies of these relationships
supplemented with an assessment of other organizational and
contextual factors would lend themselves nicely to examining
how higher performing organizations differ from lower

**Table 3.7   Summary of 1985 ECG Human Resources Effectiveness
Follow-Up Study: Key Findings and Challenges[12]**

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1. Little to moderate gains in quality of human resources practices. though moderate to high gains in activity and performance

2. High gains in improvement of human resources image and working relationship with the line--a key management team member

3. Moderate to moderately high gains in transitioning to a more strategic role with involvement in strategic business planning activities

4. Moderate gains in utilizing human resources management practices to implement business strategies

5. Moderate to moderately high gains in improvement of human resources contributions as an active business partner

6. High gains in strengthening the training and development opportunities for human resources staff, though there is still a need to raise standards and caliber of selection candidates

7. Little to moderate gains in clarifying the role of Group Human Resources staff

8. Moderate to high gains in openness and communications in ECG's culture, but little to no gains in participative decision-making

9. Moderate to high gains in linking HR planning to strategic business planning

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performing organizations at different phases of the lifecycle along these dimensions. This opportunity serves as an impetus for future research on the relationships between these variables, which will be addressed at the close of Chapter Seven.

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12 Derived from ECG Wave 2 Feedback Report.

In the meantime, the key findings generally reviewed here, in the aggregate, sufficiently undergird the research propositions advanced for this research. The qualitative data will also be used to help explain the nature and direction of the significant relationships between the HRM and performance variables emerging from the correlational and regression analyses in Chapters Five and Six.

Analytical Plan

To facilitate the clarity of the relationships among the constructs in the conceptual model, various analytical procedures are used to reduce the number of items selected and form scales or indices around common elements. The analyses performed on these variables involve two distinct levels: (1) the item level, and (2) the scale, or index level. Each set of analyses is briefly described in this section.

Item Level Analyses. Univariate, bivariate and multivariate analyses were first conducted on the selected variables at the item level. This was to examine the reliability of the items and to create indices for the constructs within the conceptual model. First, descriptive univariate and parametric unidimensional analyses were conducted to examine the frequency distributions for the items. Those with high measures of skewness or kurtosis were either transformed using appropriate statistical procedures or excluded from final analyses.

Second, the Pearson correlations for both waves of data were then examined to determine the strength of the bivariate relationships among the items and check for the presence of multicollinearity. The third step involved exploratory factor analytic methods to determine whether the obtained factors fit the expected factors derived from previous theoretical formulations and to create the indices used for my final analyses.

In summary, the analytical plan that unfolded was to employ this three-step procedure for index construction and to then assess scale reliability and construct validity. Two parameters were adhered to: (1) the indices formed had to be conceptually relevant, and (2) they had to meet both operational and psychometric criteria.

Index Level Analyses. At the scale or index level, univariate, bivariate, and multivariate statistical analyses were also conducted. These include univariate and bivariate analyses within each wave (cross-sectional) and between waves (lagged and cross-lagged). Cronbach's coefficient alpha, a reliability measure, was also calculated for each index.

The multivariate data analytical techniques utilized include cross sectional, cross-lagged, and lagged regression analyses. These analyses were performed to explore the direction and magnitude of the relationships between the constructs, to evaluate the amount of variance in performance accounted for by the indices, and to determine

which are stronger or more significant predictors of performance.

Levels of Analyses

Tests of the model were conducted at two organizational levels of analyses in this research. The business unit level is the initial focal point due the availability of and variability in financial performance, productivity, and HR effectiveness measures. Analyses of variance were first performed to examine the extent to which there were significant differences in survey responses among the eleven business units. Next, correlational analysis was conducted to examine the relationships between the variables in the model at this level. This analytical technique was selected as the method of choice due to the relatively small number of cases or business units (n=11). The results of these analyses are presented and discussed in Chapter Five.

A series of standardized multiple regressions were then conducted at the individual level of analysis to examine the cross-sectional, cross-lagged, and lagged linkages in the model. Understandably, the statistical power of these tests is much greater due to the significant increase in the number of cases at this level which allows for a more rigorous examination of the relationships among the variables. These results are presented and evaluated in Chapter Six.

Summary

This chapter has provided a synopsis of the methods associated with the ECG SHRM action research project on which this thesis is based. Also presented was a revised version of the conceptual model illustrating relationships among the HRM and organizational performance constructs examined in this research. The measures selected that represent the constructs were briefly described. A summary of the qualitative changes in strategic human resource management and HR effectiveness within the organization from 1982-1985 was also provided. The chapter closes with an overview of the analytical procedures used to create the indices and test the model at the business unit and individual level on analyses.

CHAPTER FOUR

UNIVARIATE, BIVARIATE, AND MULTIVARIATE ANALYSES AT THE ITEM LEVEL AND INDEX CONSTRUCTION

Though this be madness,
Yet there is method in 't.

William Shakespeare, <u>Hamlet</u>,
<u>Prince of Denmark</u>

Introduction

This chapter provides a review of methodological procedures followed to operationalize the constructs in the conceptual model presented in Chapter Three.

Item-Level Analyses

Univariate Analyses: Wave 1 Variables

Univariate analyses were computed to evaluate the means, standard deviations, and skewness for the twenty-seven Wave 1 HR-strategy linkage and HR effectiveness items selected for inclusion in the conceptual model. Table B.1, Appendix B provides a summary of these analyses. The results reveal that the distributions for the complete subset of Wave 1 items selected for this research do not violate assumptions of normality. As skewness was not found to be a problem with these data, all of the items were retained for further analyses.

Bivariate Analyses: Wave 1 Variables

Analyses were then conducted to determine the strength of the bivariate relationships by computing Pearson correlation coefficients within each wave (cross-sectional) and between waves (lagged). An examination of the Pearson correlations revealed that multicollinearity ($r > .85$) was not a problem requiring attention as the highest correlation among the survey variables was .75. The lagged correlations also serve as a measure of reliability of the variables over time. Though some instability in these correlations was expected due to measurement error at Wave 1 and Wave 2, there was no evidence of problems with these data.

Factor Analyses

The final set of analyses performed at the item level were exploratory factor analyses. These were conducted on the total set of the twenty-seven Wave 1 variables for data reduction purposes. The analytical procedure was repeated for both the same twenty-seven items and the expanded set of thirty-four items for 1985. Indices were then constructed as they provide better measures for and reveal more dependable results of an underlying theoretical construct.

Exploratory Factor Analysis: Wave 1. As explained in Chapter Three, several survey items chosen for the model building efforts were derived from instruments previously developed to study strategic human resource management in other companies. The seven items representing the HR-strategy linkage index were chosen because of their

inclusion in earlier SHRM studies and their conceptual
relevance. Unfortunately, no information regarding prior
analyses conducted for index formation or construct
validation was available. The remaining twenty HR
effectiveness variables were derived from efforts to
operationalize the Tichy et al. (1981) SHRM conceptual
framework--the cycle of HR activity at strategic,
managerial, and operational levels.

Prior theoretical formulations suggested that the HRM-
Strategy Linkage variables would form one index and the
strategic, managerial, and operational level HR
effectiveness variables would form three separate indices.
To examine whether the obtained factor solution would fit
the expected four factor solution, responses from all three
levels of management were aggregated and subjected to
exploratory factor analytic procedures. The varimax method
of rotation was employed because it maximizes the variance
of the loadings across items within factors so that loadings
tend to become higher for items with high correlations to a
factor and smaller for the remainder. In addition, the
method tends to reapportion the variance among the factors
that emerge so that all become relatively equal in
importance.

For each questionnaire item listed, the factor loadings
are depicted. Following Nunnally (1978), loadings were
noted for specific items on the emergent factors if they are
(1) greater than .30, or (2) theoretically relevant to this

research.   Eigenvalues, percentage of total variance accounted for, and percentage of common variance accounted for are also presented for each factor.   In brief, seven factors emerged from the varimax rotation of the Wave 1 items, which explain 55.8% of the total variance.   These results are illustrated in Table C.1, Appendix C.

Two items had communalities less than .30, which suggested they were candidates for deletion.   One item was managerial level effectiveness of selection/staffing processes, the other was operational level effectiveness of rewards.   At this stage, given their conceptual relevance, it was decided to retain these items for further analyses.

The first factor accounted for 16.8% of the total and 30.1% of the common variance.   The eight strategic level HR effectiveness items loaded strongly on this factor, with loadings ranging from .486 to .905.   All are components of the cycle of HR activity that measure the effectiveness of selection, appraisal, reward, training and development and career development practices as well as specific relationships between the items at the strategic level.   The obtained results match what was hypothesized.

The second factor that emerged accounts for 12.9% of the total and 23.1% of the common variance.   The seven items that load strongly on this factor are the HR practices used to implement business strategy.   These include matching key managers to strategic goals (.840); identifying the necessary managerial characteristics needed to meet

strategic goals (.665); modifying reward systems to motivate managers to attain strategic goals (.402); assessing the potential of managers for attaining strategic goals (.729); conducting management development programs to support strategic goals (.692); establishing career planning processes to help develop managerial talent (.588); and changing internal staffing patterns to help implement new strategies (.581). Collectively, these seven items represent the HR-Strategy Linkage construct in the conceptual model. Again, the composition of the obtained factor matches what was hypothesized.

The composition of the remaining factors, though, deviate from what was expected. Four items load strongly on Factor 3, which accounts for 8.1% of the total and 14.5% of the common variance. These include effectiveness of managerial level training and development (.451); effectiveness of operational level training and development (.721); operational level effectiveness of training and development in preparing employees for future selection (.698); and effectiveness of integration of HR activities at the operational level (.544). The common theme underlying this factor appears to be training and development.

Three of the remaining five operational level items load strongly on Factor 4, which accounts for 6.3% and 11.3% of the total and common variance respectively. These include operational level effectiveness of performance appraisal systems (.586); operational level effectiveness of

the linkage between performance appraisal and reward allocations (.657); and operational level effectiveness of appraisal system-training & development linkage (.469). The common theme here is performance appraisal and its linkages to other HR practices.

The fifth factor is comprised of two items, only one of which has a strong loading. This is operational level effectiveness of selection/staffing, with a loading of .723. The second item is managerial level effectiveness of selection/staffing, with a loading of .275. This factor, with an underlying theme of selection/staffing, accounts for 4.4% of the total and 7.9% of the common variance.

Two items have fairly strong loadings on Factor 6, which accounts for 3.7% and 6.6% of the total and common variance respectively. These include V564, managerial level effectiveness of rewards (.515); and V565, operational level effectiveness of rewards (.385). Clearly, the theme common to both items is rewards.

Factor 7, the final factor, explains 3.6% of the total and 6.6% of the common variance. Two items load strongly on this factor. These are V561, managerial level effectiveness of performance appraisal systems (.764); and V567, managerial level effectiveness of training and development (.370). As was noted above, this last item has a stronger loading on Factor 3.

Given these results, the question then becomes how many factors should be retained? There are a variety of

statistical and substantive criteria for determining precisely the number of important factors that underlie a set of data. The latent root criterion, perhaps the most common rule, suggests that only factors with eigenvalues greater than 1.0 should be retained. Applying this rule would result in a six-factor solution. A second method, developed by Cattell (1965), suggests that factors should not be extracted beyond the point where the slope of the plotted eigenvalues begins to plateau and approximate a horizontal line. Following Cattell's rule, a four factor solution derived from the factor analysis of these items would appear to be more appropriate.

Yet in the final analysis, perhaps the most important criteria to follow is to retain those factors that are substantively meaningful and interpretable and that also reflect the theoretical goals of one's research. Applying the a priori criterion, it was hypothesized that four independent factors would emerge from the factor analyses. As a result of the exploratory factor analysis, two of the four factors extracted match what was hypothesized. A third factor, Operational level HR Effectiveness, is fairly similar, considering both primary and secondary loadings of the eight items. However, the four Managerial level HR Effectiveness items loaded strongly on three different factors.

When attempting to explain low factor loadings or loadings with signs opposite to that expected, we can

speculate on three probable causes. First, the measurement itself may be uniquely unreliable, i.e., contains random error. Second, the construct may be multidimensional with the low-loading items loading on another factor. Third, the low loadings could be due to a methods factor where some items in an index have been measured differently from others. In this study, all three causes are probable.

Nunnally (1978) suggested that investigations of reliability should be undertaken when new measures are developed. Following this prescription, reliability and convergent validity were specifically assessed at the monomethod level by examining: (1) the reliability of each measure (squared loading of the item in factor analysis with standardized variables); (2) the average variance extracted by each construct; and (3) the internal consistency of each index (Cronbach's coefficient alpha). Internal consistency reliabilities greater than .60 are generally regarded as sufficient for research purposes.

Cronbach's coefficient alpha was then calculated for the indices created based upon theoretical formulations. The Strategic level HR Effectiveness (eight items) and HR-Strategy Linkage (seven items) indices reveal high internal consistencies. The alpha coefficients for these indices are .90 and .82 respectively. The alpha coefficient for the Operational level HR Effectiveness index, with all eight items included, was a respectable .73. Finally, the alpha coefficient for the four-item Managerial level HR

Effectiveness index was considerably lower at .49. These results are presented in Table 4.1.

Table 4.1 Cronbach Alpha Coefficients for Wave 1

	ABBREVIATION	WAVE 1
HR-Strategy Linkage (all items)	(HR-STRAT LINK)	.82
Strategic Level HR Effectiveness	(STREFF)	.90
Managerial Level HR Effectiveness	(MGREFF)	.49
Operational Level HR Effectiveness	(OPEFF)	.73

Though the alpha coefficient for the Managerial level HR Effectiveness index is less than desirable, reliability represents only one dimension of construct validity. Theoretical importance and face validity of the items also influence index construction. I decided to evaluate the results of the factor analyses of the 1985 data prior to determining whether to (1) retain the Managerial level HR Effectiveness index in the conceptual model and (2) develop new indices that depart from prior theoretical formulations.

Univariate Analyses: Wave 2

The descriptive measures for the thirty-four variables selected from the Wave 2 dataset are illustrated in Table B.2, Appendix B. As mentioned above, twenty-seven variables are common to both the 1982 and 1985 studies. Seven variables considered to be theoretically important were

added to the Wave 2 indices to represent dimensions that were not included in the initial study. Three of these are HR-Strategy Linkage variables. The remaining four are Managerial level HR Effectiveness variables.

All of the items were evaluated for the presence of skewness. None was evident, indicating that assumptions of normality were not violated. Consequently, all thirty-four Wave 2 items were retained for additional analyses.

Bivariate Analyses: Wave 2

The Wave 2 Pearson correlation matrix was examined to determine the strength of the bivariate relationships. The largest correlation among the variables was .81, which was between managerial level effectiveness of appraisal-training & development linkage and operational level effectiveness of appraisal-training & development linkage. As the magnitude of this correlation fell below my threshold ($r > .85$), collinearity was not considered to be a problem among these data. Thus, from a psychometric standpoint, all the selected items were considered appropriate for the purposes of this research.

Exploratory Factor Analyses: Wave 2

Following the procedures employed for Wave 1, exploratory factor analysis was first conducted on the twenty-seven Wave 2 variables common to Wave 1 to examine how the emerging factors compared to those extracted from

the exploratory analysis conducted on the 1982 data. Again, seven factors were generated from the varimax rotation, which account for 57% of the variance. None of the items has a communality of less than .30. These results are presented in Table C.2, Appendix C.

Factor 1, which accounts for 14.9% of the total and 26.1% of the common variance, is largely comprised of the strategic level HR effectiveness variables. The item loadings range from .389 to .797. Two of these items, however, have stronger loadings on Factors 5 and 6. These are strategic effectiveness of selection/staffing, with a loading of .631 on Factor 5, and strategic effectiveness of training and development, with a loading of .604 on Factor 6. In addition, two managerial level HR effectiveness items, performance appraisal systems and reward systems, have a secondary loading of .343 and a primary loading of .420 respectively on Factor 1.

Several of the operational level HR effectiveness items load strongly on Factor 2, which accounts for 9.8% of the total and 17.2% of the common variance. In fact, six of the eight items have loadings ranging from .388 to .709, with the remaining two items having secondary loadings ranging from .210 to .269 on this factor. These results provide stronger support for construction of the Operational level HR Effectiveness index with all eight items.

Six of the seven HR-strategy linkage practices have loadings ranging from .301 to .781 on Factor 3, which

accounts for 8.7% of the total and 15.2% of the common variance. Again, two of these items load more strongly on other factors. These are conducting management development programs to support strategic goals, which has a loading of .527 on Factor 7, and changing internal staffing patterns to help implement new strategies, which has a slightly stronger loading of .399 on Factor 5. The seventh HR-strategy linkage practice, establishing career planning processes to help develop managerial talent, has a weak secondary loading of .181 on Factor 3. It also loads more strongly (.399) on Factor 5.

There are six items with fairly strong loadings (.300 to .754) on Factor 4, which accounts for 8.8% of the total and 15.4% of the common variance. Two ᶜ these are managerial level HR effectiveness items: performance appraisals (.754); and rewards (.388). The remaining four items are the operational level HR effectiveness items discussed above. Three have strong, secondary loadings on Factor 2. These are performance appraisals (.739); rewards (.552); and performance appraisal-reward linkage (.591). One operational level HR effectiveness item, appraisal-training & development linkage, has a secondary loading of .300 on this factor.

Three variables have their strongest loadings on Factor 5, which accounts for 5.5% of the total and 9.6% of the common variance. These are changing internal staffing patterns to help implement new strategies (.399); strategic

level selection/staffing (.631); and managerial level selection/staffing (.620). The underlying theme common to these items, obviously, is selection and staffing.

Two items have high loadings on Factor 6, which accounts for 4.8% and 8.4% of the total and common variance respectively. These are strategic effectiveness of training and development (.604); and managerial effectiveness of training and development .563). The common theme, of course, is training and development.

Factor 7, which accounts for 4.5% of the total and 7.9% of the common variance, is comprised of two items with primary loadings greater than .50. These are conducting management development programs to support strategic goals (.527); and establishing career planning processes to help develop managerial talent (.687). Another item, strategic level effectiveness of appraisal-T&D linkage, has a secondary loading of .340 on this factor. All three of these items share a common focus on training and career development activities.

Applying the latent root criterion, all seven factors can be retained as their eigenvalues are greater than 1.0 However, the results of Cattell's scree test suggest that a four-factor solution is again most appropriate. Alpha coefficients for the same four indices are presented in Table 4.2.

In summary, the factor analyses on the 1985 data with

Table 4.2 Cronbach Alpha Coefficients for Wave 2[1]

	ABBREVIATION	WAVE 2
HR-Strategy Linkage (all items)	(HR-STRAT LINK)	.86
Strategic Level HR Effectiveness	(STREFF)	.89
Managerial Level HR Effectiveness	(MGREFF)	.71
Operational Level HR Effectiveness	(OPEFF)	.82

common items revealed that new patterns were emerging, suggesting that alternatives were available for index construction. Thus, I decided to conduct an exploratory factor analyses on the 1985 data with the additional seven items included prior to selecting the indices for the conceptual model.

Exploratory Factor Analysis: Wave 2 (Expanded Data Set). The results of the exploratory factor analysis conducted on the expanded 1985 data set are presented in Table C.3, Appendix C. In total, nine factors emerged, eight of which have eigenvalues greater than 1.00. The amount of total variance explained by the nine factors is 62.3%.

All of the strategic level HR effectiveness items again load strongly on Factor 1 (range=.370-.839) which accounts for 11.1% of the total and 17.8% of the common variance.

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1 Analyses conducted with the same 27 Wave 1 variables.

However, three of these items (strategic selection/staffing; training and development; and training and development-promotion linkage) have stronger primary loadings on Factors 4 and 7.

Nine of the ten HR-Strategy Linkage items have strong loadings on Factor 2, which accounts for 10.1% of the total and 16.2% of the common variance. These loadings range from .375 to .763. However, two items--conducting management development programs to support strategic goals and establishing career planning processes--load more strongly on Factor 8. These loadings are .406 and .795 respectively. Also, one of the new 1985 HR-strategy linkage items, succession plans for top three levels of company management, has a strong primary loading of .541 on Factor 8, which accounts for 3.8% and 6.1% of the total and common variance respectively.

A mix of operational level and managerial level HR effectiveness items, including one new item, load strongly on Factor 3, which accounts for 9.4% of the total and 15% of the common variance. These loadings range from .411 to .737.

Four items have strong loadings on Factor 4, which accounts for 7.4% of the total and 11.9% of the common variance. These include strategic level training and development (.648); strategic level training and development-promotion linkage (.718); managerial level training and development (.493); and managerial level

training and development-promotion linkage (.570). These items center on the effectiveness of training and development and its linkage to preparing people for promotion at the strategic and managerial levels of HR activity.

Factor 5, which accounts for 7.1% of the total and 11.4% of the common variance, contains three operational level HR effectiveness items with primary loadings ranging from .616 to .725, and three other operational level HR effectiveness items with secondary loadings ranging from .225 to .370.

Factor 6, which accounts for 6.4% of the total and 10.3% of the common variance, contains two managerial level HR effectiveness items: appraisal systems-T&D linkage (.386); and overall integration of HR practices (.802). In addition, operational level appraisal systems-T&D linkage, has a strong loading of .784 on this factor.

Strategic level selection/staffing and managerial level selection/staffing load strongly on Factor 7, which explains 4.7% of the total and 7.5% of the common variance. These loadings are .541 and .618 respectively. Factor 8, discussed above, contains HR-strategy linkage training and development items. Finally Factor 9, which explains 2.3% of the total and 3.7% of the common variance, contains one item with a primary loading greater than .30. Operational level HR selection/staffing effectiveness, has a loading of .340 on this factor.

Cattell's scree test was again employed to inform the decision regarding what factors should be retained. The slope of the plotted eigenvalues for the factors begins to level off with the seventh factor. Therefore, these results suggest that retaining a six-factor solution from the factor analysis on the expanded 1985 data is perhaps most appropriate.

A review of the results of the exploratory factor analyses conducted on the Wave 1 and Wave 2 data reveals that some inconsistencies are apparent. Some of the additional factors emerging from the Wave 2 analyses, of course, may be considered minor or sub-factors of the major factors that emerged.

The results of the three exploratory factor analyses arguably provide sufficient empirical support for retaining the Strategic, Managerial, and Operational level HR Effectiveness indices as they were conceptualized. The new HR-Strategy variables, however, didn't load strongly on one factor. Seeking a balance between parsimony and finer-grained factorial solutions, I decided to conduct separate exploratory factor analyses on the seven 1982 and ten 1985 HR-Strategy Linkage items.

<u>Factor Analyses: HR-Strategy Linkage Items</u>. Exploratory factor analysis conducted on the seven 1982 HR-Strategy Linkage items resulted in the emergence of one factor accounting for 48.7% of the total variance. The factor loadings for the items ranged from .515 to .801.

However, the same analysis conducted on the 1985 data with the three new items added resulted in a three factor solution accounting for 51.9% of the variance. These results are presented in Table C.4, Appendix C.

Four items load strongly on Factor 1, which accounts for 19.4% of the total and 37.4% of the common variance. These are modifying reward systems to motivate managers to attain strategic goals (.374); changing ECG's culture to fit strategic goals (.531); modifying organizational structure to fit strategic goals (.783); and changing internal staffing patterns to help implement new strategies (.678). Conceptually, these four items represent a mix of structure and culture themes which the literature suggests are related (Nadler and Tushman, 1987). Hence, this index is labeled Structure/Culture.

Three items with significant loadings comprise Factor 2, which accounts for 18.6% of the total and 38.9% of the common variance. These are matching key managers to strategic goals (.615); identifying the necessary managerial characteristics needed to meet strategic goals (.783); and assessing the potential of managers for attaining strategic goals (.651). As these items represent a mix of selection and assessment activities, the index was simply labeled Selection/Assessment.

Three items load strongly on Factor 3, which accounts for 13.9% of the total and 26.8% of the common variance. These include conducting management development programs to

support strategic goals (.513); establishing career planning processes to help develop managerial talent (.862); and succession plans for top three levels of company management (.424). Collectively, these items represent a mix of planning and management development activities. Thus, the index is labeled Planning/Development.

Index Construction Results

A comparison of the exploratory factor analyses conducted on the Wave 1 and Wave 2 data revealed similarities and differences that influenced the number and composition of indices constructed for the purposes of this research. I settled on creating six indices, three of which represent the HR-Strategy Linkage construct, with the remaining three representing the HR Effectiveness construct.

In brief, the Structure/Culture index was created from four items: modifying reward systems, changing ECG's culture, modifying organizational structure, and changing internal staffing patterns to help implement new strategies. Only two items, modifying reward systems, and changing internal staffing patterns were incorporated in the 1982 questionnaire.

The Planning/Development index was formed through the combination of three items: conducting management development programs; establishing career planning processes; and succession plans for the top three levels of company management. The first two items were measured in

both waves of data collection; the last item was measured in 1985 only.

The third index, Selection/Assessment, was created from three items: matching key managers to strategic goals, identifying necessary managerial characteristics needed to meet strategic goals, and assessing the potential of managers. Again, both items were measured in both waves.

The Strategic level HR Effectiveness indices for 1982 and 1985 were created from eight items. These include strategic level effectiveness of: the selection/staffing process, performance appraisal systems, rewards, training and development practices, performance appraisal system-reward allocation linkage, appraisal system-training and development linkage, training and development-promotion preparedness linkage, and the overall integration of the seven HR practices.

The 1982 Managerial level HR Effectiveness index is comprised of four items. These include managerial level effectiveness of: selection/staffing, performance appraisal systems, rewards, and training and development practices. The same four items were included in the 1985 index along with four new variables: managerial level effectiveness of performance appraisal-reward allocation linkage, performance appraisal systems-training and development linkage, training & development-promotion preparedness linkage, and the integration of the seven HR practices.

The Operational level HR Effectiveness indices for 1982 and 1985 were created from eight items. These include operational level effectiveness of: the selection/staffing process, performance appraisal systems, rewards, training and development practices, performance appraisal system-reward allocation linkage, appraisal system-training and development linkage, training and development-promotion preparedness linkage; and the overall integration of the seven HR practices.

Internal Consistency Coefficients for the Indices Created

Cronbach alpha reliabilities were calculated to assess the internal consistency of the indices. Table 4.3 presents these results for each index for both waves of data collection.

The indices appear to be quite reliable and fairly consistent across both waves. Most of the alpha coefficients are generally higher than the .60 cut-off point that is regarded as sufficient for research purposes (Nunnally, 1978). There are two exceptions, however. One involves the 1982 Structure/Culture index, which is comprised of only two variables. The reliability presented is the correlation between these variables, which is .30. The second exception is the 1982 Managerial level HR Effectiveness index, which has an alpha coefficient of .49. This index was retained for three reasons. First, the same four-item index created with the 1985 measures has an alpha of .71; the eight-item index for 1985 has an alpha of .84,

Table 4.3   Cronbach Alpha Coefficients for Wave 1 and 2

	ABBREVIATION	WAVE 1	WAVE 2
HR-STRATEGY LINKAGE INDICES			
HR-Strategy Linkage (all items)	(HR-STRAT LINK)	.82	.86
Structure/Culture	(STRCUL)	.30[2]	.74
Planning/Development	(PLADEV)	.59	.67
Selection/Assessment	(SELASS)	.78	.79
HR EFFECTIVENESS INDICES			
Strategic Level HR Effectiveness	(STREFF)	.90	.89
Managerial Level HR Effectiveness	(MGREFF)	.49	.84[3]
Operational Level HR Effectiveness	(OPEFF)	.73	.82

both of which are above the recommended minimum. Second, the gap between the 1982 coefficient and the recommended minimum level isn't large. Third, the items that comprise the index are conceptually relevant to my research.

In summary, the results of the methodological procedures employed to develop these indices (illustrated in

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2 Both the 1982 Structure/Culture and Planning/Development indices are comprised of only two items. Thus it was not possible to calculate Cronbach's Alpha coefficient for these two indices for 1982. The reliability measure illustrated is the correlation between the two items comprising each index.

3 Cronbach's alpha coefficient was also calculated for the 1985 four-item Managerial level HR Effectiveness index comprised of the same four items in the 1982 index. The reliability coefficient is .71. There may be a methods effect that accounts for the discrepancy between the 1982 and 1985 reliabilities. The four items measured in 1982 were collected through interviews with study participants. These same items were incorporated in the 1985 survey.

Figure 3.2, the revised conceptual model) suggest that they are sufficiently reliable for my research purposes.

Analysis of Organizational Performance Measures

Univariate and bivariate analyses were also conducted on the financial performance and productivity variables to check for evidence of skewness and multicollinearity. The Return on Investment measures were found to be problematic as the frequency distributions for 1984 and 1985 were highly skewed. A close examination of the data found that extraordinarily high results were reported for one Business Unit for these two years. A check with ECG's controller verified that these results were accurate and were attributed to a sizable advance payment on a government contract prior to product development.

Given the magnitude of the skewness measure, a logrithmic or exponential transformation was ineffective in causing the distribution to approximate normality. To solve the problem, the outlier was simply eliminated from relevant analyses for the 1984-1985 timeframe. The frequency distributions for the remaining variables were considered acceptable, i.e., to closely approximate normality, for the purposes of this research.

Summary

In this chapter, descriptive measures of the items selected for inclusion in the conceptual model introduced in Chapter Three were evaluated. All of the items were found to be appropriate for the purposes of this research.

Results of the analytical procedures used to create the reliable and valid indices for the constructs in the model were also presented. Based on these analyses, six HRM indices were created. The indices and the financial performance and productivity measures are the basis for the analyses conducted at the business unit and individual levels in Chapters Five and Six. On to Chapter Five.

CHAPTER FIVE

AN EXAMINATION OF THE RELATIONSHIP BETWEEN HUMAN RESOURCE
MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN ECG AT THE
BUSINESS UNIT LEVEL OF ANALYSIS

> A paradigm is not so much disproved as
> it is dislodged or supplanted by a
> different paradigm providing a new map
> of the territory--indeed, not only a new
> map but new directions for map making.
>
> Richard Scott
> Organizations: Rational,
> Natural, and Open Systems

Introduction

This chapter presents the findings from the first stage
of detailed analysis of the relationships between the HRM
variables and the performance measures at the business unit
level. It is based on the simple bivariate correlations
between the six HRM indices and the nine financial
performance and productivity measures. As described in
Chapter Three, the survey data were collected at two points
in time--1982 and 1985. The financial and productivity data
for the ECG business units were available for 1982 through
1985.

One of the primary objectives of this chapter as well
as Chapter Seven is to evaluate the predictive validity of
the HRM indices as business unit level and individual level
constructs. Understandably, the small number of cases

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involved at the business unit level of analysis places restrictions on the power of the statistical tests that can be conducted to examine the relationships between the HRM indices and organizational performance. Utilizing data aggregated at the individual level allows for more powerful analyses given the greater number of cases involved, provided that there are not significant differences in business unit results.

Consequently, the results of the analyses of variance conducted to determine whether there are significant differences between the business units are first examined in this chapter. Then the bivariate correlations between the indices and the performance measures at the business unit level are reviewed to evaluate the predictive validity of the HRM indices. In view of the small number of cases and because one business unit recorded exceptional performance results that could adversely affect the stability of the findings, a separate set of analyses was conducted with the outlier excluded. The chapter concludes with a summary and comparative assessment of the key findings derived from these analyses at the business unit level.

As the results of the ANOVAs and correlational analyses occupy many pages and would thus interrupt the flow of this chapter, they are presented in Appendices D, E, and F respectively. Instead, key findings summarized in the form of figures or tables are presented and serve as the reference for the discussion that follows.

Analysis of Variance Results

Making inferences from a small number of cases is risky business. Even though a vast amount of data in various forms was collected for this study, the sample nonetheless was small--eleven business units comprising the largest group in one company. The few number of cases involved limit the statistical tests that can be employed to examine the relationships between the HRM indices and organizational performance. Understandably, this increases the possibility of reaching unjustified conclusions.

Table 5.1 presents summary results of the analyses of variance conducted to test whether the mean scores for the HRM indices across business units are equal. The more detailed ANOVA results are provided in Appendix D. As is evident, significant differences in means at the .05 level were found for only one of the six 1982 HRM variables, Operational level HR effectiveness. Similarly, significant differences in mean scores were found for only one 1985 HRM variable, Managerial level HR effectiveness. These findings indicate that individual level analyses are largely permissible given the relatively few significant differences among the business units. These findings thus enable us to move beyond the identification of significant relationships and patterns to address the issue of causality. The series of regression analyses conducted to examine these relationships will be discussed in Chapter Seven.

Table 5.1 ANOVA Results: 1982 and 1985 HRM Indices

INDEX	1982 GRAND MEAN	1982 SIGNIF	1985 GRAND MEAN	1985 SIGNIF
Structure/ Culture	2.31	.6051	2.63	.2763
Planning/ Development	2.30	.3830	2.88	.2326
Selection/ Assessment	2.58	.3534	2.55	.0695
Strategic HRM Effectiveness	2.70	.2229	2.34	.1051
Managerial HRM Effectiveness	2.92	.0811	2.94	.0087
Operational HRM Effectiveness	2.94	.0040	3.33	.1626

Strategic Human Resource Management, HR Effectiveness, and Organizational Performance: The Predictive Validity

As the research on which this thesis is based is longitudinal, the issue of predictive validity warrants attention. Several criteria have customarily been employed to assess predictive validity, including magnitude of an observed relationship, statistical significance, and importance of the outcome. In the latter case, an outcome of major importance may substantiate the validity of a predictor that actually may explain only a small percentage of its variance. As a general rule, strong relationships are not necessary to attain statistical significance with a

large number of cases, whereas a small number of cases requires quite strong correlations for the same outcome.

Yet, in the final analysis, perhaps the most important criterion is that of utility. Are the HRM indices useful for determining ECG's performance? The correlational analyses conducted in this chapter and the regression analyses reviewed in Chapter Seven provide an opportunity to address this question. Conversely, these analyses will also help determine whether the performance measures may be appropriate predictors of strategic human resource management and HR effectiveness and whether the relationships between these variables may be reciprocal.

Correlations Between the HRM Indices and the Performance Measures: Total Sample

Two separate series of correlational analyses were conducted to examine the relationships between the HRM indices and performance variables and to assess their predictive validity. The first set of analyses included the total sample of the ten 1982 and eleven 1985 ECG business units. These results are presented in Appendix E and will be reviewed first. For comparative purposes, an additional set of correlational analyses were conducted excluding an outlier to examine the stability of the relationships. These results are presented in Appendix F and will be discussed in a later section of this chapter.

The evaluation of the correlational analyses in this chapter is largely restricted to significant findings.

Those relationships referred to as weak have correlations with probabilities ranging from .05<p<.10 [Pearson r (approx) = .52-.67, n = 9-11]. Significant relationships, in turn, will refer to correlations with probabilities less than .05 [Pearson r (approx) > .68-.73].

In most cases, the data are presented by plotting the correlations between the six 1982 and 1985 HRM indices and specific financial performance and productivity variables for 1982 through 1985. The plots are of particular interest for two reasons: 1) they provide information about the general level of the correlations, and 2) they display the pattern of the correlations over time. Tables are also used to present a summary of the relationships between these variables by level of significance from 1982 through 1984.

To facilitate the interpretation of the results, lagged analyses will refer to the correlations of the 1982 HRM indices to the 1982-1985 financial performance and productivity measures. To avoid confusion, the correlations of the 1982-1985 financial performance and productivity measures to the 1985 HRM indices will be referred to as cross-lagged analyses. This approach will also be utilized to facilitate the interpretation of the regression analyses discussed in Chapter Seven.

Correlations between HRM and Financial Performance

Plots for the cross-sectional and lagged correlations of the six 1982 HRM indices to the four financial performance measures are presented and reviewed in this

section. In addition, cross-lagged plots illustrating the relationship between the financial performance measures and the 1985 HRM indices are presented where the correlations approach or attain significance.

HRM and Revenue Growth. Figure 5.1 illustrates the correlations of the 1982 HRM indices to 1982-1985 Revenue Growth for the ECG business units. On a general level, in view of the small number of cases, only a few of the correlations reach statistical significance at the .05 level ($r > .62$). The plots indicate that though two of the HRM indices may be useful predictors of Revenue Growth, their effect seems to be long-term rather than concurrent, or short-term. These are Managerial level HR effectiveness and 1984 Revenue Growth, and Operational level HR effectiveness and 1984-1985 Revenue Growth. Unequivocally, the relationships between these variables are complex and not very stable.

Despite the inconsistencies in the plots, some generalizations can be made, however. The three HR effectiveness measures have weak concurrent relationships with Revenue Growth that become negative in 1983, and moderately strong and positive in 1984-1985. Structure/Culture and Selection/Assessment have fairly stable, nonsignificant relationships with Revenue Growth over the four-year timespan that mirror the pattern of the HRM effectiveness indices, but with a much less severe slope. Planning/Development, on the other hand, displays a

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FIGURE 5.1: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES
AND REVENUE GROWTH (TOTAL SAMPLE)

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
⊖ STRATEGIC HR EFFECTIVENESS
* MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS
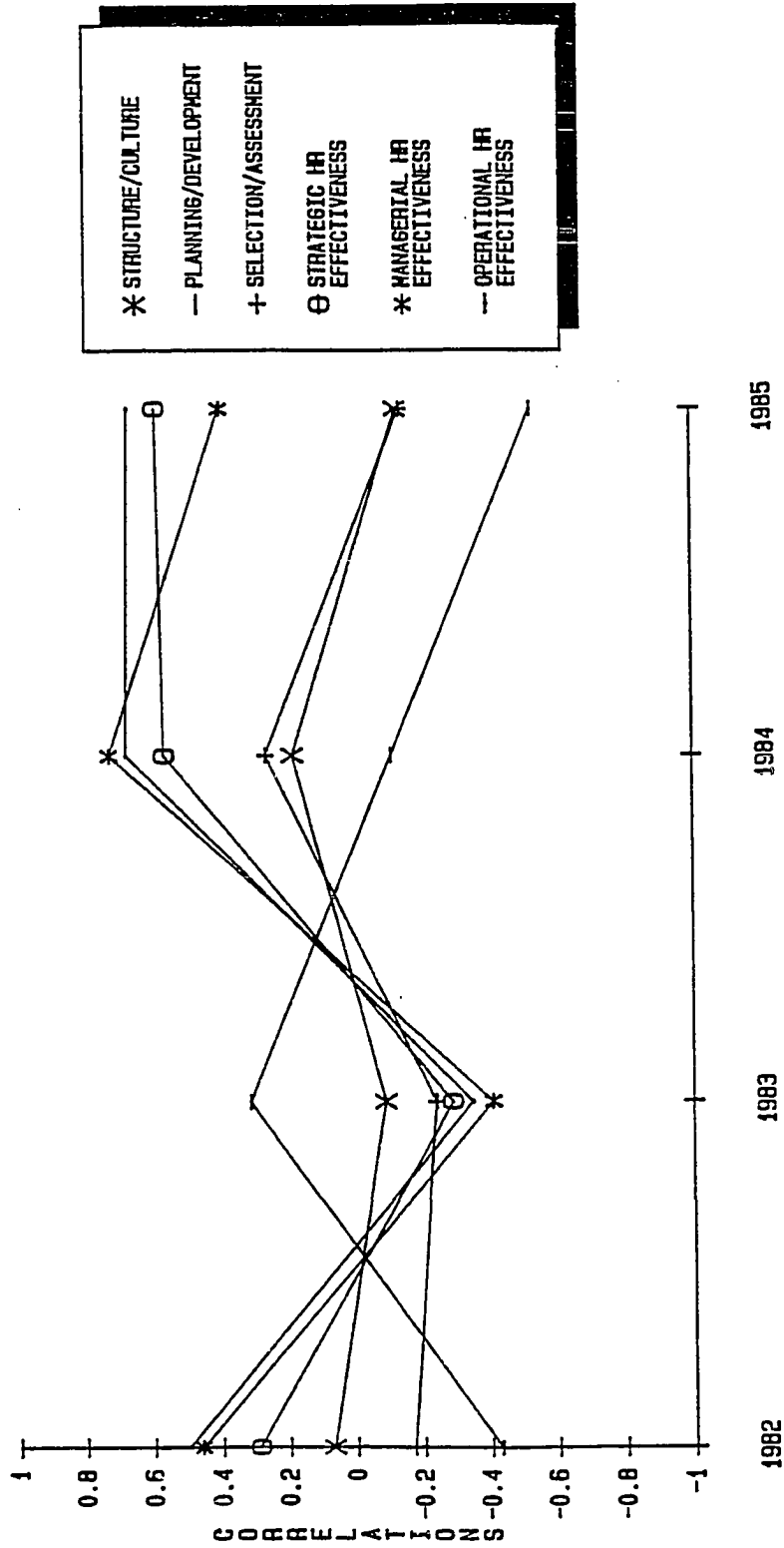
plot pattern opposite the others from 1982-1984. Its relationship with Revenue Growth is weak, at best.

The abrupt changes in direction and slope of the curves from one year to the next mandate caution in interpreting these findings. In general, a slope that trends upwards over time can imply a cause and effect relationship provided that unidirectional causality is assumed. A plot with more than one peak rather than a consistent upward trend, on the other hand, suggests a more complex relationship and can be an indicator of reciprocal causality.

As a consequence, the nonsignificant 1982 relationships followed by the drop in the 1983 correlations may have several interpretations. On one hand, the strategic human resource management and HR effectiveness variables may have long-, rather than short-term payoffs in Revenue Growth. The effects of the level of the HRM indices are mostly positive, but involve a lag factor. On the other hand, reciprocal causality may be at play--perhaps the significant increase ECG experienced in 1983 Revenue Growth is affecting the direction and strength of the relationship between these variables.

The cross-lagged correlational analyses illustrated in Figure 5.2 are useful in enhancing our comprehension of the relationship between these variables. In some respects, the pattern of the plots bears a resemblance to the cross-sectional and lagged plots as evidenced by the sharp decline in the 1983 correlations followed by a rise in the 1984

FIGURE 5.2: PEARSON CORRELATIONS BETWEEN 1985 HRM INDICES AND REVENUE GROWTH (TOTAL SAMPLE)
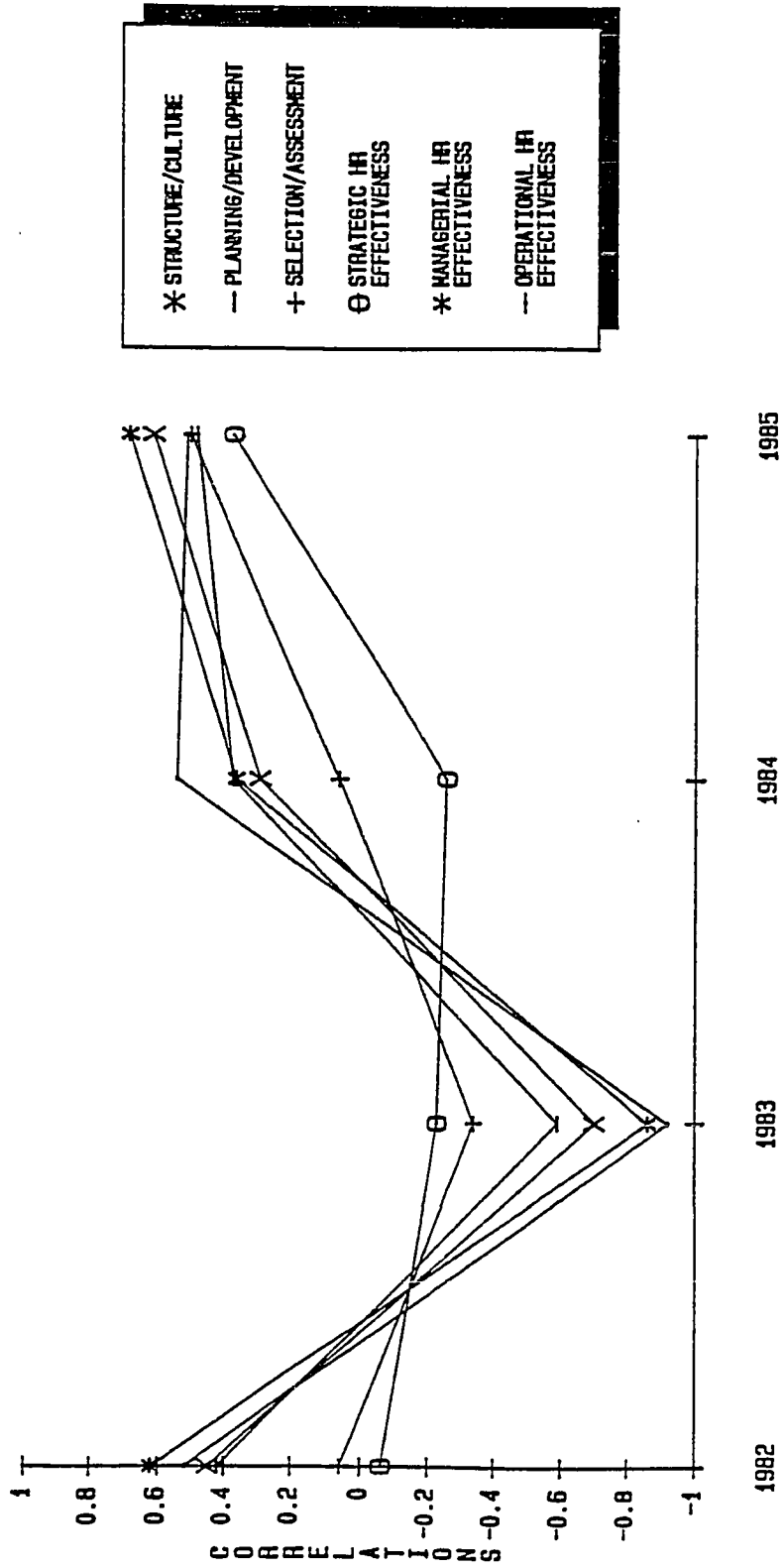
correlations. These data reflect the substantial 1983 Revenue Growth performance results for ECG in comparison to the other three years included in these analyses. From 1983 onward, however, the plots are fairly stable and generally rise upwards.

Several of the correlations are significant: 1982 Revenue Growth has a strong, positive relationship with Managerial level HR effectiveness; 1983 Revenue Growth has a strong, negative relationship with Structure/Culture, and a very strong, negative relationship with both Managerial and Operational level HRM effectiveness. In addition, 1985 Revenue Growth has a strong, positive relationship with Structure/Culture and Managerial level HR effectiveness.

These findings further support the contention that the relationships between the HRM indices and Revenue Growth are complex and that causality may be reciprocal. However, it is also noted that the significant cross-lagged correlations between Revenue Growth and the 1985 HRM indices are greater in frequency and magnitude than the cross-sectional and lagged correlations between the 1982 HRM indices and Revenue Growth. Though this suggests that Revenue Growth has the stronger causal effect, this conclusion is still tentative.

HRM and Operating Profit Rate. Figure 5.3 illustrates the cross-sectional and lagged correlations between the six 1982 HRM indices and 1982-1985 Operating Profit Rate. On a general level, with the exception of 1982 Operational level HR effectiveness and 1982-1984 Strategic level HR

FIGURE 5.3: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND OPERATIONS PROFIT RATE (TOTAL SAMPLE)
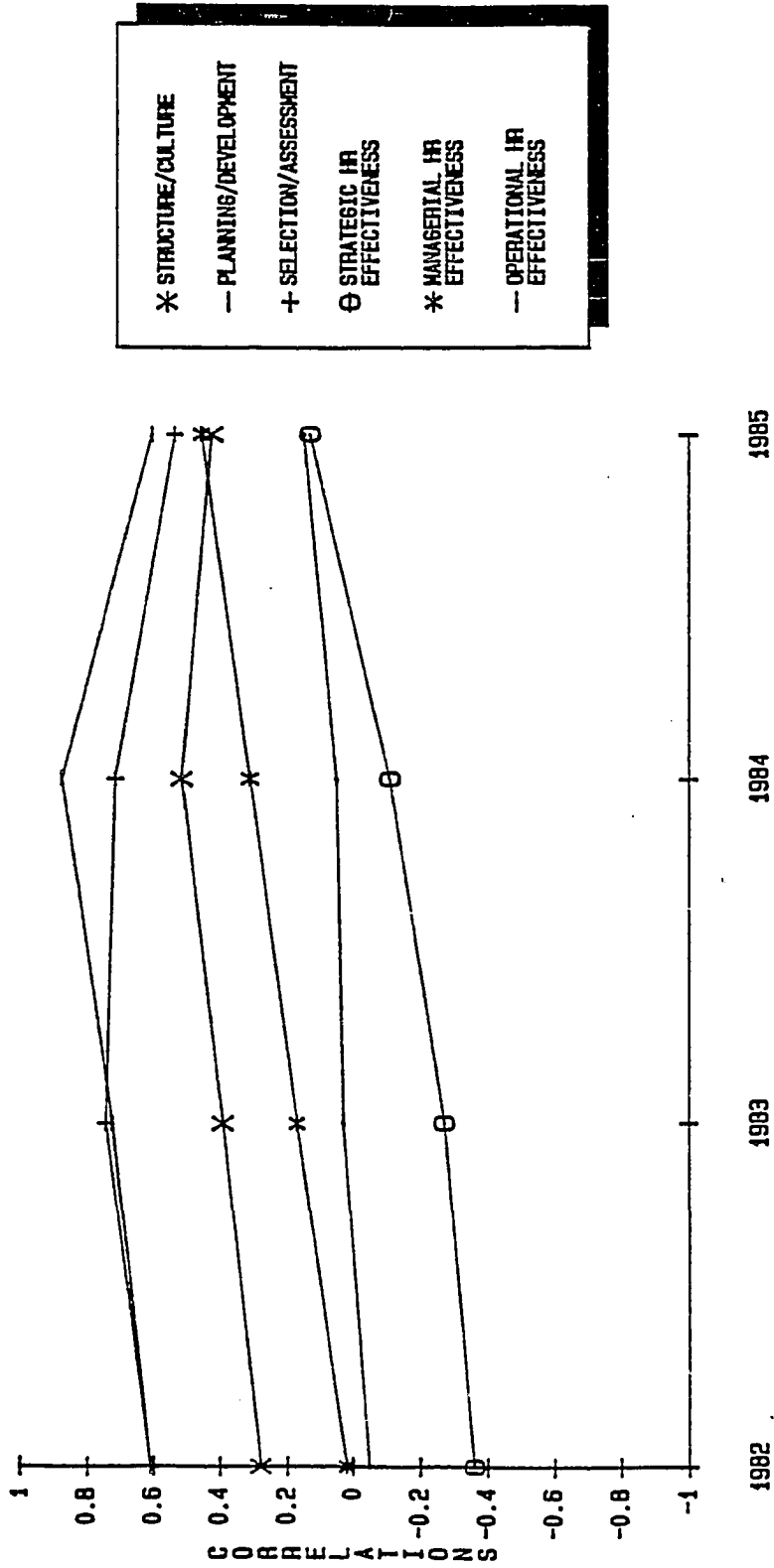
effectiveness, the correlations are positive. None of the concurrent relationships are significant, though both Planning/Development and Selection/Assessment indices come close. These two indices have strong lagged relationships with this performance measure. Also, none of the lagged correlations between the HR effectiveness indices and 1982-1985 Operating Profit Rate are significant. The pattern of the correlations is fairly stable and generally trends upward with the exception of the three strategic HRM indices whose correlations with Operating Profit diminish from 1984 to 1985. These findings indicate that Planning/Development and Selection/Assessment may be quite useful in predicting short-term through long-term performance.

Considerable support for the direction of causality is provided by the results of the cross-lagged correlational analysis of the relationship of the 1985 HRM indices to 1982-1985 Operating Profit Rate (Table E.2, Appendix E). A fairly stable pattern emerged, with none of the correlations approaching significance.

HRM and Return on Investment. Figure 5.4 illustrates the plots of the correlations of the 1982 HRM indices to 1982-1985 ROI. At the general level, the plots exhibit similar characteristics. All commence with positive, mostly insignificant correlations in 1982, most rise slightly in 1983, then all decline and become negative in 1984-1985. Though there is little variation in the pattern of the plots for the six HRM indices, there is considerable difference in

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FIGURE 5.4: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 RETURN ON INVESTMENT (TOTAL SAMPLE)

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
θ STRATEGIC HR EFFECTIVENESS
* MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS
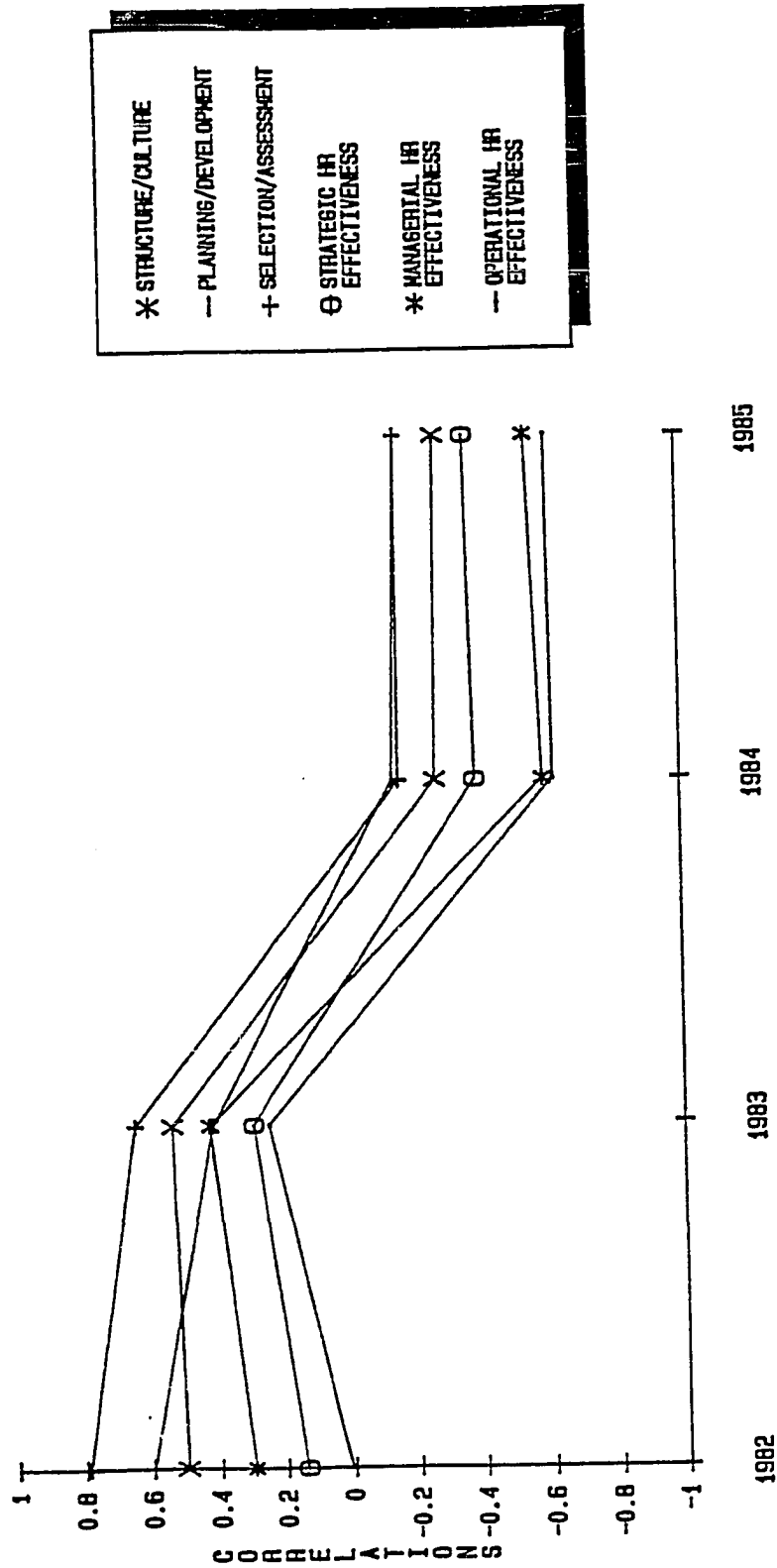
the magnitude of the correlations. However, only two of these relationships are statistically significant. These are Selection/Assessment and 1982-1983 ROI (.79 and .63). Operational level HR effectiveness has a weak negative relationship with 1984-1985 ROI that approaches, though falls short of reaching statistical significance at the .05 level.

To explore whether the fluctuations in the pattern of these plots may be attributed, in part, to reciprocal causation, the cross-lagged correlational analyses of the 1985 HRM indices to 1982-1985 ROI (Table E.3, Appendix E) were reviewed. No evidence of strong relationships was found. None of the correlations approached significance.

One interesting observation pertains to the positive correlations between the HRM indices and 1983 ROI compared to the negative correlations between the same indices and 1983 Revenue Growth. Though both financial performance measures are particularly prone to short-term fluctuations, in this case, the HRM correlations with ROI lag behind those with Revenue Growth by a year. An argument can be made that accounting practices may partially explain the difference. However, it was also noted at the beginning of this chapter that one business unit recorded extraordinary financial results. Consequently, this outlier may be adversely affecting some of these relationships.

Second, different HRM indices are strongly correlated to these performance measures at different points in time.

The strong, positive relationships between the Managerial and Operational level HR effectiveness indices and Revenue Growth are lagged, appearing in the third and fourth years whereas the strong relationship between Selection/Assessment and ROI is concurrent and short-term. Removing the outlier may alter the nature and direction of these relationships, especially since the business unit in question reported extremely high ROI for 1984-1985.

HRM and Average Investment Rate. The plots of the correlations between the six 1982 HRM indices and 1982-1985 Average Investment Rate are displayed in Figure 5.5. At the general level, none of the HR effectiveness variables has a significant relationship with Average Investment Rate. However, both Planning/Development and Selection/Assessment have a strong negative relationship with 1982-1983 Average Investment Rate.

An examination of the pattern of the plots yields a slight upward trend for all of the relationships with the exception of Strategic level HR effectiveness, which drops off in 1985. The stability of these plots suggests that causality, in this case, may be unidirectional. A review of the cross-lagged results (Table E.4, Appendix E) supports this tentative conclusion as none of these relationships approaches significance.

Correlations between HRM and Productivity

Compared to the financial performance measures, there were relatively fewer significant correlations of the HRM

FIGURE 5.5: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 AVERAGE INVESTMENT RATE (TOTAL SAMPLE)
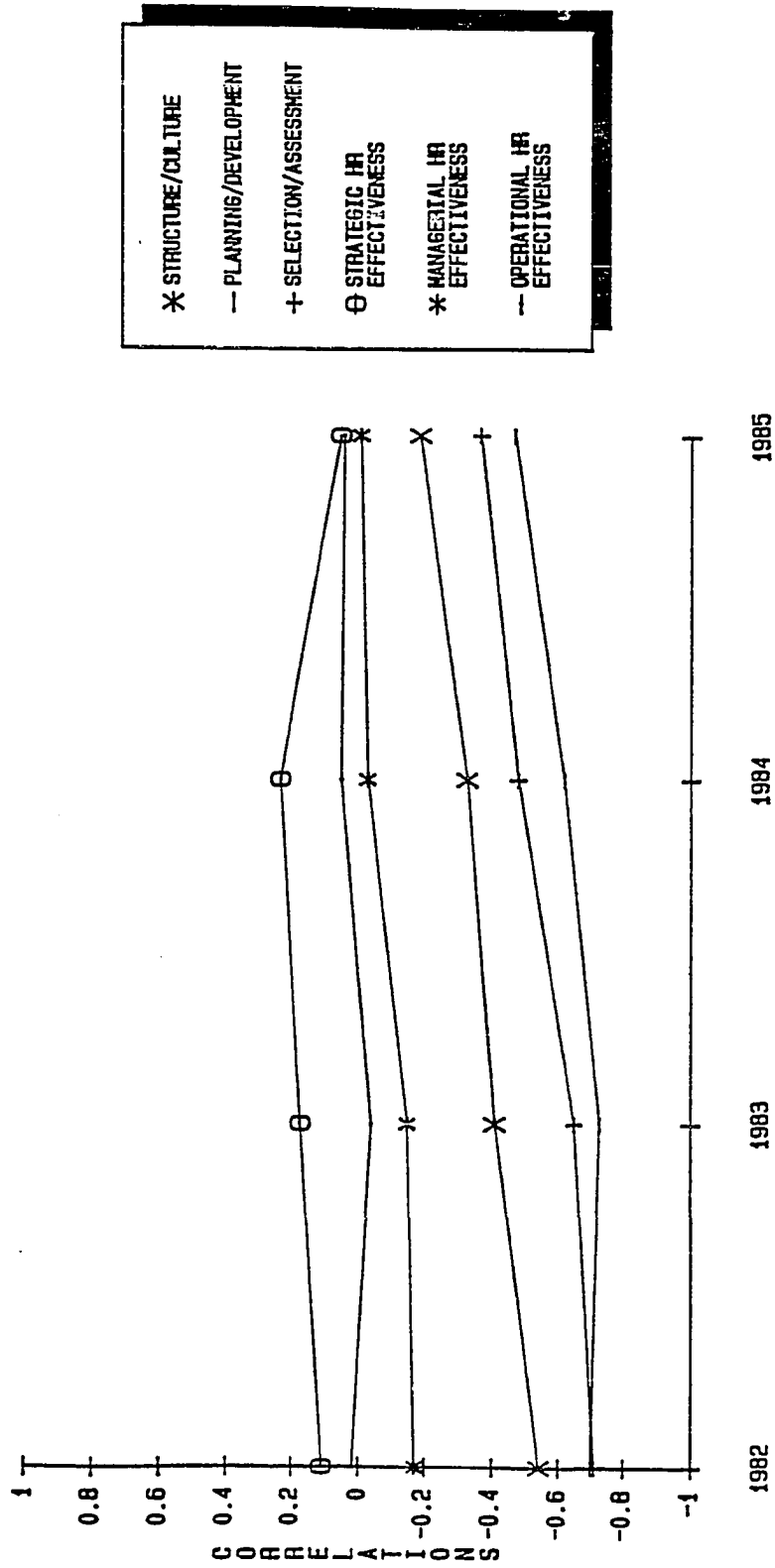
indices to the five productivity measures. In this section, plots illustrating significant cross-sectional, lagged, and cross-lagged relationships between the six HRM indices and specific productivity measures are presented and discussed.

HRM and Value-Added Sales per Employee. Contrary to expectations, no significant cross-sectional, lagged, or cross-lagged relationships were found between the six HRM indices and three of the productivity variables: Sales to Pay, Sales per Employee, and Value-Added Sales per Employee. However, in the case of the latter index, as illustrated in Figure 5.6, a few of the relationships approach significance. These include the correlations of 1982 Selection/Assessment to 1983-1984 Value-Added Sales per Employee. This suggests that selecting and appraising employees for attaining strategic business objectives, in ECG's case, may have a mid-range to long-term payoff in productivity.

The pattern of these plots is fairly stable, with a few exceptions. Though Selection/Assessment rises toward significance in 1983-1984, it falls off in 1985. Also, Strategic HR effectiveness, after exhibiting little to no relationship with this productivity measure, rises considerably to a near-significant level in 1985. Unequivocally, the relationship between these variables is weak. An examination of the cross-lagged correlations between the 1982-1985 Value-Added Sales per Employee measures and the 1985 HRM indices (Table E.7, Appendix E)

FIGURE 5.6: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES
AND 1982-1985 VALUE-ADDED SALES PER EMPLOYEE (TOTAL SAMPLE)
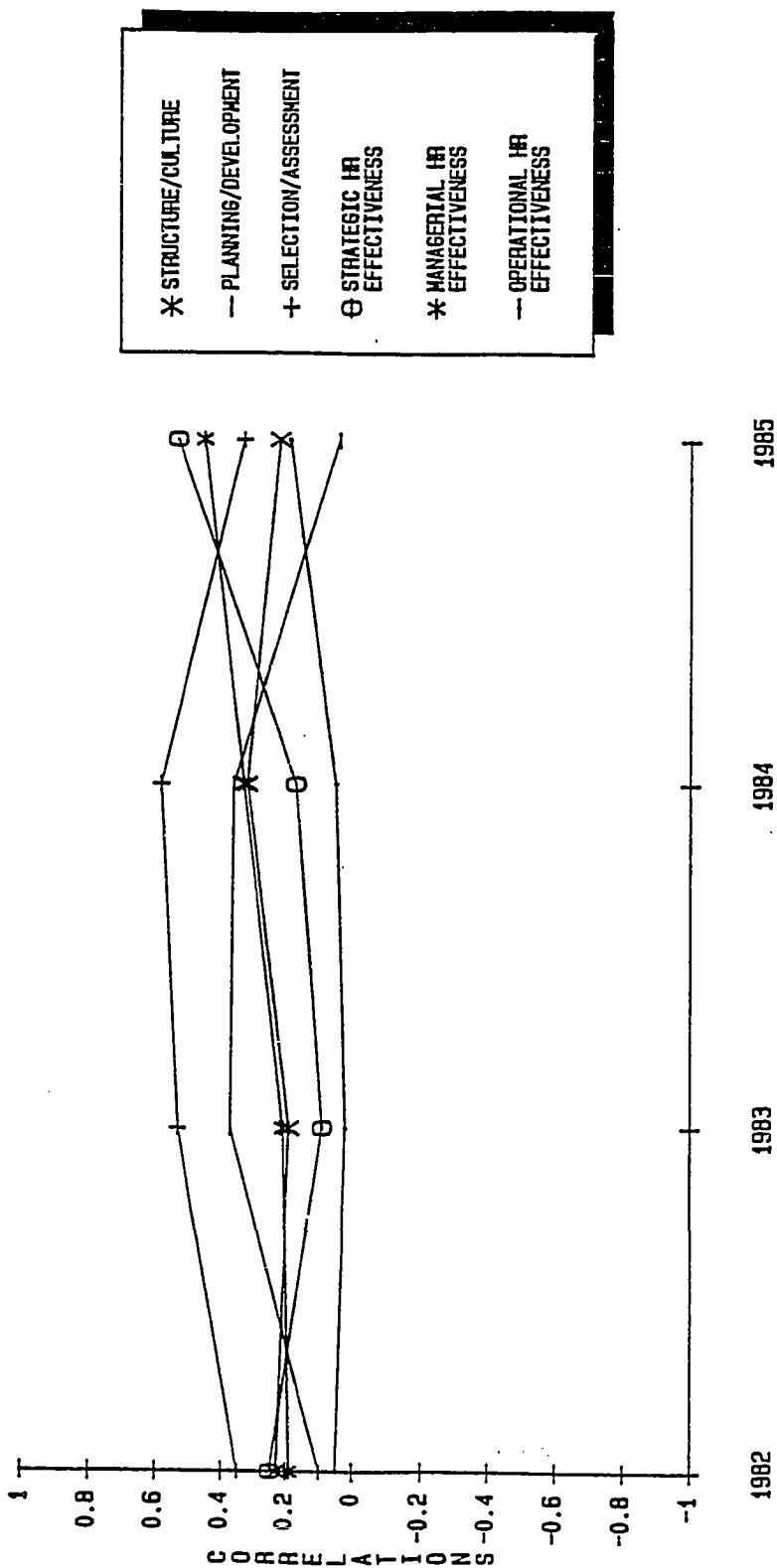
reveals similar findings. The pattern, though a mix of positive and negative correlations, is fairly stable and there are no significant relationships among the variables.

HRM and Gross Inventory Rate. Figure 5.7 displays the plots illustrating the cross-sectional and lagged relationships between the HRM indices and Gross Inventory Rate. As is evident, on the general level, all of the correlations are negative. Selection/Assessment has a significant concurrent and short-term relationship with 1982-1984 Gross Inventory Rate. Planning/Development, too, is strongly correlated with the 1983 measure, and has a weak, though nonsignificant relationship with the 1984 measure.

The pattern of the plots is also interesting. Three of the six indices exhibit a stable pattern that generally slopes upward. However, the remaining plots are somewhat inconsistent, suggesting that there may be significant cross-lagged correlations between the 1982-1985 Gross Inventory Rate measures and a few of the 1985 HRM indices. An examination of these correlations, illustrated in Figure 5.8, does reveal several significant relationships. The 1982 Gross Inventory Rate measure is strongly correlated with both 1985 Structure/Culture (-.84) and Operational level HR effectiveness (-.67). Reciprocal causality is also apparent as the 1982-1985 productivity measures are strongly correlated with Planning/Development. Again, the number and magnitude of the significant cross-lagged correlations are

FIGURE 5.7: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND
1982-1985 GROSS INVENTORY RATE (TOTAL SAMPLE)
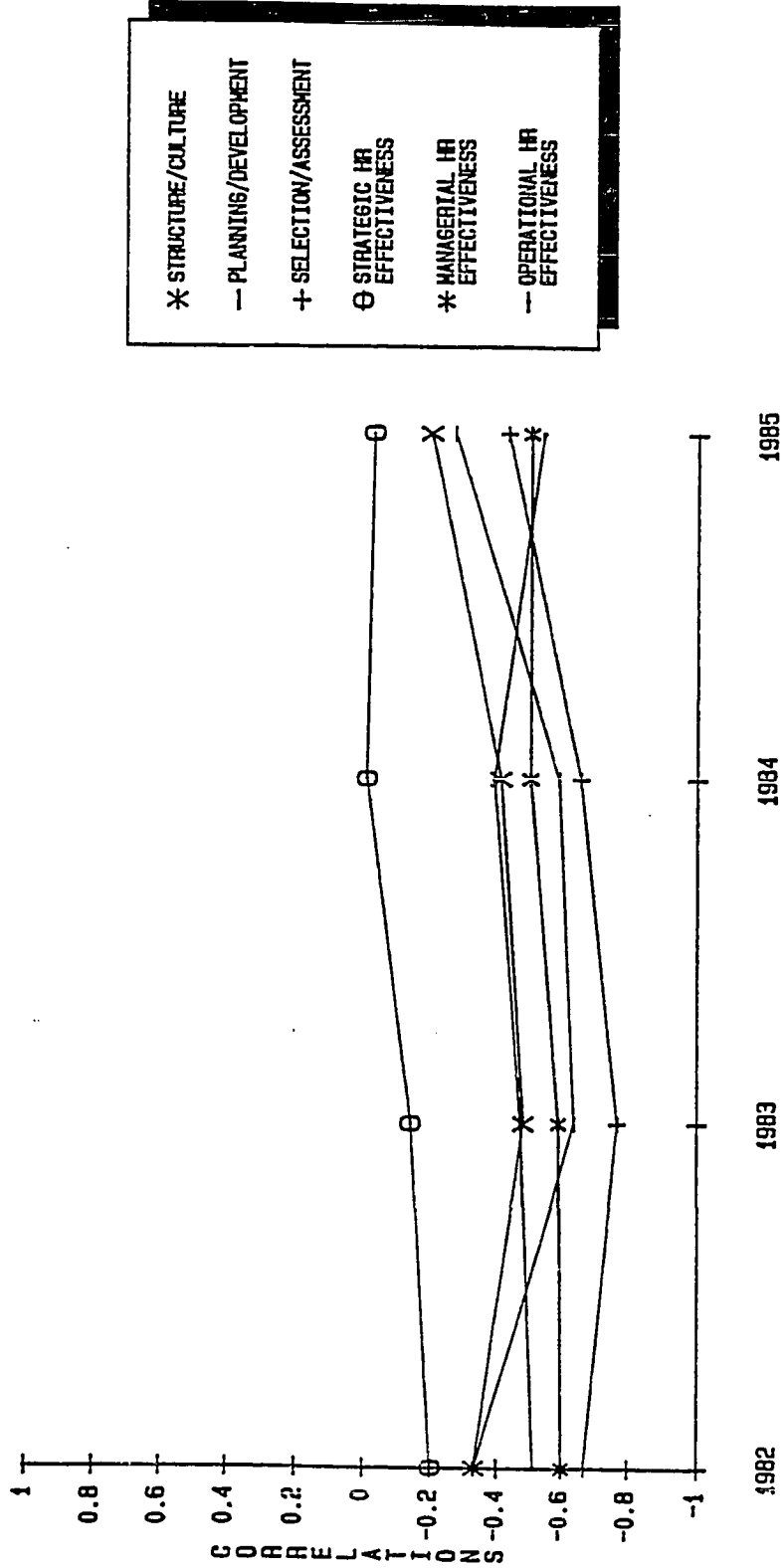
FIGURE 5.8: PEARSON CORRELATIONS BETWEEN 1985 HRM INDICES
AND 1982-1985 GROSS INVENTORY RATE (TOTAL SAMPLE)
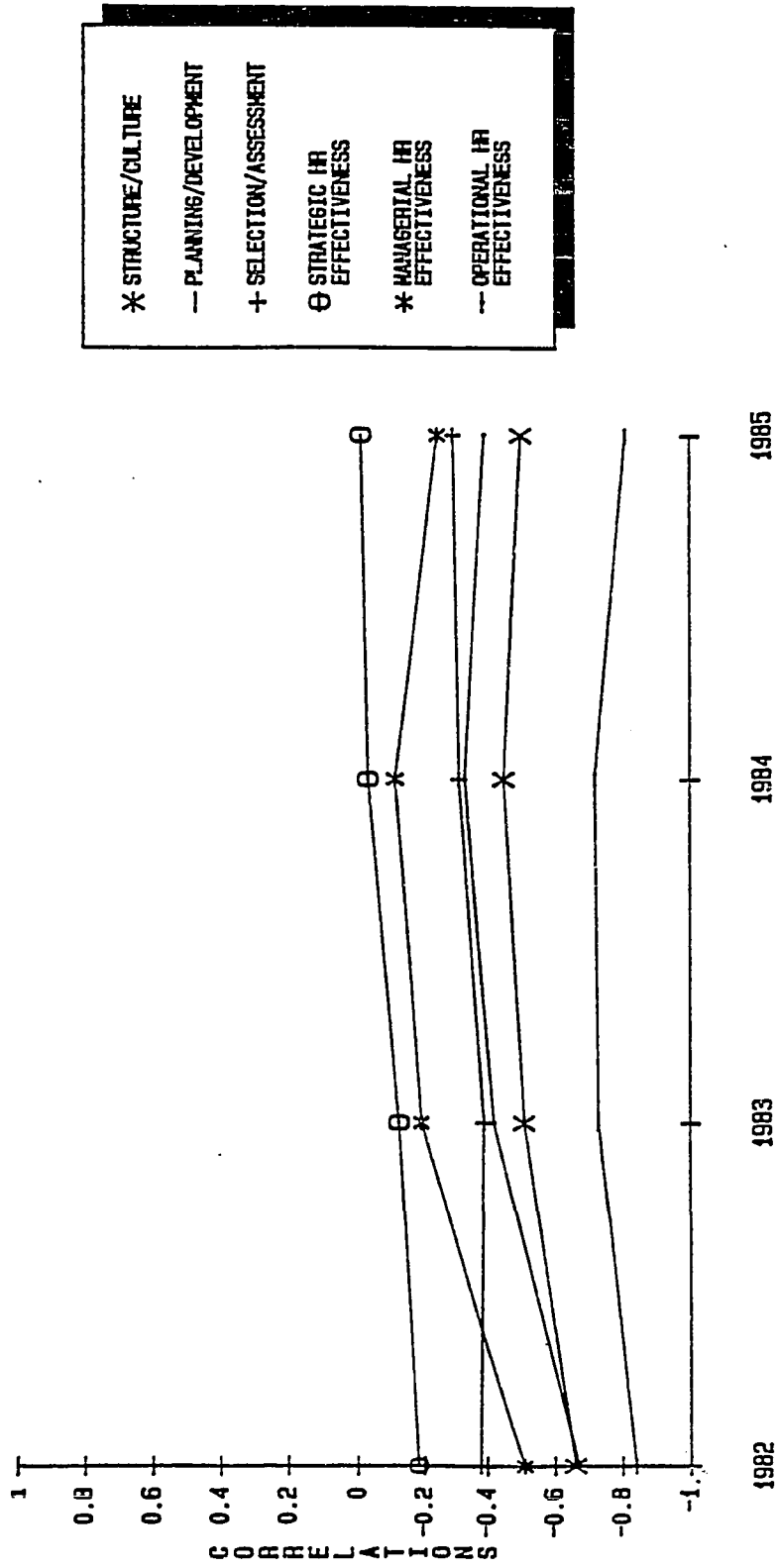
greater than those of the cross-sectional and lagged correlations, suggesting that Gross Inventory Rate has a stronger causal effect on HRM.

HRM and Scrap/Rework Rate. The cross-sectional and lagged relationships of the HRM indices to Scrap/Rework Rate are illustrated in Figure 5.9. In general, all of the correlations are negative, though none of the relationships are statistically significant. Two correlations do approach significance. These are the correlations of Structure/Culture to 1985 Scrap/Rework Rate (-.61) and Selection/Assessment to the 1983 measure (-.58).

The pattern of these plots varies. The three HR effectiveness plots have fairly stable curves. However, the three strategic HRM plots exhibit some inconsistencies. This suggests that there may be stronger cross-lagged than cross-sectional or lagged relationships between these variables. Figure 5.10 illustrates the cross-lagged plots and reveals a significant negative concurrent correlation of 1985 Scrap/Rework Rate to Selection/Assessment (-.64). The 1983-1984 Scrap/Rework measures have weak, though nonsignificant relationships with Planning/Development. These findings tentatively suggest that the 1982 Scrap/Rework measure may have a unidirectional causal effect on two of the 1985 strategic HRM indices.

FIGURE 5.9: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES
AND 1982-1985 SCRAP/REWORK RATE (TOTAL SAMPLE

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
⊖ STRATEGIC HR EFFECTIVENESS
✱ MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS

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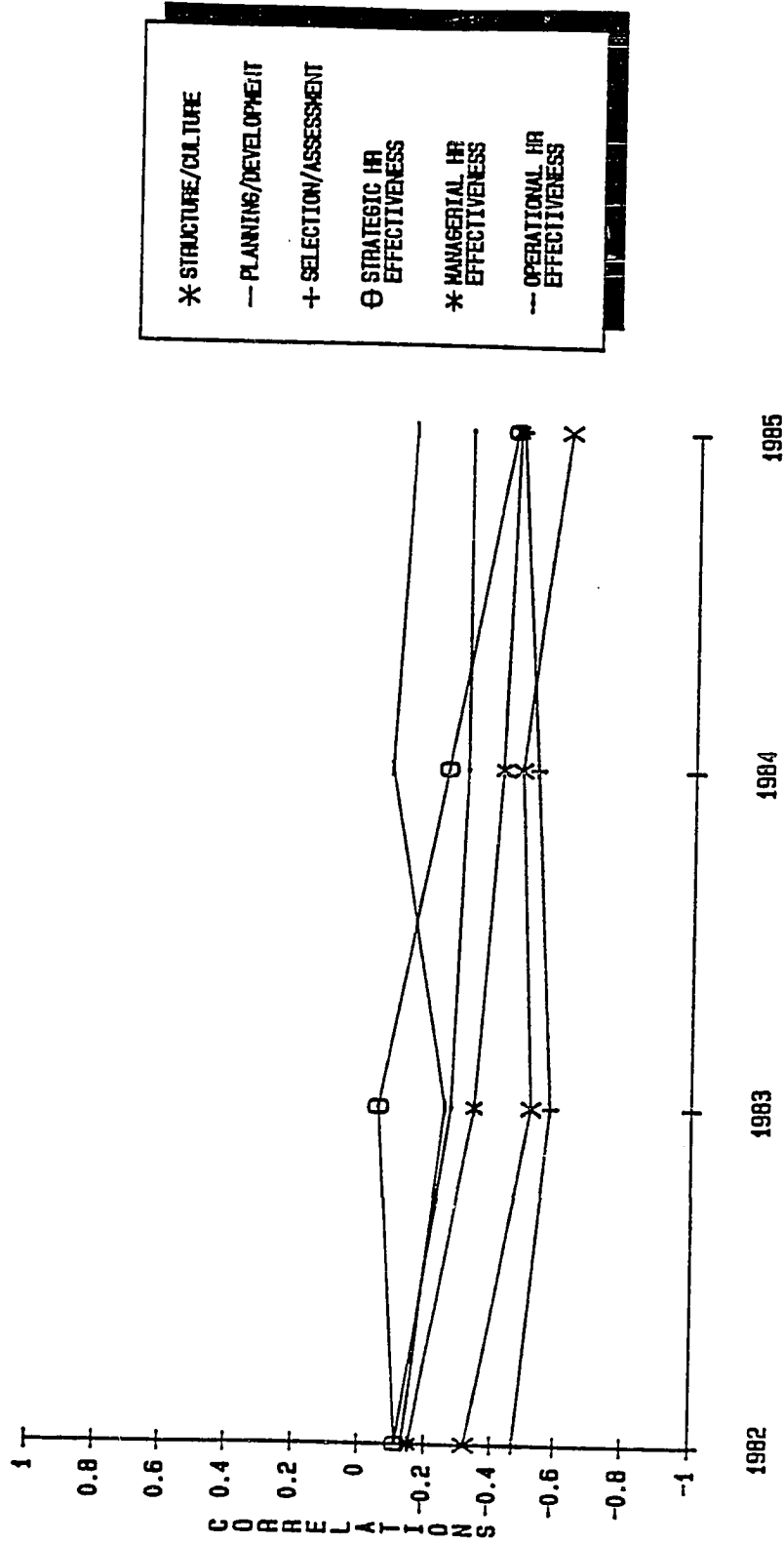
FIGURE 5.10: PEARSON CORRELATIONS BETWEEN 1985 HRM INDICES
AND 1982-1985 SCRAP/REWORK RATE (TOTAL SAMPLE)

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
Ө STRATEGIC HR EFFECTIVENESS
* MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS
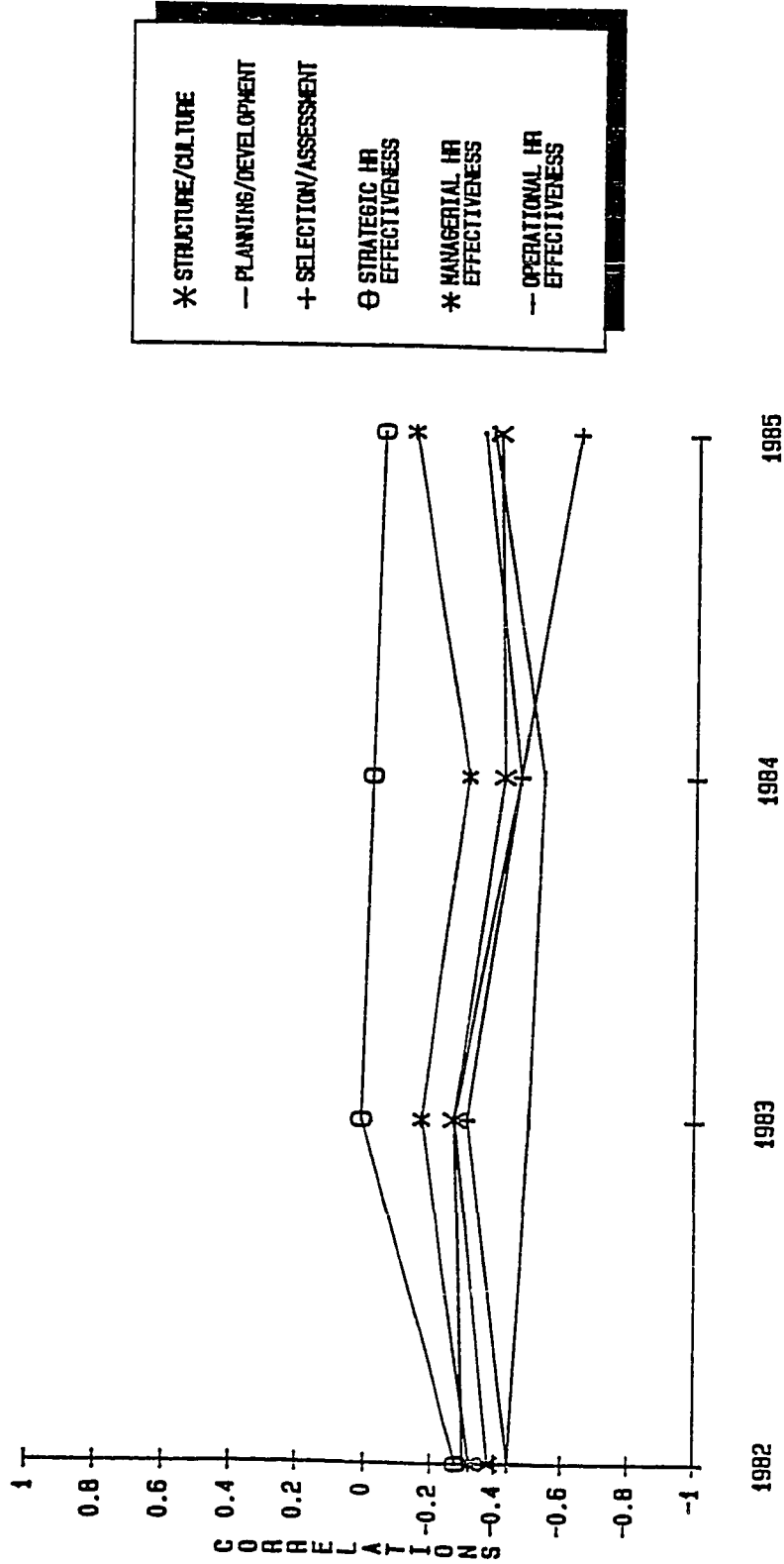
<u>Correlations between the HRM Indices and</u>
<u>the Performance Measures: Outlier Excluded</u>

In Chapter Three it was mentioned that one of the ECG business units recorded exceptional performance results. This outlier, in many respects, is a double-edged sword. On one hand, an outlier can lead to an underestimation or overestimation of the true magnitude of the correlations between variables, creating a statistical artifact where no real relationship exists. As such, it can have a potentially potent adverse effect on analytical results, especially in cases where the sample size is small. Yet on the other hand, eliminating it defies reality. It exists and is a major contributor to ECG's overall performance.

In the case of the ECG outlier, advanced payment on federal contracts have yielded exceptionally high performance results, especially ROI. Though not the norm, it has not been unusual to observe triple-digit ROI results within the defense industry. To the inquisitive reader, the question remains, just how much of an outlier is the ECG business unit? The answer--a sizable one, with 1984-1985 ROI results well into quadruple digits.

From the first question follows the second--what would the results of these analyses look like without the outlier? The proper response to this question calls for repeating the entire analysis with the outlier excluded. These findings are presented in Appendix F. The differences between the two series of analyses are the focal point of the discussion that follows.

In brief, the end result is that several more significant relationships between the HRM variables and the performance measures emerged from this set of analyses, which also enhances the predictive validity of the HRM indices. However, a few relationships that were previously significant no longer are. Of course, the fewer number of cases has also increased the threshold for statistical significance ($r > .66$).

Correlations between HRM and Financial Performance

HRM and Revenue Growth. Figure 5.11 portrays the plots of correlations between these variables with the outlier excluded. As is evident, the pattern of the plots is very similar to the pattern of the correlations associated with the total sample. However, there is now only one significant relationship compared to three. The correlations of Managerial and Operational HR effectiveness to 1984 Revenue Growth approach but are no longer statistically significant. The relationship that remained significant is between 1982 Operational level HR effectiveness and 1985 Revenue Growth (.73).

Removing the outlier has little effect on the cross-lagged correlation results, presented in Figure 5.12. However, the correlation between 1984 Revenue Growth and Operational HR effectiveness (.79) becomes significant, which provides stronger support for the contention that there is a reciprocal relationship between these variables.

FIGURE 5.11: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 REVENUE GROWTH (OUTLIER EXCLUDED)
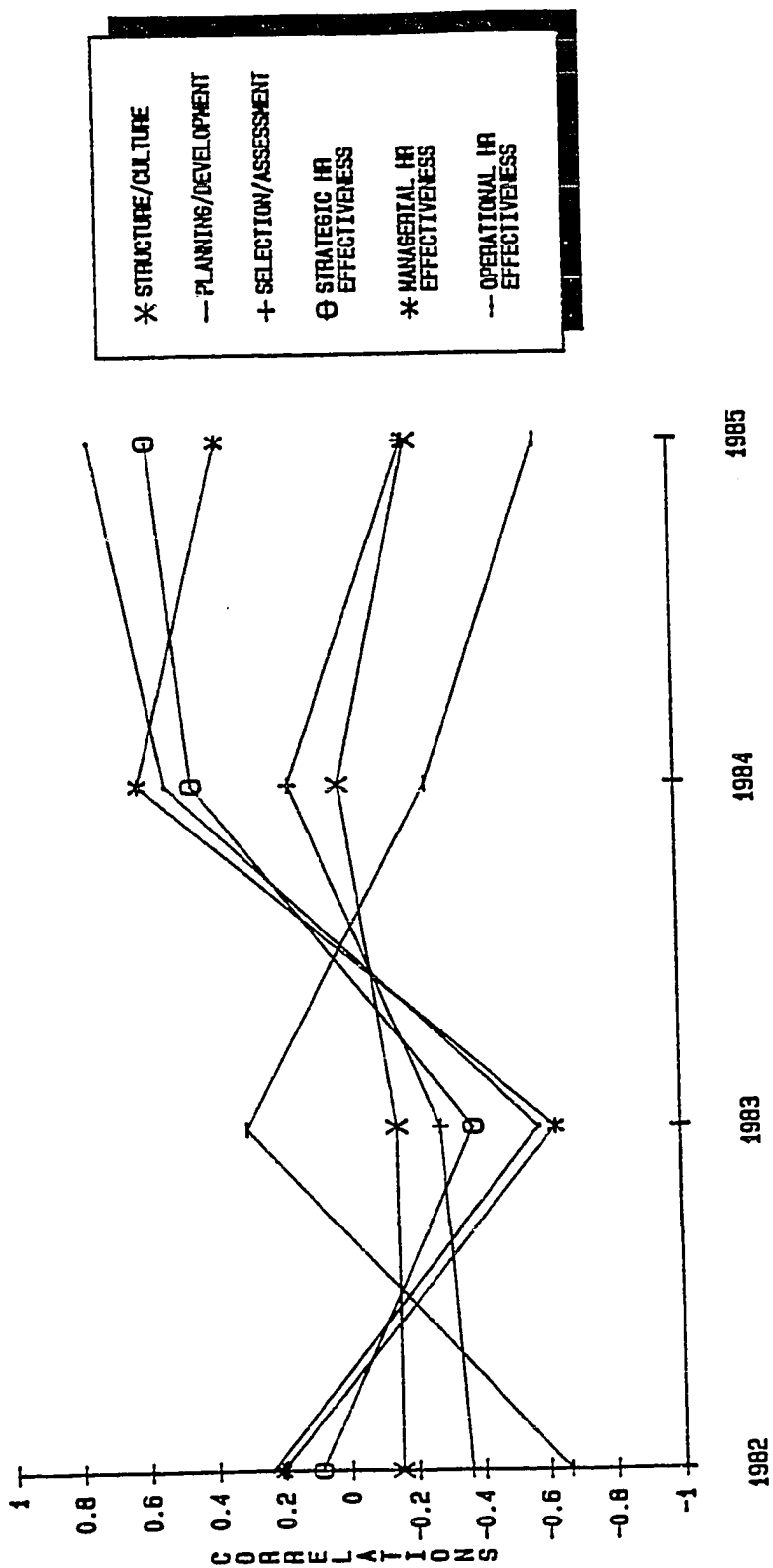
FIGURE 5.12: PEARSON CORRELATIONS BETWEEN 1985 HRM INDICES
AND 1982-1985 REVENUE GROWTH (OUTLIER EXCLUDED)
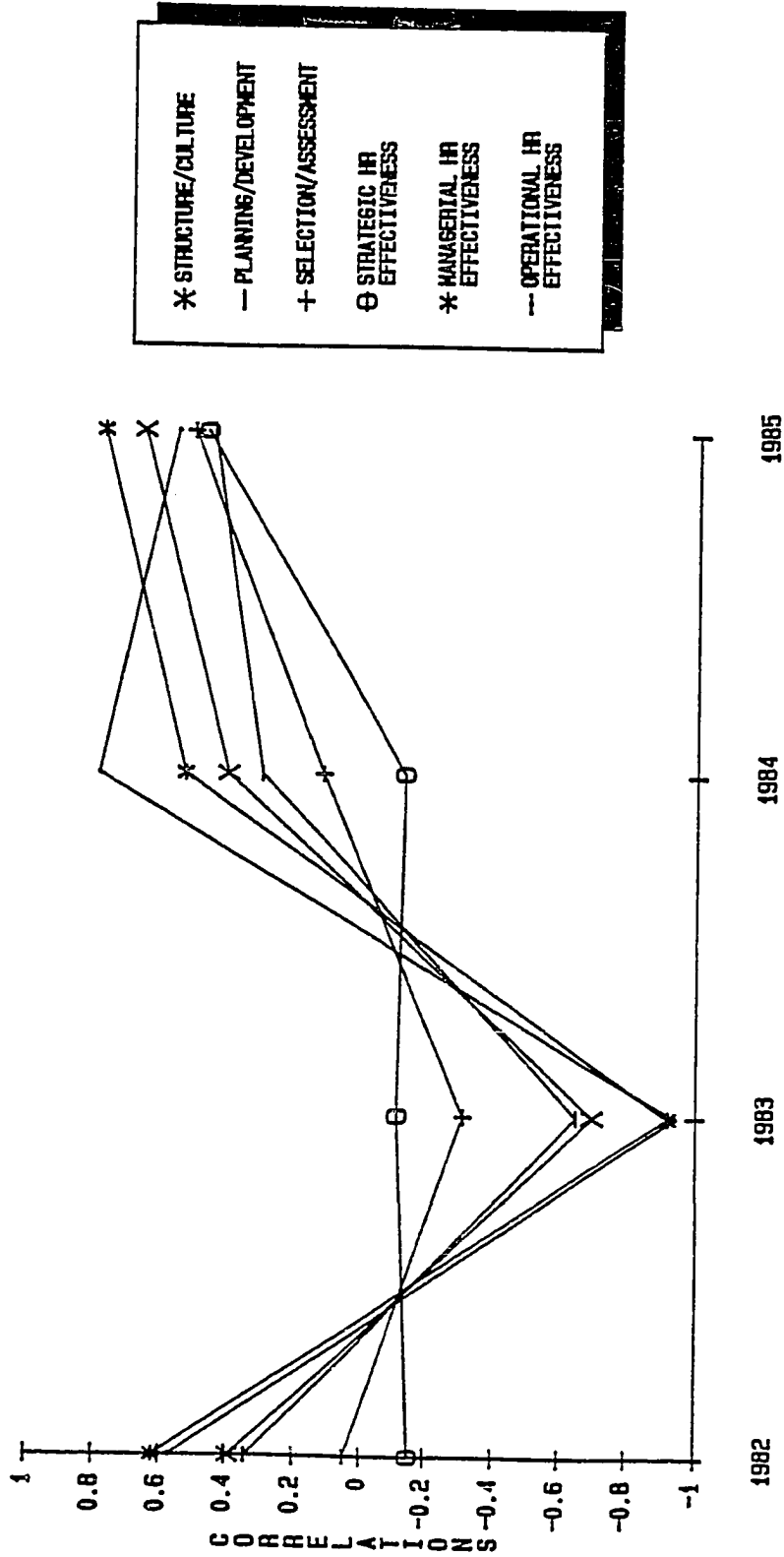
HRM and Operating Profit Rate. Figure 5.13 illustrates the plots of the correlations between the HRM indices and Operating Profit Rate. Again, though the pattern changes very little from the plots for the total sample, the number and magnitude of the significant correlations do increase. In particular, the relationship between Managerial level HR effectiveness and 1985 Operating Profit Rate (.66) reaches significance and the correlation of 1982 Planning/Development to 1984 Operating Profit Rate becomes highly significant (.91).

A review of the cross-lagged correlations (Table F.2, Appendix F) reveals no noticeable change in the relationships between these variables. None of the correlations approach significance, which further suggests that there is unidirectional causality between the measures.

HRM and Return on Investment. As expected, the most drastic change to occur as a result of the elimination of the outlier is in the relationships between the HRM indices and ROI, which are illustrated in Figure 5.14. Though there is no net increase in the number of significant relationships, all of the 1984 and 1985 correlations have shifted from negative to positive, and a few approach statistical significance. These include the correlations of Structure/Culture to 1982 and 1984 ROI; Selection/Assessment to 1984 ROI; and Managerial level HR effectiveness to 1982 ROI. The effect of the HRM indices on ROI is clearly stronger in the short-term versus long-term.

FIGURE 5.13: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 OPERATING PROFIT RATE (OUTLIER EXCLUDED)
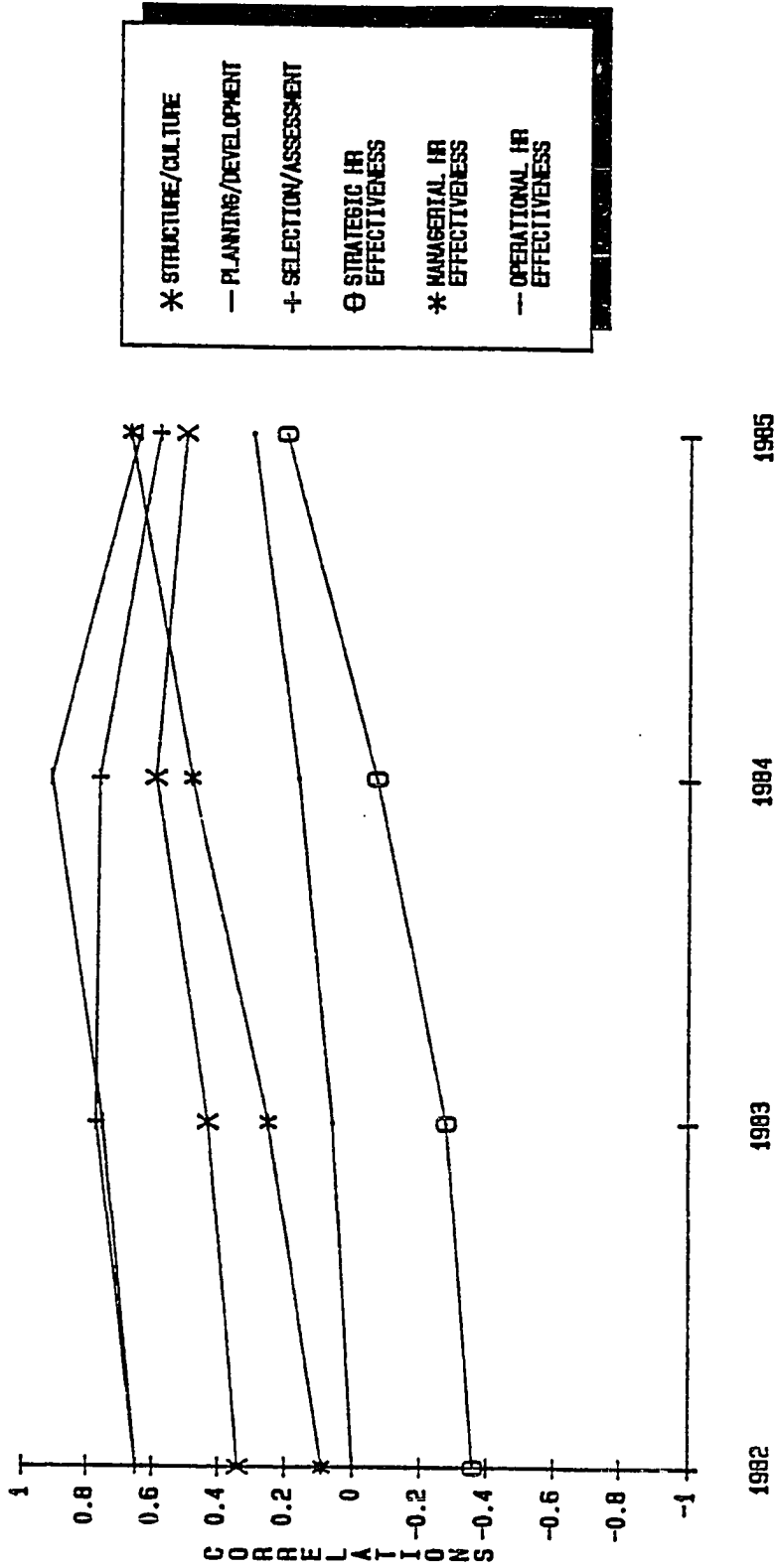
FIGURE 5.14: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 RETURN ON INVESTMENT (OUTLIER EXCLUDED)

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
θ STRATEGIC HR EFFECTIVENESS
* MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS
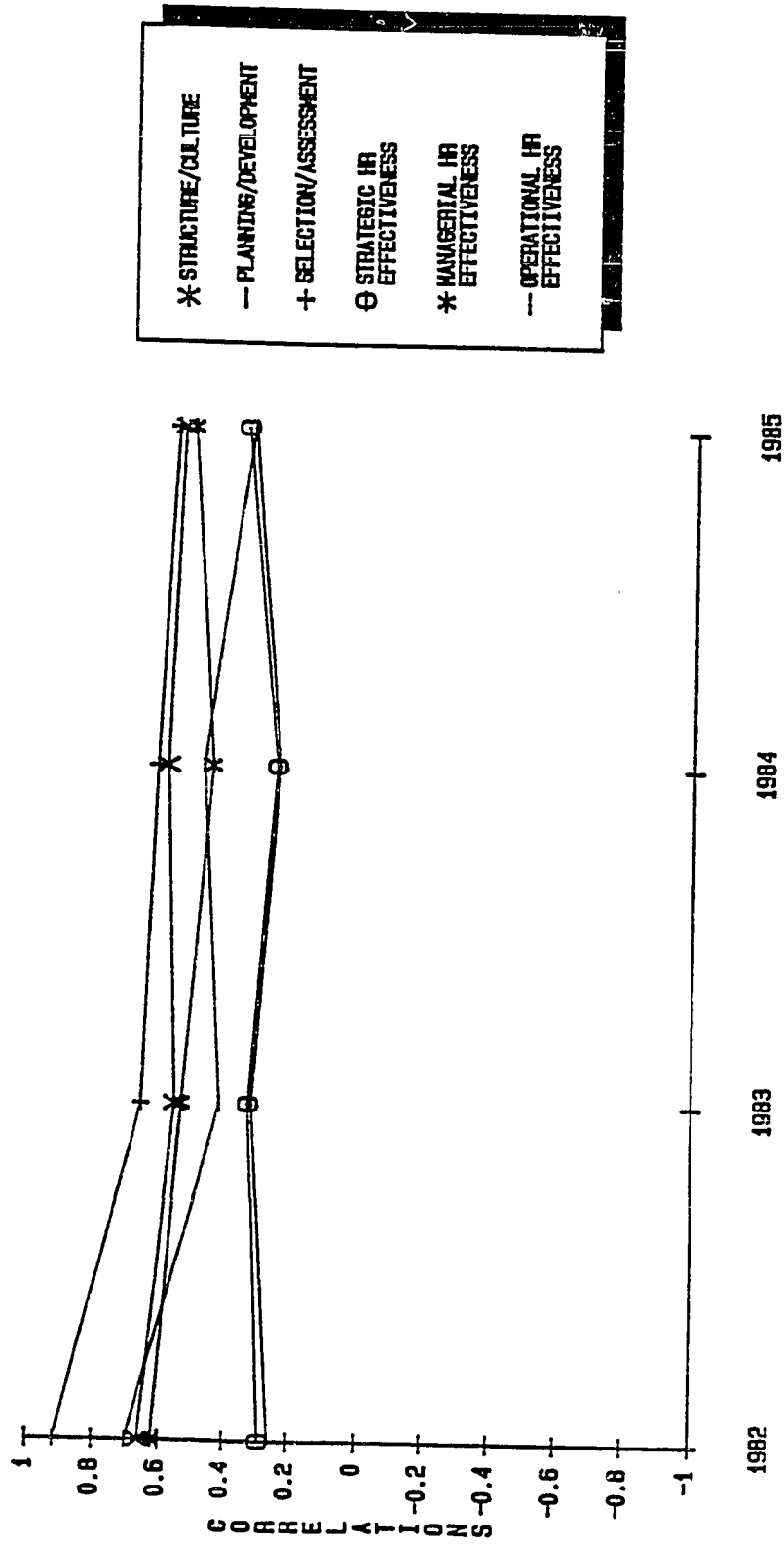
A review of the cross-lagged correlations of these relationships excluding the outlier (Table F.3, Appendix F) reveals minor changes. Again, none of the correlations approach statistical significance, suggesting that a few of the HRM indices may be useful predictors of ROI.

HRM and Average Investment Rate. Removal of the outlier has also resulted in doubling the number of significant correlations between the 1982 HRM indices and Average Investment Rate. The plots of these correlations, which are mostly negative, are portrayed in Figure 5.15. Structure/Culture now has a significant concurrent relationship with 1982 Average Investment Rate; Planning/Development has a consistently strong relationship with the 1982 through 1984 performance measure, and Selection/Assessment now is significantly correlated with the 1984 measure. None of the cross-lagged correlations approach significance (Table F.4, Appendix F) indicating that there is a strong unidirectional relationship of the three strategic HRM indices to Average Investment Rate.

Correlations between HRM and Productivity

HRM and Sales to Pay. Eliminating the outlier has very little impact on the cross-sectional and lagged correlations of the HRM indices to three of the five productivity measures: Sales to Pay, Sales per Employee, and Value-Added Sales per Employee (Tables F.5 and F.6, Appendix F, and Figure 5.17). However, four of the cross-lagged correlations of the 1983-1985 Sales to Pay productivity

FIGURE 5.15: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 AVERAGE INVESTMENT RATE (OUTLIER EXCLUDED)

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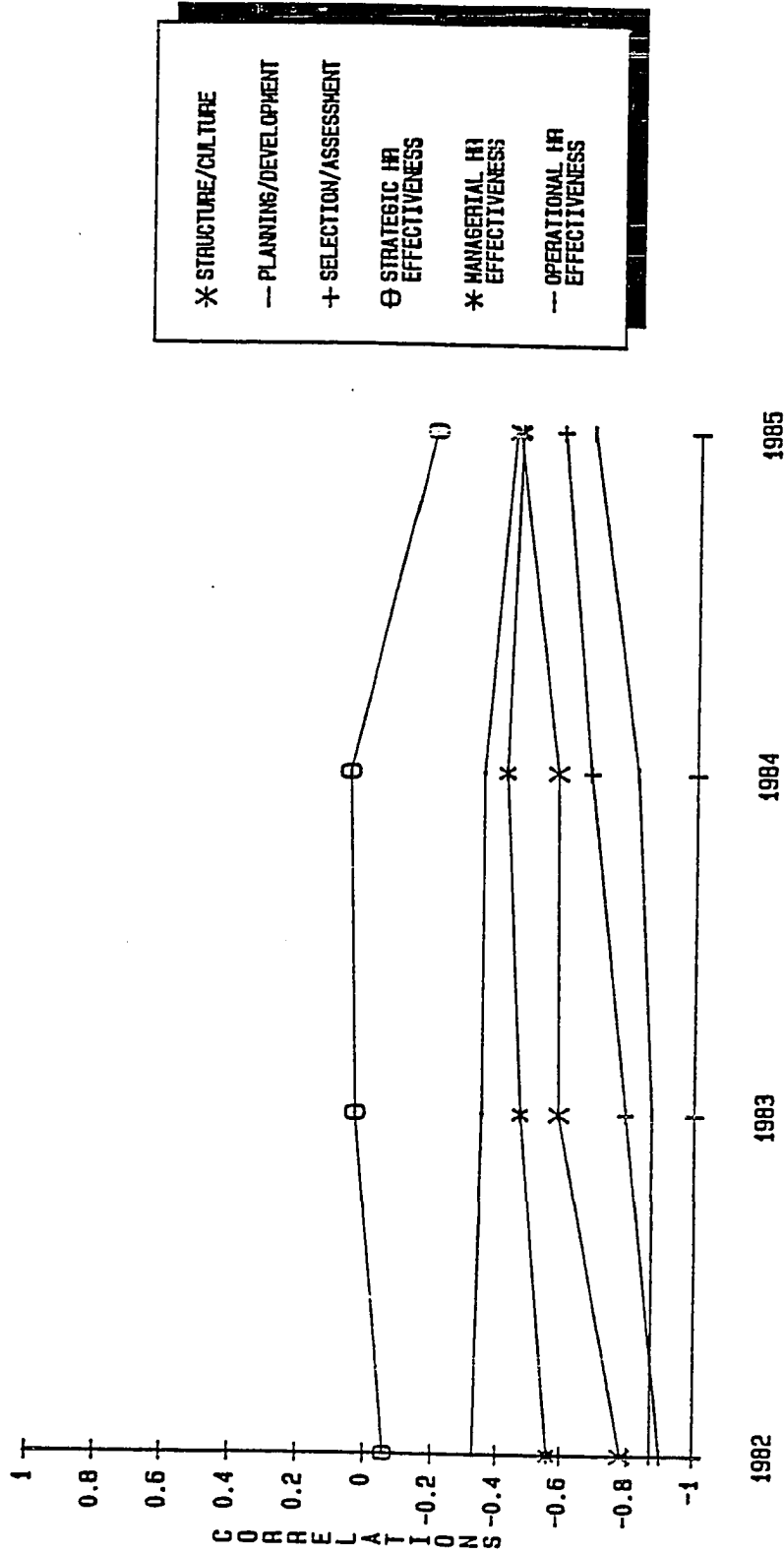
FIGURE 5.16: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 AVERAGE INVESTMENT RATE (OUTLIER EXCLUDED)

Legend:
* STRUCTURE/CULTURE
— PLANNING/DEVELOPMENT
+ SELECTION/ASSESSMENT
θ STRATEGIC HR EFFECTIVENESS
* MANAGERIAL HR EFFECTIVENESS
— OPERATIONAL HR EFFECTIVENESS
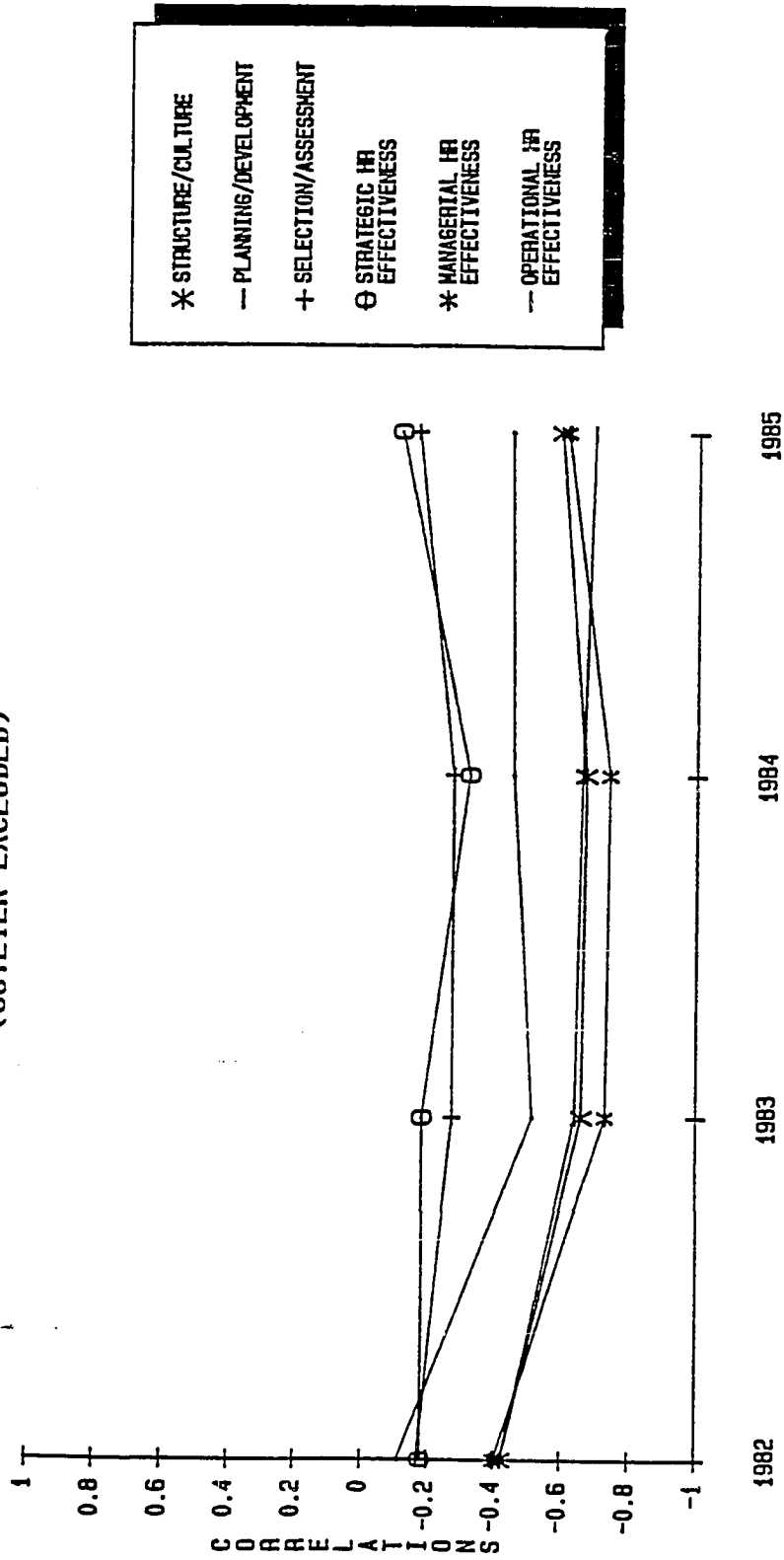
FIGURE 5.17: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES
AND 1982-1985 VALUE-ADDED SALES PER EMPLOYEE (OUTLIER EXCLUDED)
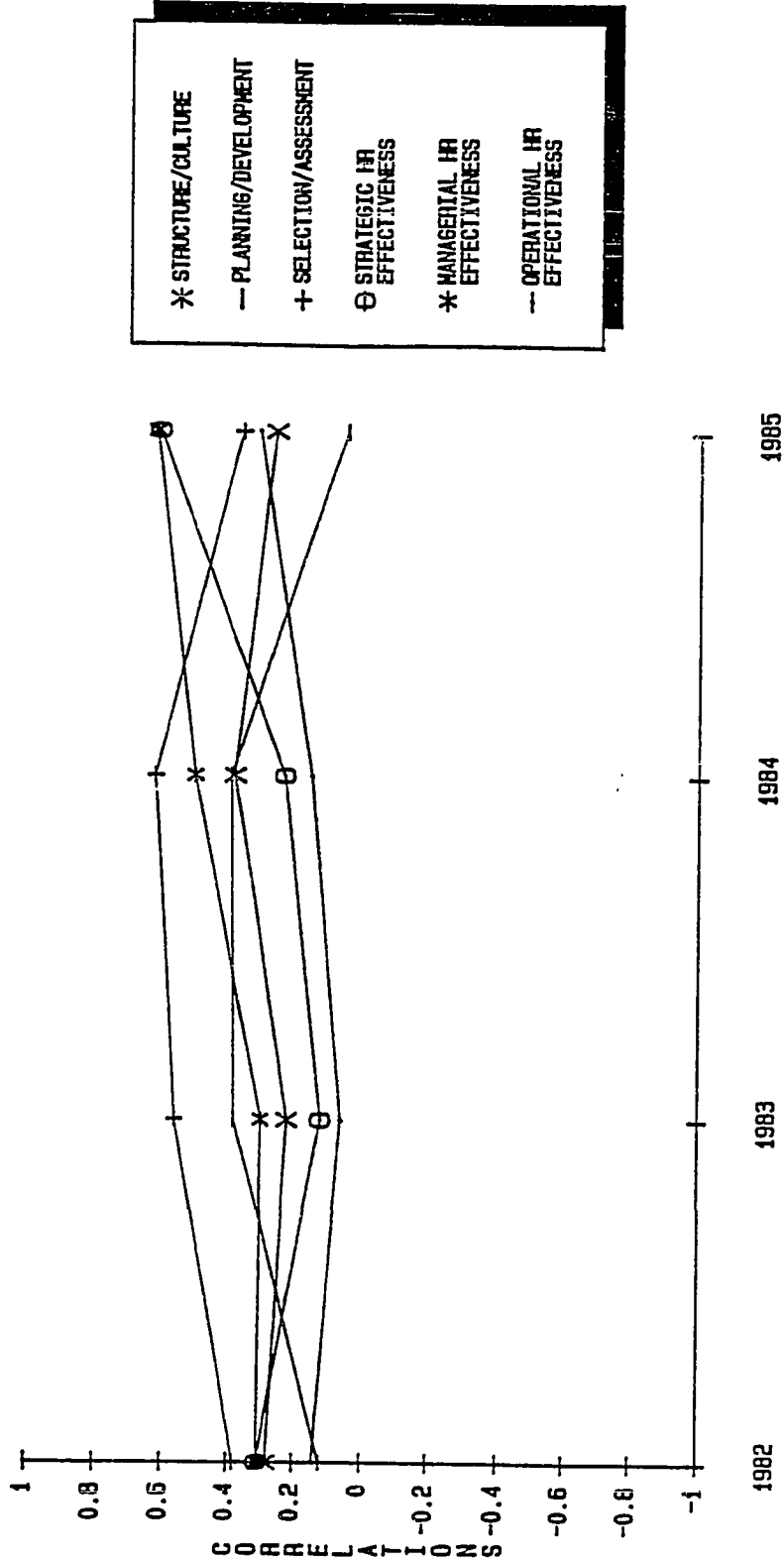
measures to Structure/Culture (1984), Planning/Development (1985), and Managerial level HR effectiveness become significant. These relationships, all of which are negative, are depicted in Figure 5.16. As is evident, the correlational plots for the indices are fairly stable, adding support to the contention that perhaps this productivity measure does impact HRM.

None of the cross-lagged correlations of Sales per Employee and Value-Added Sales per Employee to the HRM indices become significant, though a few do approach the significance threshold. These include 1985 Sales per Employee and Planning/Development, and 1985 Value-Added Sales per Employee and Operational level HR effectiveness.

HRM and Gross Inventory Rate. Figure 5.18 illustrates the correlations of the 1982 HRM variables to Gross Inventory Rate with the outlier excluded. The pattern of these plots is also similar to the plots for the total sample. However, five more relationships become significant. Both Selection/Assessment and Managerial level HR effectiveness now are strongly correlated with 1982-1984 Gross Inventory Rate. In addition, Operational level HR effectiveness has a significant relationship with the 1982 and 1985 measures, and a weak relationship with the 1983 and 1984 measures that approaches significance.

Not to be overlooked is evidence of reciprocal causality, as indicated by the cross-lagged correlations plotted in Figure 5.19. The 1982 Gross Inventory Rate

FIGURE 5.18: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES AND 1982-1985 GROSS INVENTORY RATE (OUTLIER EXCLUDED)
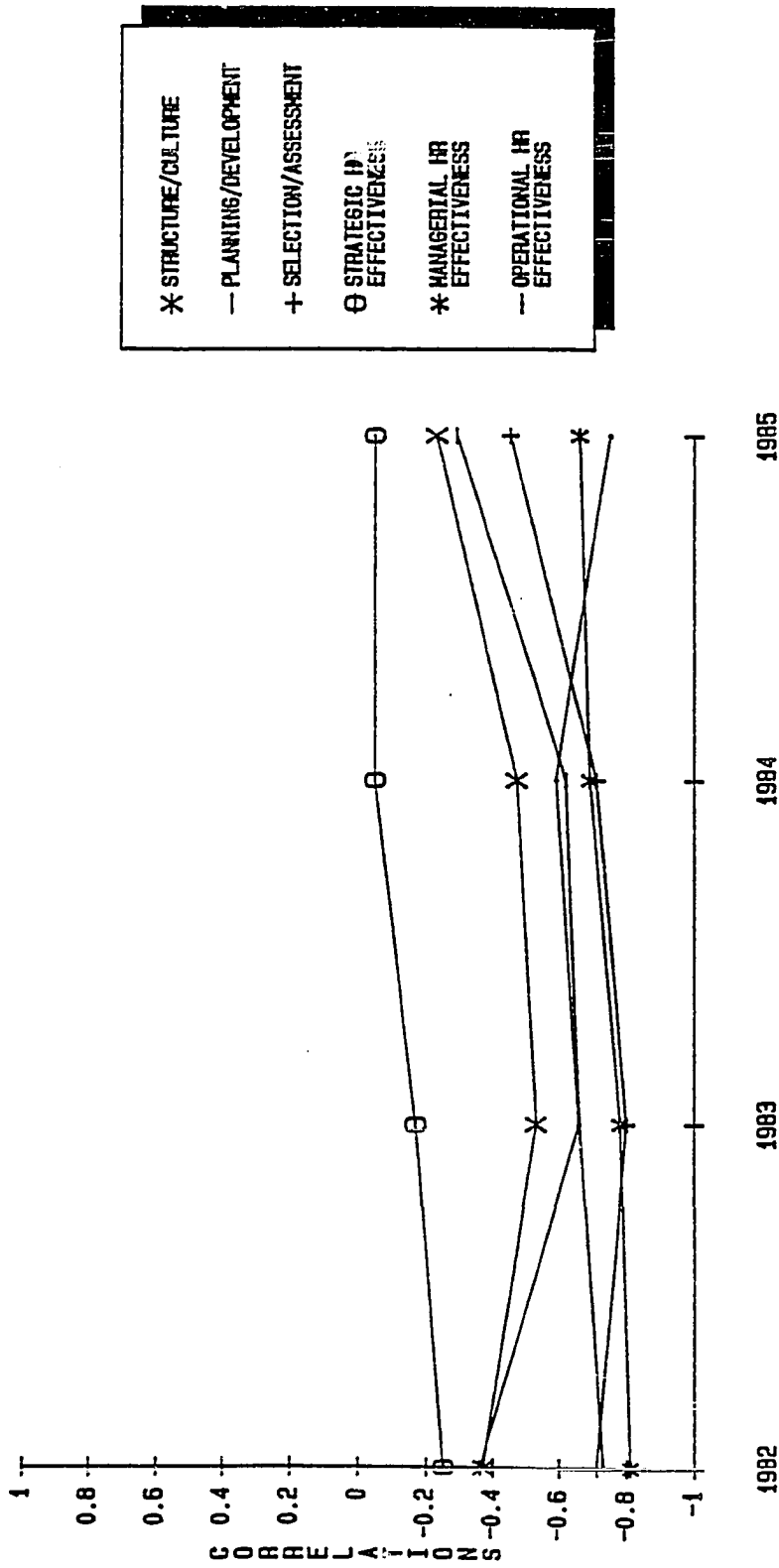
FIGURE 5.19: PEARSON CORRELATIONS BETWEEN 1985 HRM INDICES
AND 1982-1985 GROSS INVENTORY RATE (OUTLIER EXCLUDED)
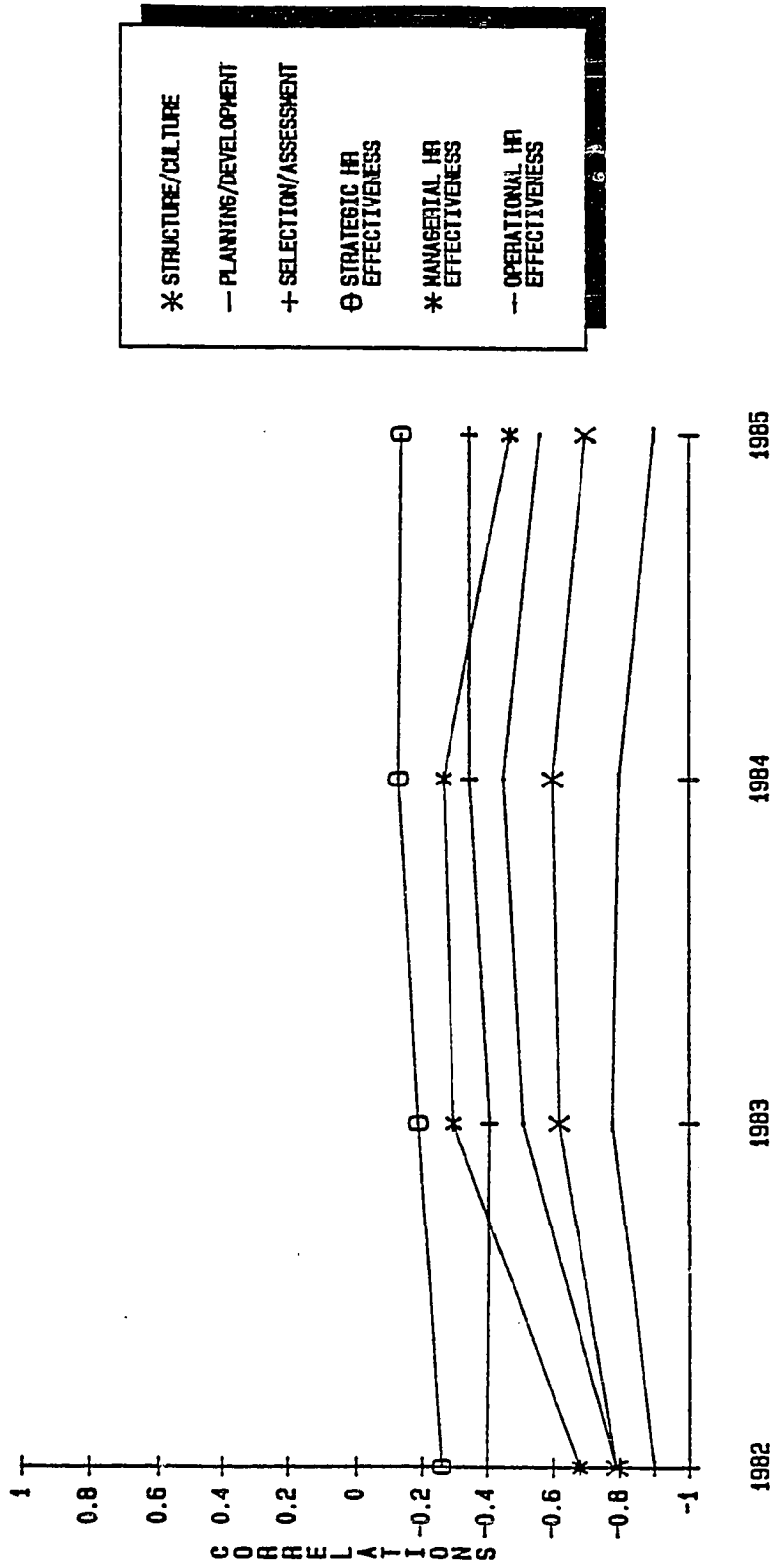
measure has a strong relationship with 1985 Structure/Culture, Managerial level HR effectiveness, and Operational level HR effectiveness. In addition, the 1982-1985 measures are very strongly correlated with 1985 Planning/Development. Thus, 1982-1985 Gross Inventory Rate may be a useful predictor of Planning/Development, whereas 1982 Selection/Assessment and Managerial level HR effectiveness are potentially useful predictors of 1982-1984 Gross Inventory Rate.

HRM and Scrap/Rework Rate. Excluding the outlier also causes a few of the lagged correlations between the HRM indices and Scrap/Rework Rate to become significant. As will be recalled, none of the correlations with the total sample were significant. Figure 5.20 illustrates these plots. Structure/Culture has a strong relationship with the 1985 measure, and weaker relationships (though approaching significance) with the 1983 and 1984 measures. In addition, Managerial level HR effectiveness is now strongly correlated with the 1984 and 1985 measures. Relationships with a few of the Selection/Assessment and Operational level HR effectiveness variables also approach, though do not reach significance.

More of the cross-lagged correlations of the 1982-1985 Scrap/Rework Rate measures to the 1985 HRM indices also reach statistical significance. Figure 5.21 portrays these results. Planning/Development and Managerial level HR effectiveness have a strong relationship with the 1984

FIGURE 5.20: PEARSON CORRELATIONS BETWEEN 1982 HRM INDICES
AND 1982-1985 SCRAP/REWORK RATE (OUTLIER EXCLUDED)

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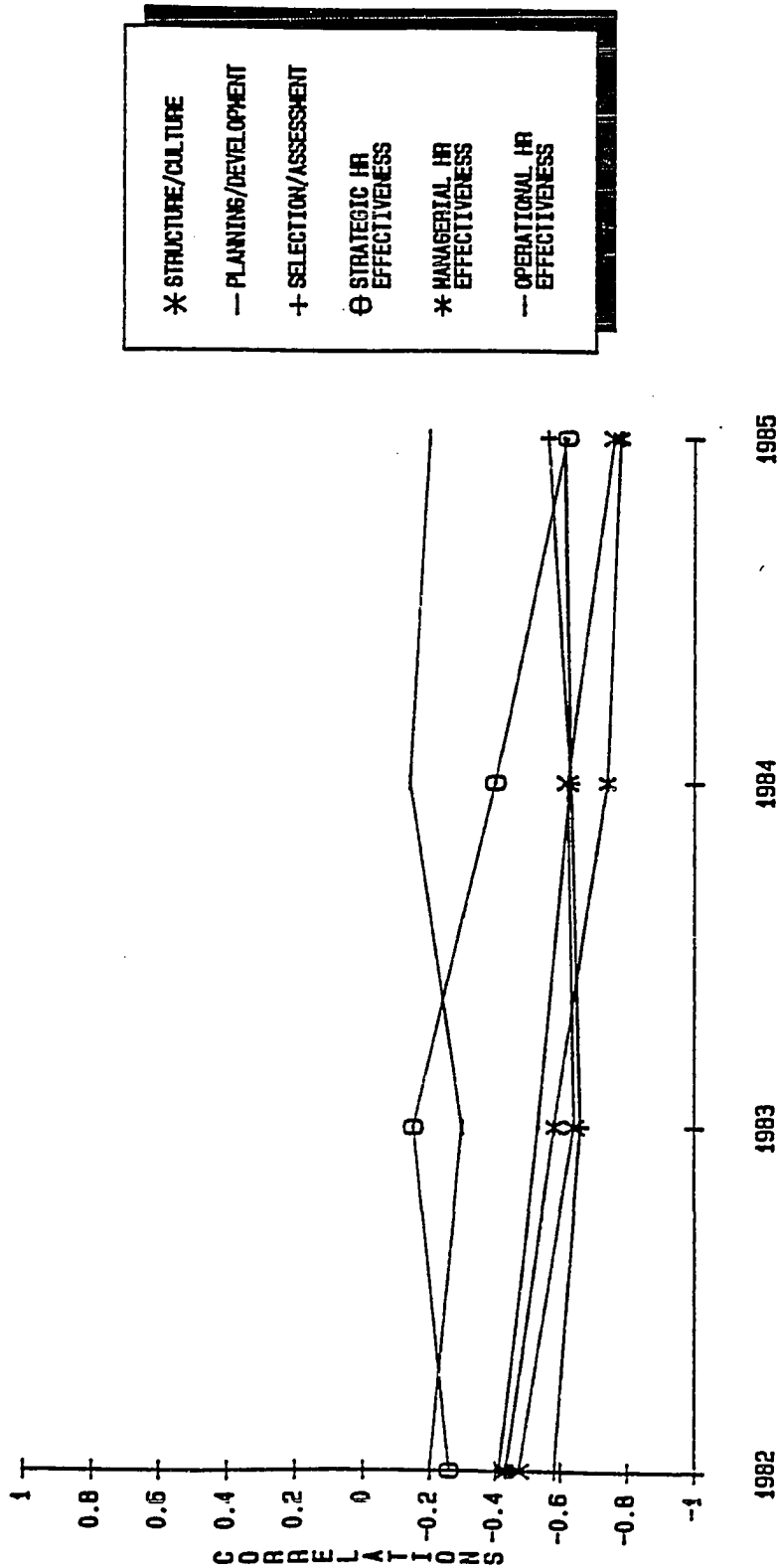
FIGURE 5.21: PEARSON CORRELATIONS BETWEEN 1985 IIRM INDICES AND 1982-1985 SCRAP/REWORK RATE (OUTLIER EXCLUDED)
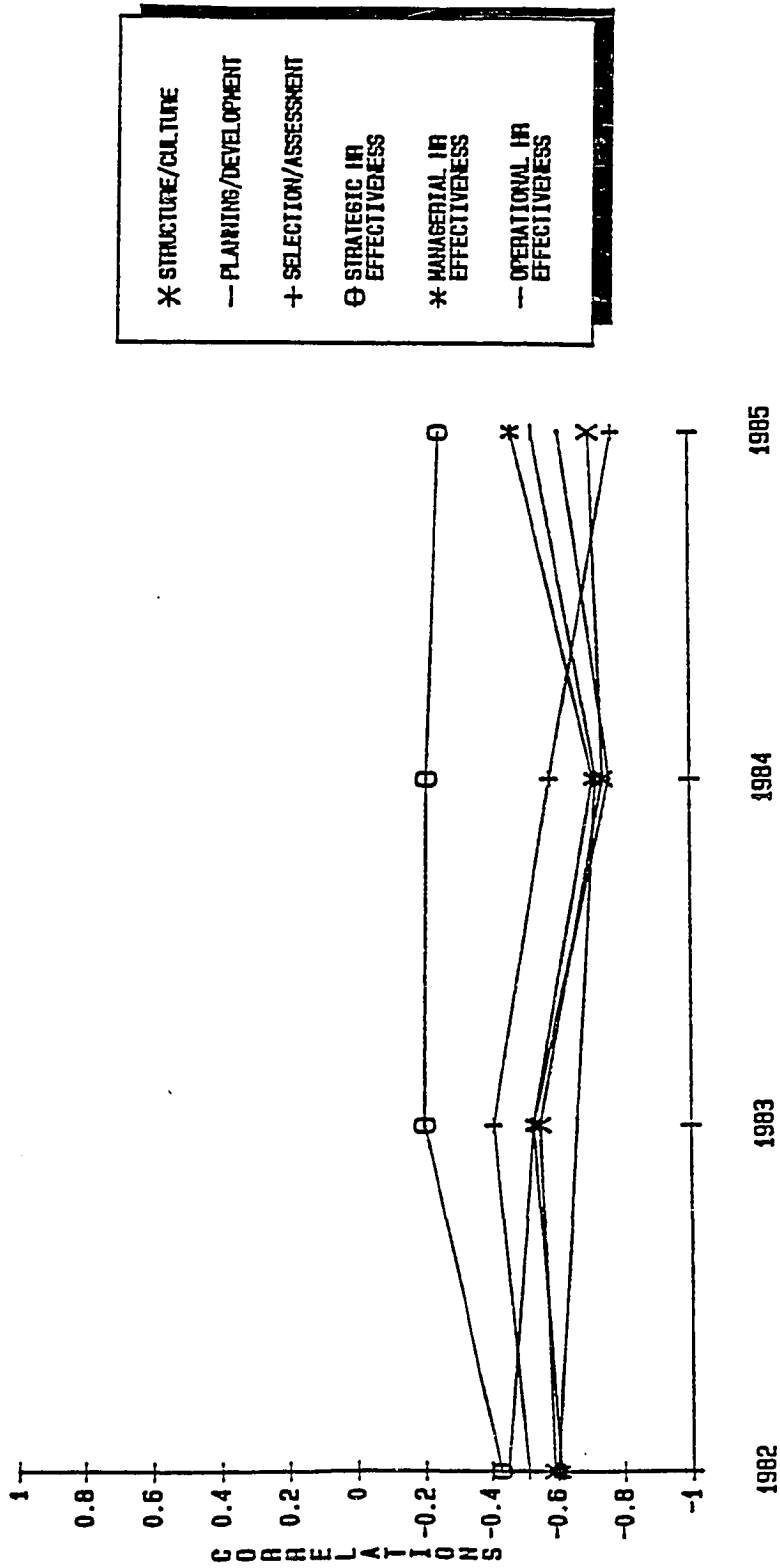
measure, and Selection/Assessment is strongly correlated with the 1985 measure. Evidence of reciprocal causality also is present as Structure/Culture has a strong relationship with the 1984-1985 measures and Managerial level HR effectiveness is significantly correlated with 1984 Scrap/Rework Rate.

Comparative Longitudinal Assessment of the Two Correlational Analyses: An Overview of the 1982-1985 Results

Thus far, this chapter has demonstrated a substantial degree of predictive validity for several of the HRM indices, indicating that these measures in the aggregate seem to hold promise as useful predictors of several of the financial performance and productivity measures over time. In this section of the chapter, key findings are summarized and reviewed. To facilitate the interpretation of the overall results, the cross-sectional, lagged, and cross-lagged relationships between these variables are presented by level of significance in the form of tables.

Table 5.2 identifies the cross-sectional and lagged relationships between the HRM indices and financial performance for the total sample of the ECG business units. Several interesting features of these analyses are apparent. First, only two of the six HRM indices seem to be useful predictors of the concurrent and short-term financial performance measures. These are Planning/Development and Selection/Assessment, which have weak to strong relationships with 1982-1983 Operating Profit, ROI, and

Average Investment Rate. None of the three strategic HRM indices, though, have a strong relationship with ROI from 1982 through 1984.

Second, the HR effectiveness indices as a group are not significantly related to any of the concurrent or short-term financial performance measures. Rather, they appear to be more useful predictors of mid- and long-term performance. Strategic, Managerial, and Operational level HR effectiveness have weak to moderate relationships with 1984-1985 Revenue Growth and ROI, and nonsignificant relationships with Operating Profit and Average Investment Rate at any point during the four-year timespan. Again, none of these relationships is highly significant.

As Table 5.3 indicates, most of the significant cross-lagged relationships are between 1983 Revenue Growth and four of the 1985 HRM indices. In particular, the correlations of 1982 Revenue Growth to Managerial and Operational level HR effectiveness highly significant. Otherwise, the few noteworthy relationships between Revenue Growth and the remaining HRM indices are weak to moderate in strength. These results add credence to the argument that the causal direction of the relationship between these variables largely is from the HRM indices to the financial performance measures. The only exception pertains to Revenue Growth. The 1982 measure is a strong predictor of Managerial and Operational level HR effectiveness, and a weak to moderate predictor of Planning/Development and

Table 5.2 Summary of the Cross-Sectional and Lagged Relationships of the 1982 HRM Indices to 1982-1985 Financial Performance (Total Sample)[1]

Index:	1982				1983				1984				1985			
	RG	OP	ROI	IR	RG	OP	ROI	IR	RG	OP	ROI	IR	RG	OP	ROI	IR
STRCUL																
PLADEV	W+	W+		M-	M+			M-	S+		W-		W+			
SELASS	W+	S+		M-	M+	M+		M-	M+							
STREFF									W+				W+			
MGREFF									M+		W-				W-	
OPEFF									M+		W-		M+		W-	

Table 5.3 Summary of the Cross-Lagged Relationships of 1982-1985 Financial Performance to the 1985 HRM Indices (Total Sample)

Index:	1982				1983				1984				1985			
	RG	OP	ROI	IR	RG	OP	ROI	IR	RG	OP	ROI	IR	RG	OP	ROI	IR
STRCUL					M-								M+			
PLADEV					W-											
SELASS																
STREFF																
MGREFF	M+				VS-								M+			
OPEFF					VS-				W+							

1 The labels in the table are abbreviations for the six HRM indices and four financial performance measures. The letters designate the strength of the correlations between the variables.
Keys: +/- = positive or negative relationship

W=weak	(.05<p<.10)	RG=Revenue Growth
M=moderate	(.01<p<.05)	OP=Operating Profit
S=strong	(.001<p<.01)	ROI=Return on Investment
VS=very strong	(p<.001)	IR=Average Investment Rate

Structure/Culture.

Summary results from the correlational analyses with the outlier excluded are presented in Table 5.4. As indicated above, eliminating the outlier causes several more significant relationships to emerge from this series of correlational analyses. It is interesting to note, however, that there is a decrease in the number of significant relationships between the HR effectiveness indices and the 1982-1985 financial performance measures. In particular, the weak relationship between Strategic level HR effectiveness and Revenue Growth becomes nonsignificant. This is more than offset by a sizable increase in the number and strength of the significant relationships between the three strategic HRM indices and the financial performance measures.

The strategic HRM indices (Structure/Culture, Planning/Development, and Selection/Assessment) now appear to be useful predictors of concurrent, short-, and mid-term financial performance, though their long-term relationship with these measures clearly varies in strength. The correlations of the HRM indices to Revenue Growth, though, continue to be weak, and the improvement in the strength of their relationships with ROI is marginal.

Also interesting to note is the relatively small change in the cross-lagged relationships between these variables, depicted in Table 5.5. The 1982 Revenue Growth measure maintains its highly significant effect on Managerial and

Table 5.4   Summary of the Cross-Sectional and Lagged Relationships of the 1982 HRM Indices to 1982 -1985 Financial Performance (Outlier Excluded)[2]

Index:	1982 RG	OP	ROI	IR	1983 RG	OP	ROI	IR	1984 RG	OP	ROI	IR	1985 RG	OP	ROI	IR
STRCUL		W+	M-					W-	W+		W+	W-				
PLADEV	W-	W+	M+	S-		M+		S-	VS+			S-	W-	W+		M-
SELASS		W+	VS+	S-		M+	W+	S-		M+	W+	M-		W+		W-
STREFF																
MGREFF		W+			W-				W+					M+		
OPEFF					W-								M+			

Table 5.5   Summary of the Cross-Lagged Relationships of 1982-1985 Financial Performance to the 1985 HRM Indices (Outlier Excluded)

Index:	1982 RG	OP	ROI	IR	1983 RG	OP	ROI	IR	1984 RG	OP	ROI	IR	1985 RG	OP	ROI	IR
STRCUL					M-								W+			
PLADEV					W-											
SELASS																
STREFF																
MGREFF	W+				VS-								M+			
OPEFF					VS-				M+							

2   The labels in the table are abbreviations for the six HRM indices and four financial performance measures.   The letters designate the strength of the correlations between the variables.

Keys: +/- = positive or negative relationship

W=weak	(.05<p<.10)	RG=Revenue Growth
M=moderate	(.01<p<.05)	OP=Operating Profit
S=strong	(.001<p<.01)	ROI=Return on Investment
VS=very strong	(p<.001)	IR=Average Investment Rate

Operational level HR effectiveness, the remaining few relationships change very little in strength, and there is no change in the number of significant correlations. Thus, in ECG's case, removing the outlier adds support to the assertion that the nature and direction of the relationship between these variables is such that the strategic HRM indices are useful predictors of three of the four financial performance measures across time. However, the direction of causality between Revenue Growth and the two effectiveness indices, as indicated by these analyses, still appears to be reciprocal.

Tables 5.6 and 5.7 summarize the strength of the relationships between the HRM indices and the productivity measures. There are relatively fewer significant cross-sectional and lagged relationships between these variables compared to those observed between the HRM indices and the financial performance measures above. Seven of the ten relationships depicted in Table 5.6 involve 1982-1984 Gross Inventory Rate and three of the HRM indices. Of these three indices, Selection/Assessment is the strongest (and most prominent) predictor, followed by Planning/Development, then Managerial level HR effectiveness.

These results suggest that how employees are selected and appraised for attaining strategic objectives is related to Gross Inventory Rate, which, in view of ECG's concerted efforts to manage its assets, is a reasonable interpretation.

It is important to note that the frequency and magnitude of the cross-lagged correlations of the 1982-1985 productivity measures to the 1985 HRM indices are greater than those of the cross-sectional and lagged correlations. These results are illustrated in Table 5.7. Again, many of these relationships involve Gross Inventory Rate, which suggests that the direction of causality between these variables is reciprocal. The remaining few relationships largely involve Sales to Pay and three of the HRM indices, particularly Planning/Development.

Table 5.8 presents the results of the analyses conducted with the outlier eliminated. As is evident, several more of the relationships between these variables become significant. Similar to the relationships observed for the total ECG sample, most involve the 1982-1985 Gross Inventory Rate and Scrap/Rework Rate measures. The strongest predictors are Managerial level HR effectiveness and Selection/Assessment of 1982 and 1983 Gross Inventory Rate respectively. No relationships of the 1982 HRM indices to Sales to Pay or Sales per Employee become significant, and the few relationships between the HRM indices and 1984-1985 Value-Added Sales per Employee are weak.

The cross-lagged relationships of the 1982-1985 productivity measures to the 1985 HRM indices also increase in frequency and magnitude. These are illustrated in Table 5.9. Again, there is evidence of reciprocal causality for both the Gross Inventory Rate and Scrap/Rework indices. The

Table 5.6   Summary of the Cross-Sectional and Lagged Relationships of the 1982 HRM Indices to Productivity (Total Sample)[3]

Index:	1982					1983					1984					1985				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL																		W−		
PLADEV								M−					W−							
SELASS			M−					S−	W−			W+	M−							
STREFF																				
MGREFF			W−					W−												
OPEFF																				

Table 5.7   Summary of the Cross-Lagged Relationships of 1982-1985 Productivity to the 1985 HRM Indices (Total Sample)

Index:	1982					1983					1984					1985				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL		M−									W−									
PLADEV		S−				W−		M−			W−		M−	W−		W−		S−		
SELASS																				M−
STREFF																				
MGREFF											W−									
OPEFF		M−																	W+	

3 The numbers 1-5 refer to the five productivity measures and the letters designate the strength of the correlations between the variables.

Keys: +/− = positive or negative relationship

W=weak	(.05<p<.10)	1=Sales to Pay
M=moderate	(.01<p<.05)	2=Sales per Employee
S=strong	(.001<p<.01)	3=Value-Added Sales per
VS=very		Employee
strong	(p<.001)	4=Gross Inventory Rate
		5=Scrap/Rework Rate

Table 5.8 **Summary of the Cross-Sectional and Lagged Relationships of the 1982 HRM Indices to 1982-1985 Productivity (Outlier Excluded)[4]**

Index:	1982					1983					1984					1985				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL								W-					W-						M-	
PLADEV							W-					W-								
SELASS			M-	W-				S-	W-			W+	M-	W-						
STREFF																	W+		W-	
MGREFF		S-					M-	W-					M-	M-		W+	W-	M-		
OPEFF		M-					W-					W-	W-					M-	W-	

Table 5.9 **Summary of the Cross-Lagged Relationships of 1982-1985 Productivity to 1985 HRM Indices (Outlier Excluded)**

Index:	1982					1983					1984					1985				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL			M-	W-		W-		W-			M-			W-	M-	W-			M-	M-
PLADEV			VS-	W-		W-		M-	W-		W-			S-	M-	M-	W-		S-	
SELASS														W-						M-
STREFF																				
MGREFF			M-	W-		M-					M-			M-		W-				
OPEFF			M-											M-				W+		W-

4 The numbers 1-5 refer to the five productivity measures and the letters designate the strength of the correlations between the variables.

Keys: +/- = positive or negative relationship

W=weak	(.05<p<.10)	1=Sales to Pay
M=moderate	(.01<p<.05)	2=Sales per Employee
S=strong	(.001<p<.01)	3=Value-Added Sales per
VS=very		Employee
strong	(p<.001)	4=Gross Inventory Rate
		5=Scrap/Rework Rate

1982 Gross Inventory Rate measure is a particularly strong predictor of 1985 Planning/Development, as are the 1984-1985 measures. Also worth noting is the cross-lagged relationship of 1983-1985 Sales to Pay to three of the 1985 HRM indices: Structure/Culture, Planning/Development, and Managerial HR effectiveness. The correlations between these variables are weak to moderate in strength.

Summary

A key objective of this chapter was to evaluate the predictive validity of the six HRM indices at the business unit level through an assessment of their utility as predictors of the financial performance and productivity variables. Two series of correlational analyses were reviewed: one including the total sample of ten 1982 and eleven 1985 ECG business units, and the second analyses excluding an outlier with extraordinary financial performance results. The second series of correlational analyses is instrumental in helping separate those findings that may be more tenuous from those that are more highly reliable.

The correlations for both sets of analyses were evaluated in two ways: (1) through a review of the plots for each set of relationships to examine the magnitude and direction of the relationships between the variables, and (2) through an examination of the strength of the pattern of relationships of the variables across time to identify which among the variables are better concurrent, short-term, mid-

term, and long-term predictors. The HRM indices fulfill one important criteria of predictive validity in this case--usefulness in determining ECG's financial performance and productivity.

In general, compared to the HR Effectiveness indices, the HR-Strategy Linkage indices demonstrate greater potential as useful predictors of financial performance, particularly short- to mid-term. The HR Effectiveness indices, in turn, exhibit a bit more potential as predictors of productivity than do the HR-Strategy Linkage indices, particularly long-term.

The HRM indices overall, though, have few strong relationships with the productivity measures. In fact, more and stronger relationships are apparent in the opposite direction, implying that the productivity measures may have greater potential as predictors of the HRM indices. There is strong evidence, too, of reciprocal causality between these variables.

A second objective of this chapter was to test whether there are significant differences in the mean scores between the business units. The analyses of variance conducted in an earlier section of this chapter indicate that individual level data can be appropriately substituted for business unit level data. The encouraging results of these analyses allow for the use of more powerful statistical tests at the individual level of analysis--the focal point of Chapter Seven, to which I now turn.

CHAPTER SIX

AN EXAMINATION OF THE RELATIONSHIP BETWEEN HUMAN RESOURCE
MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN ECG AT THE
INDIVIDUAL LEVEL OF ANALYSIS

Nothing is worth doing unless the
consequences may be serious...

George Bernard Shaw

The leap from data to discovery
eludes specification.

Miriam Shapiro Grosof
and Hyman Sardy
A Research Primer for
the Social Sciences

Introduction

The results of the regression analyses conducted to examine the predictive validity of the HRM indices at the individual level of analysis are the focal point of this chapter. As considerably more variance is introduced at the individual level compared to the business unit level, it is expected that fewer significant relationships will result. However, the regression analyses have advantages over the correlational analyses. From a comparative standpoint, beyond examining strengths and patterns of relationships, useful predictors of the dependent variables under study can be identified. The issue of causality can also be addressed, though again, conclusions drawn still are

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tentative. In brief, the regression analyses have greater utility for examining the predictive capability of the HRM indices and organizational performance measures that are central to this research.

Conducting these analyses raises several questions relevant to this research. Given that the results of the correlational analyses show that there are generally more and stronger relationships of the HRM indices to the performance measures than the reverse, will the results of the regression analyses also find the HRM indices to be more useful, if not stronger predictors of performance? What patterns of relationships between these variables will emerge across time?

To address these questions, the cross-sectional regression analyses of the effects of the HRM indices on ECG's 1982 and 1985 financial performance and productivity measures are first evaluated in this chapter. These are followed by an examination of the effects of the 1982 HRM indices on 1983-1985 organizational performance, or what was described in Chapter Five as the lagged analyses. The final set of regression analyses examines the cross-lagged relationships--those of the 1982-1985 financial performance and productivity measures to the 1985 HRM indices. Following this series of analyses, a detailed longitudinal assessment of the relationships between these variables is presented. The chapter concludes with a summary and brief review of the key findings.

Methodologically, I chose standardized multiple regression analyses over hierarchical or step-wise techniques as no specific variable or variables were favored over the remainder in the equation. Only complete cases were included in these analyses. Again, respondents without business unit affiliations (primarily Corporate and Group staff members) are excluded from these analyses.

In effect, the number of complete cases available for these analyses was reduced substantially from 110 to 66 respondents for Wave 1, and from 146 to 111 respondents for Wave 2. In order to preserve those that remained from further attrition without adversely affecting the findings, the outlier was retained in cases where its performance results were in line with the other ECG business units.

ROI was the only one of the outlier's performance measures that differed substantially enough from those of the remaining ECG business units to warrant special attention. Thus, to avoid unjustified conclusions, I eliminated the outlier from the lagged regression analyses where ROI is a dependent variable, and from the cross-lagged analyses involving the financial performance measures for the years where it is abnormally high.

The numerous tables developed to illustrate the results of these analyses are located in the appendices. The results of the cross-sectional and lagged analyses are in Appendix G; those of the cross-lagged analyses are in Appendix H. Additional figures and tables will be used

throughout the chapter, however, to illustrate specific relationships and patterns, as well as significant findings.

Cross-Sectional Regression Analyses

The Cross-Sectional Effects of the HRM Indices on the Financial Performance Measures: 1982 and 1985

1982 Cross-Sectional Regression Results. The results of the eight regression analyses conducted to explore the effects of the 1982 HR-Strategy Linkage and HR Effectiveness indices on the four 1982 financial performance measures are presented in Table G.1. As is evident, none of the 1982 HRM variables has a significant effect on any of the financial performance variables. Operational level HR effectiveness comes close to but falls short of serving as a useful predictor of Revenue Growth.

1985 Cross-Sectional Regression Results. According to these results, also illustrated in Table G.1, several of the 1985 HRM indices are useful predictors of 1985 financial performance. Nearly all of the significant relationships involve HR effectiveness indices. Only Managerial level HR Effectiveness has a strong effect on Revenue Growth (PERGR). Both MGREFF and OPEFF have very strong relationships with Operating Profit Rate (OPPLAN), with opposite effects.

Planning/Development is the only HR-Strategy Linkage index to have a strong effect on ROI. Strategic level HR Effectiveness, too, has a moderately strong effect on ROI. None of the HR-Strategy Linkage variables has a significant effect on Average Investment Rate (INVRAT). However, all

three HR Effectiveness variables are strong predictors of INVRAT, though again differences are apparent. Operational and Strategic level HR effectiveness have strong, inverse relationships with R&D investment in the business, whereas Managerial level HR effectiveness is positively associated with high INVRAT.

Amount of Variance Explained in Financial Performance by the 1982 and 1985 HRM Indices. These results, illustrated in Figure 6.1, reveal that the HRM indices explain nearly 10% of the variation in Revenue Growth for both years. The greatest amount of variance explained by the independent variables is in Operating Profit Rate. The six HR indices account for 12.3% of the variance for 1982, and 8.9% of the variance in the measure for 1985. The amount of variance explained in the ROI and Average Investment Rate measures also ranges from about 8 to 10%.

In summary, though none of the 1982 HR indices appear to have a significant effect on 1982 financial performance, collectively they account for a notable proportion of the variance in Revenue Growth and Operating Profit Rate. This observation, coupled with the finding that several 1985 HR indices do have a strong effect on financial performance, provides additional support for the contention that human resource management can impact the bottom line.

FIGURE 6.1: PLOT OF R-SQUARED FOR CROSS-SECTIONAL
FINANCIAL PERFORMANCE RESULTS, 1982-1985
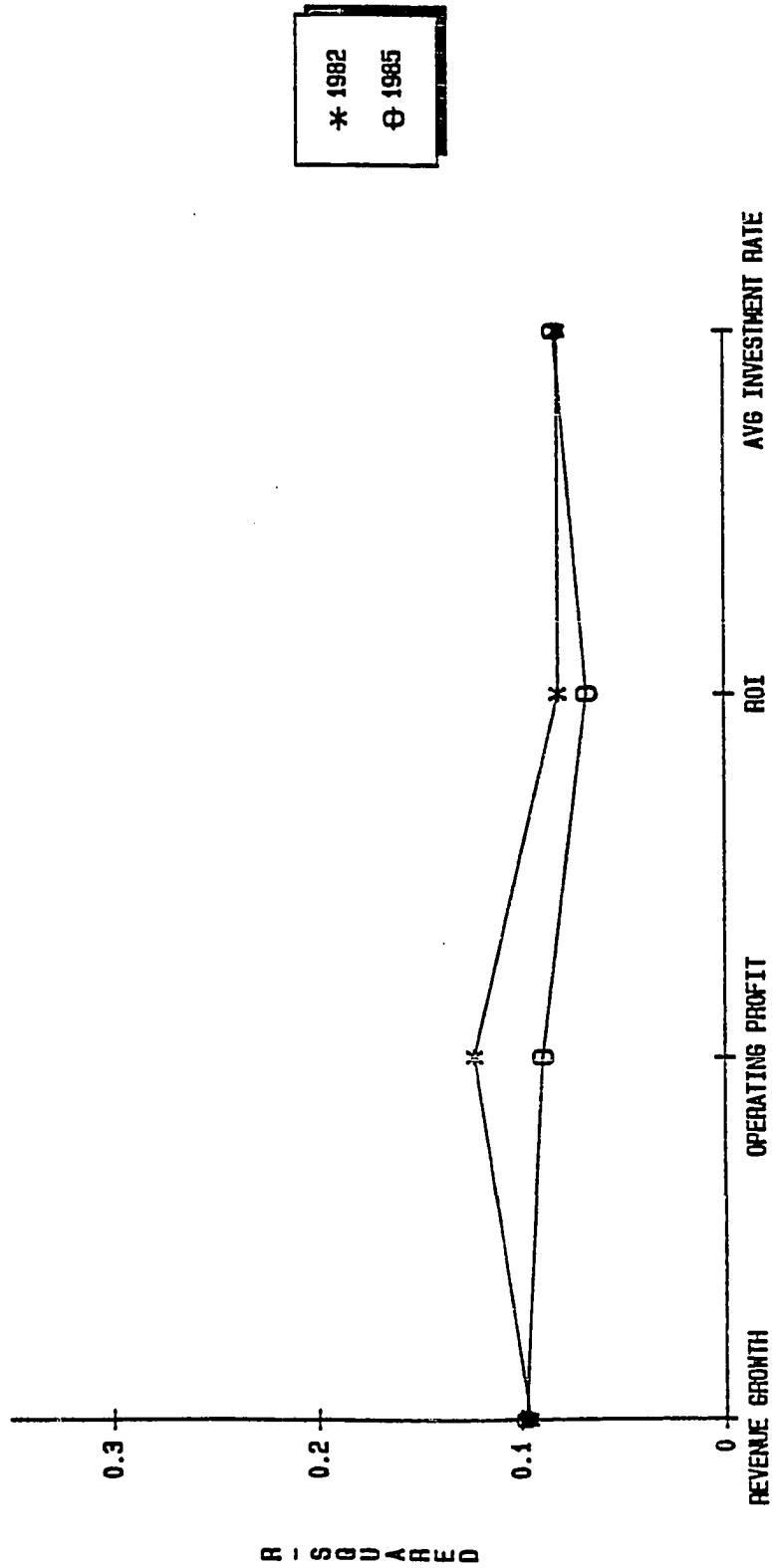
The Cross-Sectional Effects of the HRM Indices on the Productivity Measures: 1982 and 1985

The results of the ten regression analyses exploring the effects of the 1982 and 1985 HRM indices on the five productivity variables are summarized in Table G.2 Compared to the relationships between the HRM indices and financialperformance discussed above, the effects of these same independent variables on productivity are much less pronounced.

1982 Cross-Sectional Regression Results. Again, there are no significant relationships between the six indices and 1982 productivity. In a word, the 1982 HRM indices are not useful predictors of any of the five 1982 productivity measures. Strategic level HR effectiveness comes the closest to reaching statistical significance in its relationship to Value-Added Sales per Employee.

1985 Cross-Sectional Regression Results. Relatively few significant relationships also emerge from these analyses. Only two of the HRM indices appear to be useful predictors of Sales to Pay (STOPAY). Both are HR effectiveness indices, and their effects on this productivity measure are in the opposite direction. Sales to Pay has a strong, positive relationship with Strategic level HR Effectiveness and conversely, a strong negative relationship with Managerial level HR Effectiveness.

There is but one strong relationship between each of the remaining productivity measures and the HRM indices.

Sales per Employee has a significant, negative relationship with Planning/Development (PLADEV). This suggests that management development and career planning to support business strategy are associated with low Sales per Employee--a finding also supported by the interview data.

Operational level HR effectiveness is the only HRM index that has a strong positive relationship with Value-Added Sales per Employee (VADSAL), and Gross Inventory Rate (GINVNT) has an even stronger, negative association with PLADEV. One explanation for this latter result borne out by the interview data is that ECG embarked on a major asset management campaign around the 1984-1985 timeframe. More stringent management of inventory, of course, was a key part of this strategic initiative.

Finally, Selection/Assessment has a significant negative effect on Scrap/Rework Rate. This suggests that a high use of selection and appraisal of employees to support strategic objectives is associated with lower levels of scrap/rework, which was expected.

Amount of Variance Explained in Productivity by the 1982 and 1985 HRM Indices. These results are displayed in Figure 6.2. As is evident, the greatest amount of variance explained is in Gross Inventory Rate for both 1982 and 1985 (10% to 13%) followed by 1985 Scrap/Rework Rate (12.3%). These results are encouraging as they reinforce the contention that a few of the HR indices have a notable effect on these two productivity measures. By comparison,

FIGURE 6.2: PLOT OF R-SQUARED FOR CROSS-SECTIONAL PRODUCTIVITY RESULTS, 1982-1985
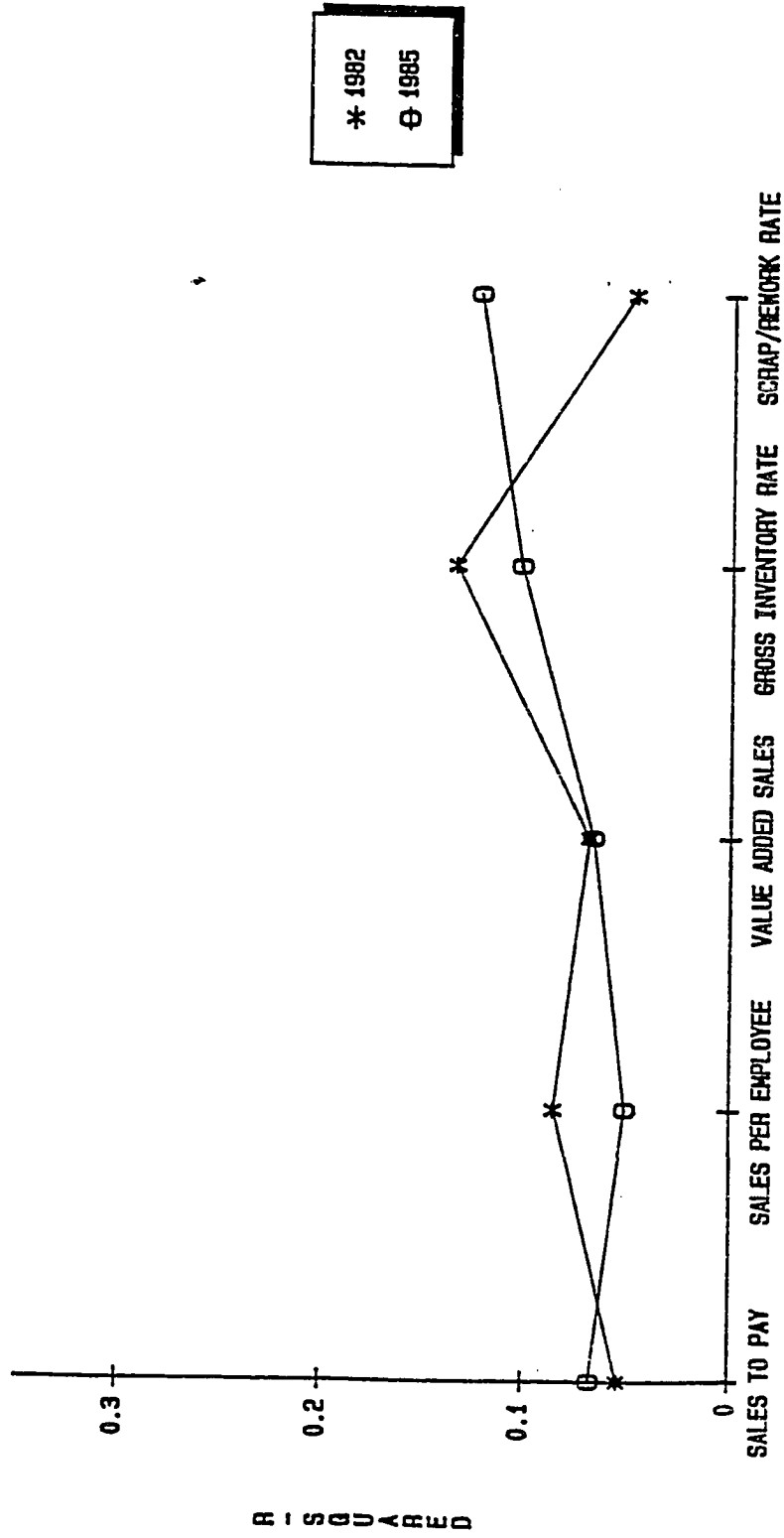
the amount of variance explained in the remaining 1982 and 1985 productivity measures by the HR indices is considerably lower, ranging from 4.7% to 8.5%.

Lagged Regression Analyses

The Effects of the 1982 HRM Indices on the 1983-1985 Financial Performance Measures

The lagged effects of the 1982 HR-Strategy Linkage and HR Effectiveness indices on each of the four financial performance and five productivity variables for 1983-1985 are examined in this section. In addition, the lagged effects of these same indices on the 1985 HRM indices are also evaluated. Theoretically, if the HRM indices are useful predictors of organizational performance, then more significant lagged effects should be evident than there were cross-sectional effects. Just as the payoff from formulating and implementing strategy generally tends to be medium- to long-term rather than immediate or short-term, so, too, should be the effect of strategic human resource management on performance.

For each dependent variable, the significant HRM predictors are first identified. Then the emergent pattern of relationships is discussed. This is followed by a review of the amount of variance explained by the set of HRM indices. All of the tables illustrating the regression results from the lagged analyses are located in Appendix G. For comparative purposes, the cross-sectional (1982) results are also provided in the tables.

<u>Lagged Effects of the 1982 HRM Indices on 1983-1985 Revenue Growth</u>. Table G.3 presents these results. As expected, stronger lagged relationships between the 1982 HRM indices and 1983-1985 Revenue Growth emerged from the regression analyses compared to the cross-sectional results. Variations in the pattern of these relationships are also evident.

In brief, Planning/Development has a strong positive relationship with the 1983 measure and a strong negative relationship with the 1985 measure. The relationship of Strategic level HR effectiveness to Revenue Growth follows the opposite pattern--strong, negative effects in 1983, followed by strong, positive effects in 1985. The pattern of relationships between Operational HR Effectiveness and Revenue Growth is also mixed. OPEFF has a weak, but borderline significant cross-sectional relationship with Revenue Growth which becomes negative, though insignificant in 1983. Thereafter, OPEFF has strong positive effects on the 1984-1985 performance measure. Consistent with theory, this finding suggests that there is a long-term payoff in increased organizational performance associated with high day-to-day HR effectiveness.

<u>Lagged Effects of the 1982 HRM Indices on 1983-1985 Operating Profit</u>. Contrary to expectations, fewer significant relationships between the HRM indices and Operating Profit Rate result from the regression analyses conducted at the individual level (Table G.4) compared to

the correlational analyses. Only two of the HR indices have a statistically significant association with Operating Profit Rate. These are PLADEV, which has a moderate, positive relationship with 1984 OPPLAN, and STREFF, which has a moderate, negative relationship with 1984 OPPLAN.

The pattern of relationships among these variables is fairly consistent. PLADEV has a borderline significant, positive relationship with OPPLAN for three of the four years. SELASS, too, has a relationship that approaches significance with 1983 Operating Profit Rate. The Strategic level HR Effectiveness index has a weaker, negative relationship with OPPLAN for the 1982-1984 timeframe. Only the 1984 relationship is statistically significant, though.

These findings are both encouraging and discouraging. On the one hand, a few useful HRM predictors of Operating Profit Rate emerged from these analyses. But as Operating Profit Rate is more of a short-term rather than a current or long-term performance measure, I expected a stronger relationship between Operational HR Effectiveness and OPPLAN would result in earlier years, with a strong relationship between STREFF and OPPLAN occurring in later years. I also expected a significant relationship between OPPLAN and MGREFF would occur due to the mid-range focus this variable has on acquisition and deployment of human resources. On both accounts, the obtained results do not match the expected results.

Lagged Effects of the 1982 HRM Indices on 1983-1985 ROI. The analyses of the lagged relationships between these variables were conducted both with and without the outlier. Table G.5A illustrates the results of these analyses with the outlier included. As is evident, only one of the HRM indices appears to be a useful predictor of ROI. This is Operational level HR Effectiveness, which has a lagged effect on 1984 and 1985 ROI.

The pattern of the relationships among the variables is inconsistent and mixed. SELASS is the only other HRM variable to approach significance as a predictor of ROI. OPEFF fluctuates between positive and negative in its relationship with this performance measure. With the outlier and consequent high ROI included in the analysis, the findings suggest that in ECG's case, less effective operational level human resource management higher ROI appears to be associated with high ROI during this timeframe.

Removal of the outlier affects the significance of the findings and alters the nature of the relationships. Table G.5B illustrates these results. OPEFF no longer has a statistically significant relationship with 1984-1985 ROI, nor do the remaining HRM indices. The pattern of relationships changes. The three HR effectiveness indices now have positive, though weak relationships with ROI and Structure/Culture now has a consistently weak positive relationship with this performance measure.

As verified by both the archival and qualitative data, these findings are clearly more sensible. With the outlier eliminated, ECG overall experienced a downward trend in ROI from 1983 to 1985. Thus, the observed relationships are more in line with expectations. The amount of variance in 1982 ROI also increases from 8.1% to 13.6% and marginally in the remaining years.

Lagged Effects of the 1982 HRM Indices on 1983-1985 Investment Rate. According to the results of these analyses presented in Table G.6, none of the HR indices has a statistically significant relationship with Average Investment Rate. The pattern of the relationships between the six HR variables and this financial measure is weak, inconsistent and mixed. Only one index (PLADEV) approaches significance in its relationship with Average Investment Rate.

Cross-Sectional and Lagged Regression Analyses: Amount of Variance Explained in Financial Performance. Figure 6.3 presents a plot of the R^2s resulting from these regression analyses. Cross-sectionally, the six 1982 HR indices explain from 8.1% to 12.3% of the variance in the four 1982 financial performance indices. From this point, the amount of variance explained in Revenue Growth increases considerably: 15.5% in 1983, 22.8% in 1984, and 30.4% in 1985. Planning/Development, Strategic and Operational HR Effectiveness indices are all very strong predictors of Revenue Growth, with the strongest lag effects occurring in

FIGURE 6.3: PLOT OF R-SQUARED FOR HR-STRATEGY LINKAGE ON FINANCIAL PERFORMANCE, CROSS-LAGGED 1982-1985
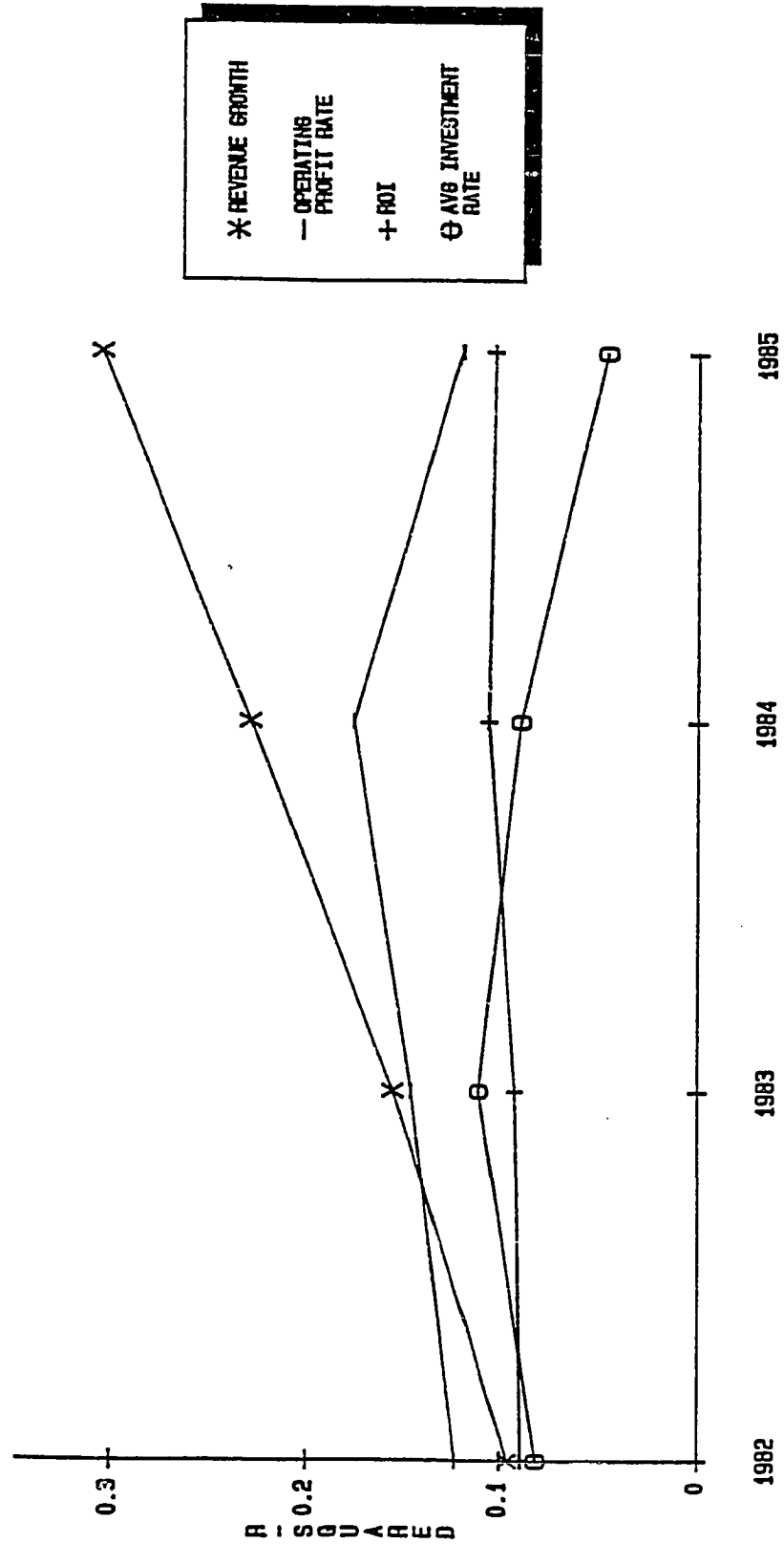
1985. Unquestionably, this is one of the key findings of this research.

The amount of variance explained in Operating Profit also increased notably from 12.3% in 1982 to 17.5% in 1984, falling to 12% in 1985. The 1982 Planning/Development and Strategic HR Effectiveness indices again are useful predictors of Operating Profit, with strong two-year lag effects appearing in 1984.

As is evident, the amount of variance in ROI explained by the six HR indices (with the outlier included) is fairly stable over this timeframe, ranging from 8.1% to 10.3% Only one index, Operational HR Effectiveness, was found to be a strong predictor of ROI, with lag effects evident for the 1984-1985 performance measures. Removing the outlier causes the relationship between OPEFF and ROI to become nonsignificant, though the amount of variance explained in the 1982 performance measure increases from 8.1 to 13.6%. The amount of variance explained in the 1983-1985 results changes very little, however.

Finally, the amount of variance explained in Average Investment Rate increased marginally from 8.1% in 1982 to 11.1% in 1983, then dropped off to 4.5% in 1985. None of the HR indices was found to be a significant predictor of this financial performance measure.

The Effects of the 1982 HRM Indices on the 1983-1985 Financial Performance Measures

Lagged Effects of HRM on 1983-1985 Sales to Pay. None
of the HR indices was found to be a strong predictor of
Sales to Pay. The results of these regression analyses are
presented in Table G.7. As is evident, the pattern of
relationships among the indices is weak and somewhat mixed.
Few of the beta coefficients derived from these analyses are
much greater than .10.

Lagged Effects of HRM on 1983-1985 Sales per Employee.
The results of the regression analyses conducted to examine
the relationship between the six HR indices and Sales per
Employee are depicted in Table G.8 Again, there are no
significant relationships between the HRM indices and this
productivity measure. All of the beta coefficients are
below .20. Clearly, the HRM indices are not good predictors
of either the Sales to Pay or Sales per Employee
productivity measures. In view of the few significant
relationships between these variables that emerged from the
correlational analyses, these findings are not surprising.

Lagged Effects of HRM on 1983-1985 Value-Added Sales
per Employee. Table G.9 indicates that none of the HRM
indices are useful predictors of Value-Added Sales per
Employee. Planning/Development, Selection/Assessment, and
Strategic level HR effectiveness all approach, but fall
short of attaining significant relationships with this
productivity measure.

Lagged Effects of the 1982 HRM Indices on 1983-1985
Gross Inventory Rate. An empirical examination of these

relationships was included in these analyses partly because one of Knudson's organizational transformation initiatives included an asset management campaign. However, none of HRM indices in this series of regression analyses are strong predictors of GINVNT (Table G.10). The beta coefficients suggest that the Selection/Assessment and Operational level HR effectiveness indices may be useful predictors of Gross Inventory Rate, but both indices fall short of reaching significant relationships with this productivity measure. The pattern of relationships overall is mixed and inconsistent.

Lagged Effects of the 1982 HRM Indices on 1983-1985 Scrap/Rework Rate. Only PLADEV has a significant effect on Scrap/Rework Rate, which is positive and appears in 1984 (Table G.11). The pattern of relationships among the remaining variables is mixed and weak. Selection/Assessment, however, has a consistently negative relationship with this productivity measure that comes close to reaching significance from 1982 through 1984.

Cross-Sectional and Lagged Analyses: Amount of Variance Explained in Productivity. Figure 6.4 illustrates the plot of the R^2s for the regressions conducted to examine the relationship of the six 1982 HR indices to the five 1982-1985 productivity measures. As is evident, there is considerable range in the cross-sectional results, with the HR indices explaining only 4.7% of the variance in 1982 Scrap/Rework Rate and 13.4% in Gross Inventory Rate. Some

FIGURE 6.4: PLOT OF R-SQUARED FOR HR-STRATEGY LINKAGE
ON PRODUCTIVITY, CROSS-LAGGED 1982-1985
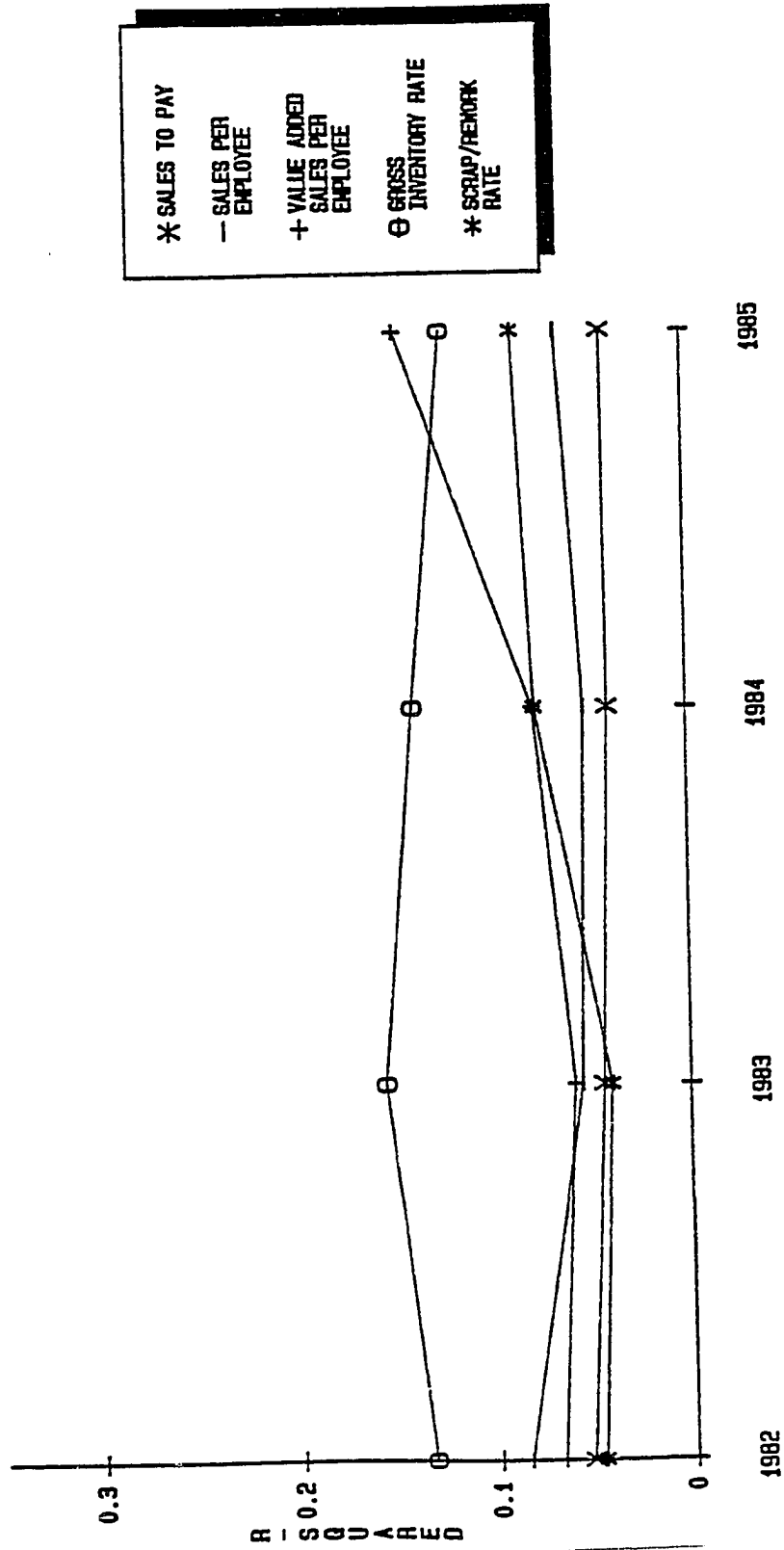
interesting trends emerge that reflect the lagged effects of the HR indices on the productivity measures.

With the exception of Gross Inventory Rate, the amount of variance explained in the 1983 productivity variables by the 1982 HR indices is quite low, ranging from 4.1% to 6.0% A slight increase in the amount of variance explained in these variables is evident for the 1984 productivity results, followed by a notable increase in the variance explained in 1985 Scrap/Rework Rate (8.7%) and Value-Added Sales per Employee (14.8%). These latter results are associated with the strong relationship between the Planning/Development index and 1984-1985 Scrap/Rework Rate and the significant effect of Strategic HR Effectiveness on 1985 Value-Added Sales per Employee.

Though the HRM indices collectively explain the greatest amount of variance in Gross Inventory Rate (12.4 to 15.7%) over time compared to the other productivity variables, none of the indices is a good predictor of this measure. Also, there were no other significant relationships between the six HR indices and the five productivity variables over time. Contrary to my expectations, the HRM indices are relatively poor predictors of ECG's 1982-1985 productivity measures.

Lagged Effects of the 1982 HRM Indices on the 1985 HRM Indices

A question that naturally arises from the formulation of my conceptual model is to what extent are the 1982

indices good predictors of the 1985 indices? It was expected that several strong relationships would emerge from these regression analyses and that a considerable amount of variance would be accounted for by the 1982 indices. Table G.12 contains the results of the six multiple regression analyses conducted to address this question.

Predictors of the 1985 HRM Variables. As is evident, only six significant relationships emerged from these lagged regression analyses. The 1982 MGREFF index has a significant, negative relationship with 1985 STRCUL. SELASS is a very strong predictor of 1985 PLADEV. The magnitude of the beta coefficient raises the question of multicollinearity, but the correlation between these variables fall below our threshold of .85. MGREFF, too, appears to be a useful predictor of 1985 PLADEV. The relationship is positive and as expected.

1982 SELASS is the only strong predictor of 1985 SELASS, though OPEFF comes close to attaining a significant relationship with this index. None of the 1982 HRM variables is a predictor of 1985 STREFF nor do any of these relationships approach significance. OPEFF is the only HR variable strongly related to 1985 MGREFF, as well as to 1985 OPEFF.

Patterns of Relationships. Structure/Culture has no significant relationship with any of the 1985 HRM indices, though it does approach significance in serving as a predictor of 1985 STRCUL. It also has a negative

relationship with Planning/Development that approaches significance. PLADEV and STREFF, too, have no notable associations with any of the 1985 variables. The relationships are very weak and their patterns are also a mix of negative and positive associations.

Selection/Assessment has a highly significant positive effect on 1985 Planning/Development. Strategically selecting and appraising ECG employees has a strong effect on subsequent training and development and career planning to support business strategy. As expected, 1982 SELASS also is strongly related to 1985 SELASS. None of its relationships with the remaining HR indices approaches significance.

Strategic level HR effectiveness has no significant association with any of the 1985 HRM variables, including STREFF. The pattern of relationships is mixed, as expected, though quite weak. All of the beta coefficients are well below .10.

1982 MGREFF has a significant negative relationship with 1985 STRCUL and significant positive relationship with 1985 PLADEV. These relationships are in the expected direction. Theoretically, lower levels of 1982 MGREFF, a measure of mid-term resource acquisition to support business strategy, can be viewed as a causal antecedent of 1985 structural and culture change to help implement business strategy. Conversely, high levels of MGREFF should be

associated with training and development and career planning to support business strategy.

Contrary to expectations, 1982 MGREFF does not have a strong association with 1985 MGREFF. None of its relationships with the remaining HR indices approaches significance. However, 1982 OPEFF has a highly significant relationship with 1985 MGREFF. It also has a strong positive relationship with 1985 OPEFF and a borderline, though nonsignificant relationship with 1985 SELASS. No significant relationships emerged between 1982 OPEFF and the remaining 1985 HR indices.

Amount of Variance Explained in the 1985 HRM Indices by the 1982 HRM Indices. These results, also presented in Table G.12, show that the amount of variance explained by the 1982 HRM indices fluctuates considerably. The least amount of variance explained is in 1985 Strategic HR Effectiveness (8.2%). However, the 1982 HRM indices explain from 17.9% to 40.3% of the variance in the remaining 1985 HRM indices. The 1982 Selection/Assessment, Operational HR Effectiveness, and Managerial HR Effectiveness indices, respectively, are the strongest predictors of the 1985 HRM indices.

Cross-Lagged Regression Analyses

The cross-lagged effects of ECG's 1982-84 financial performance and productivity results on the six 1985 HR indices are examined here to address the nature and direction of the relationships between these variables. More specifically, are the performance measures useful

predictors of the HRM indices? If so, are there more and stronger organizational performance predictors of the HRM indices than there are HRM predictors of performance? The findings from the analyses conducted in this section should provide some answers to these questions. The tables illustrating the results of the cross-lagged regression analyses are located in Appendix H.

Cross-Lagged Effects of the 1982-1984 Financial Performance Measures on the 1985 HRM Indices

The cross-lagged regression analyses were conducted both with and without the extraordinary 1983-1984 performance results for the outlier. Similar to the effect on the correlational results, the removal of the outlier caused a few more relationships between the financial performance and HRM indices to reach significance, and a few others to become nonsignificant in the years where its ROI results were exceptional.

To accomplish my primary objective of examining the utility of the organizational performance measures as predictors of the HRM indices while minimizing the effect of spurious results, I retained the outlier for the 1982 analyses. This was considered appropriate as its ROI results were comparable to the other ECG business units. However, it was excluded from the analyses involving the 1983-1984 financial performance measures in this section.

Cross-lagged Effects of 1982-1984 Financial Performance on 1985 Structure/Culture. A review of these results

presented in Table H.1 reveals few significant relationships
between these variables. All involve the 1983 financial
performance measures and Structure/Culture. Three of the
four 1983 financial performance measures, Revenue Growth,
Operating Profit, and Average Investment Rate, have strong,
significant, and negative relationships with 1985
Structure/Culture.

Overall, the pattern of these relationships is weak and
inconsistent. Average Investment Rate is the only financial
performance measure that has a consistently moderate to
strong association with Structure/Culture, which is also
negative.

Cross-lagged Effects of 1982-1984 Financial Performance
on 1985 Planning/Development. Table H.2 illustrates the
results of these analyses. A third variable was added to
the 1985 PLADEV index, which is comprised of conducting
management development programs, establishing career
planning programs, and succession plans for the top three
levels of management to support strategic goals.

Again, most of the significant relationships occur
between the 1983 Revenue Growth, ROI, and Average Investment
Rate measures and the 1985 Planning/Development. ROI has a
consistently negative relationship with this HRM index which
is highly significant in 1983 and moderately so in 1984. As
such, ROI appears to be a good predictor of 1985
Planning/Development. This finding suggests that the lower
the ROI, the greater the utilization of training,

development, career planning and succession planning to implement strategy, which is also supported by the qualitative data.

Average Investment Rate, too, has a consistent pattern of negative relationships with Planning/Development. The 1983 measure has a significant effect on this HR index. Despite the magnitude of the 1984 beta weight, the relationship between Average Investment Rate and PLADEV falls short of attaining significance.

<u>Cross-lagged Effects of 1982-1984 Financial Performance on 1985 Selection/Assessment</u>. According to these results, presented in Table H.3, 1983 Revenue Growth is the only financial performance variable to exhibit a significant lag effect on 1985 Selection/Assessment. The relationship is negative and borderline in significance. The remaining patterns are weak and somewhat inconsistent. Thus, with the exception of 1983 Revenue Growth and possibly Average Investment Rate, the 1982-1984 financial measures are not useful predictors of 1985 Selection/Assessment.

<u>Cross-lagged Effects of 1982-1984 Financial Performance on 1985 Strategic HR Effectiveness</u>. Table H.4 illustrates these results. Again, few significant relationships emerge from the cross-lagged analyses. The pattern of the relationship between Operating Profit Rate and STREFF is consistently strong and reaches significance in 1984. This suggests that poor operating profit has a positive lag effect on strategic HR effectiveness.

With the outlier excluded, ROI is not a useful predictor of STREFF. The 1983 ROI measure approaches, but falls short of reaching significance. Total Average Investment Rate, though, has a consistently significant, negative relationship with 1985 Strategic HR Effectiveness. The pattern of relationships overall is negative, with some inconsistencies as the magnitude of the beta coefficients fluctuates.

<u>Cross-lagged Effects of 1982-1984 Financial Performance on 1985 Managerial HR Effectiveness</u>. According to the results presented in Table H.5, there are inconsistencies in the pattern of relationships among these variables. Three of the four financial performance measures have significant relationships with MGREFF, some of which vary considerably from one year to the next.

First, 1982 Revenue Growth has a strong positive relationship with MGREFF, followed by a strong negative relationship in 1983. The relationship of 1984 Revenue Growth to MGREFF again becomes positive, but it is nonsignificant. ROI follows a similar pattern, though only the 1983 measure is significantly related to MGREFF. These inconsistencies are difficult to interpret, though they are largely restricted to the short-term financial performance measures. Both Revenue Growth and ROI tend to be unstable, fluctuating considerably from good to mediocre or poor years, which partially explains the sign reversals.

Operating Profit Rate is negatively associated with MGREFF. The 1984 measure appears to be a useful predictor of 1985 Managerial level HR effectiveness. Average Investment Rate also displays a consistent pattern of negative relationships with MGREFF. Only the 1983 measure is strongly associated with the mid-range management of human resources, though the 1984 measure also approaches significance.

Cross-lagged Effects of 1982-1984 Financial Performance on 1985 Operational HR Effectiveness. Few significant relationships emerge from these analyses, the results of which appear in Table H.6. Again, Revenue Growth displays an inconsistent pattern of relationships with OPEFF. The 1982 measure has a strong, positive association with OPEFF, followed by a highly significant, negative relationship between the 1983 performance measure and the HR index. The relationship between the 1985 measure and OPEFF is positive, but nonsignificant. These results, however, also suggest that there may be a reciprocal relationship between Revenue Growth and Operational level HR effectiveness in ECG.

The 1982 ROI measure has a significant positive relationship with 1985 Operational HR Effectiveness, though the pattern of the remaining relationships this measure has with OPEFF is also inconsistent and mixed. The beta coefficients resulting from the 1983-1984 regressions fall far short of approaching significance.

Cross-Lagged Analyses: Amount of Variance Explained in the 1985 HRM Indices by 1982-1984 Financial Performance. Figure 6.5 illustrates the R^2s derived from the analyses examining the cross-lagged relationships between the financial performance and HR indices. As was discussed atthe beginning of this chapter, the cross-sectional (1982) relationships between the financial performance variables and the HR indices are not that pronounced. However, considerably more variance in Managerial and Operational level HR Effectiveness (8.4 to 9.8%) is explained than in the remaining six HRM indices (3.3 to 5.5%).

Substantial differences are evident, though, in the relationships between the 1983 financial performance measures and the HRM indices. Again, considerably more variance in Managerial and Operational level HR Effectiveness is explained (12.8 to 17%) than in the remaining HR indices (4.4 to 8.5%). By comparison, the amount of variance explained in the 1985 HR indices by the 1984 financial performance variables drops off considerably and is marginal, ranging from 1.2% to 6.3%.

Among the four financial performance measures, Revenue Growth was found to be the most consistent predictor of the HRM indices. This financial performance measure has a significant relationship with all the HRM indices with the exception of Strategic level HR Effectiveness. However, the pattern of relationships Revenue Growth has with these variables was found to be inconsistent and mixed. These

FIGURE 6.5: PLOT OF R-SQUARED FOR FINANCIAL PERFORMANCE
(1982-1984) ON HR-STRATEGY LINKAGE AND HR EFFECTIVENESS (1985),
LAGGED
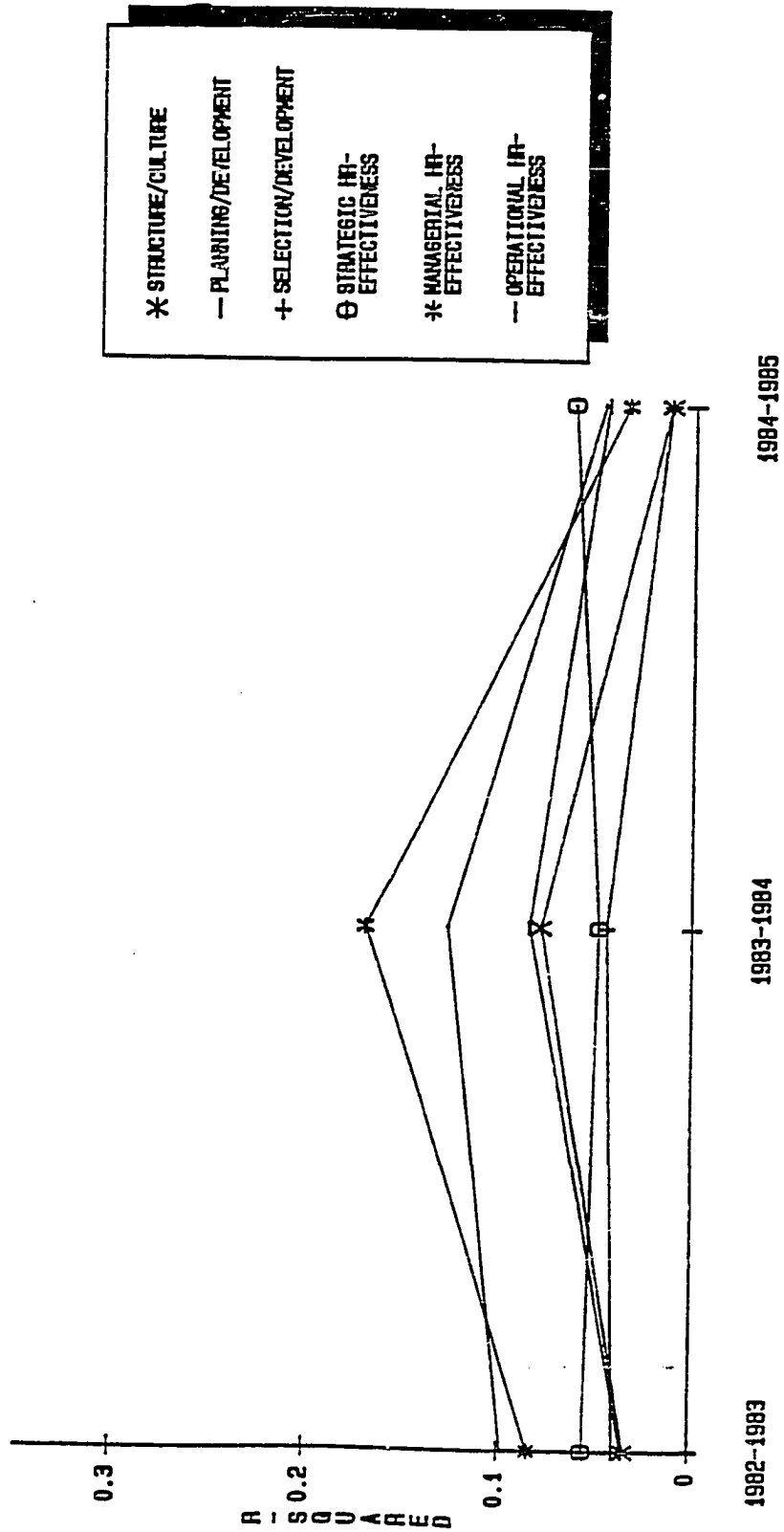
findings, though, suggest that there may be a reciprocal relationship between Operational level HR effectiveness and Revenue Growth.

Cross-Lagged Effects of the 1982-1984 Productivity Measures on the 1985 HRM Indices

Compared to the lagged analyses, fewer significant relationships emerged from the cross-lagged regression analyses with or without the outlier. Though the differences in significant findings are marginal, they favor the outlier. Thus it is included in the analyses discussed in this section.

Cross-lagged Effects of 1982-1984 Productivity on 1985 Structure/Culture. According to these results, presented in Table H.7, none of the productivity measures has a significant effect on STRCUL. The pattern of relationships is also mixed. The Sales per Employee and Value-Added Sales per Employee measures have moderate, negative relationships with STRCUL that approach but do not attain significance.

Cross-lagged Effects of 1982-1984 Productivity on 1985 Planning/Development. The results of these regression analyses are illustrated in Table H.8. They reveal that the only significant relationships that emerge are those between 1982-1984 Gross Inventory Rate and Planning/Development, which are also negative. The remaining productivity variables largely show inconsistent, mixed and weak patterns in their relationships with Planning/Development.

Cross-lagged Effects of 1982-1984 Productivity on 1985 Selection/Assessment. Only Scrap/Rework Rate has a significant effect on Selection/Assessment, which is consistently negative (Table H.9). Despite the magnitude of the beta coefficients, 1982 and 1983 Sales to Pay come close but fall short of attaining significance as do the 1983-1984 Sales per Employee measures. The pattern of relationships between the HRM indices and SELASS, though mixed, is fairly stable.

Cross-lagged Effects of 1982-1984 Productivity on 1985 Strategic Level HR Effectiveness. These results, depicted in Table H.10, are also mixed. Despite the magnitude of the 1983-1984 Sales to Pay and Sales per Employee beta coefficients, these productivity measures do not have a significant effect on STREFF. Only 1982 Sales per Employee and Scrap/Rework Rate appear to be useful predictors of 1985 Strategic HR Effectiveness. The high beta coefficients are largely attributable to the strong correlations between these two variables. These results support the earlier findings that the productivity measures are not good predictors of 1985 Strategic level HR Effectiveness.

Cross-lagged Effects of 1982-1984 Productivity on 1985 Managerial Level HR Effectiveness. According to these results, illustrated in Table H.11, a few productivity ,measures are useful predictors of 1985 Managerial HR Effectiveness. Sales to Pay has a pattern of strong, negative relationships with MGREFF. Though the magnitude

of the 1983 beta coefficient is quite large, it is not significant. In comparison, Sales per Employee has a fairly strong positive pattern of relationships with MGREFF. The 1982 measure has a significant effect on MGREFF, but though the magnitude of the 1983 and 1984 beta coefficients is large, they are not significant.

One other 1982 productivity measure, Scrap/Rework Rate, also appears to be a useful predictor of MGREFF. The 1983 and 1984 measures, though also negative, have very weak relationships with MGREFF. The pattern of relationships of the remaining two productivity variables to MGREFF is inconsistent and weak.

<u>Cross-lagged Effects of 1982-1984 Productivity on 1985 Operational Level HR Effectiveness</u>. Only one significant relationship emerged from these analyses, the results of which are illustrated in Table H.12. As is evident, 1983 Sales to Pay is the sole useful predictor of 1985 Operational level HR effectiveness. The beta coefficients for the 1982 and 1984 Sales to Pay measures, though fairly large in magnitude and also negative, are not significant.

The 1983 and 1984 Sales per Employee measures also have relatively large beta coefficients given their strong correlations with Sales to Pay, though they are not significant. The remaining productivity measures display mixed, weak patterns of relationships with 1985 Operational HR Effectiveness.

Cross-Lagged Analyses: Amount of Variance Explained in the 1985 HRM Indices by 1982-1984 Productivity. Figure 6.6 illustrates the amount of variance in the 1985 HR indices explained by the five productivity variables. Though no major fluctuations are evident here as they are for the amount of variance explained by the financial performance measures, interesting differences are apparent. Forexample, the productivity measures consistently explain more of the variance in 1985 Selection/Assessment and Planning/Development (7.4 to 9.9%) than they explain in Strategic HR Effectiveness and Structure/Culture (1.1 to 6.8%). The magnitude of the difference, however, is not large. In fact, slightly more of the variance in cross-sectional Managerial HR Effectiveness (10.4%) is accounted for by the productivity variables than it does for the remaining indices in subsequent years. Gross Inventory Rate and Scrap/Rework Rate have more consistent associations with the HR indices than do the other productivity measures, though the effects of Sales to Pay and Sales per Employee are stronger.

Longitudinal Assessment of the Regression Analyses: An Overview of the 1982-1985 Results

In this section, key findings derived from the series of regression analyses conducted to explore the predictive validity of the HRM indices and performance measures at the individual level are reviewed and summarized. To facilitate the interpretation of the overall results, the cross

FIGURE 6.6: PLOT OF R-SQUARED FOR PRODUCTIVITY(1982-1984) ON HR-STRATEGY LINKAGE AND HR EFFECTIVENESS (1985), LAGGED
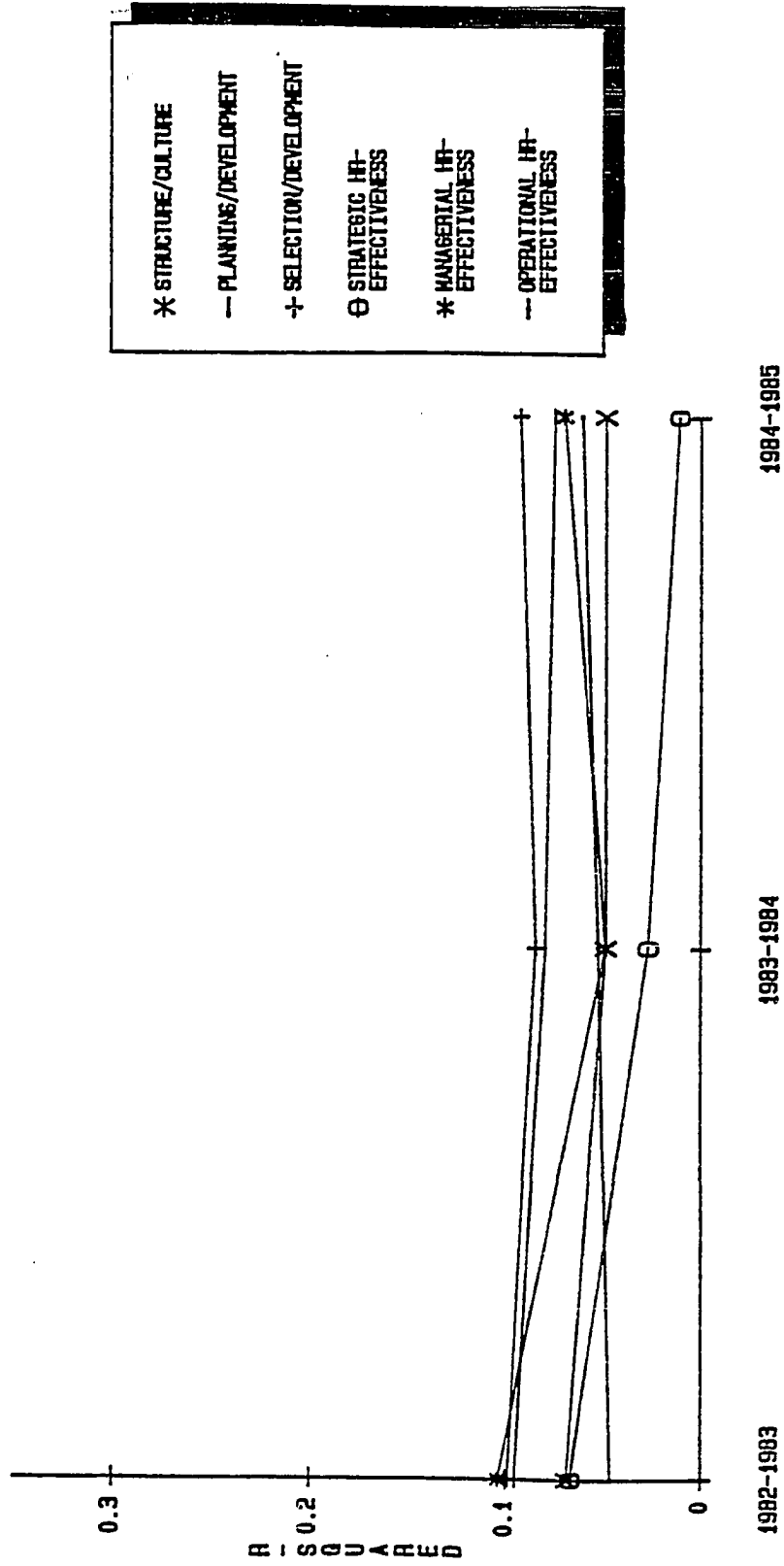
sectional, lagged, and cross-lagged relationships between these variables are presented by level of significance in the form of tables.

Fewer significant relationships resulted overall from the regression analyses discussed in this chapter than were expected based on the strength of the relationships that emerged from the correlational analyses presented in Chapter Five. First of all, as evident in Table 6.1, none of the 1982 HRM indices were found to be useful predictors of the 1982 financial performance measures.

This finding is not unusual. There are at least three reasons why none of these cross-sectional relationships and several others included in the various regression analyses reviewed in this chapter do not achieve statistical significance: (1) though 40% of the Wave 1 and about 25% of the Wave 2 cases were unusable, more variance is introduced at the individual level compared to the business unit level of analysis; (2) strategic HRM in ECG was in an early stage of evolution in 1982--the action research project was an intervention designed to enhance strategic HRM capability and performance; and (3) many of the HRM indices have a mid- to long-term rather than short-term focus or orientation.

Due to the first reason, fewer significant relationships were expected overall from these series of regression analyses than were observed as a result of the correlational analyses. Primarily for the second and third reasons, in regard to the regression analyses, more

significant 1985 cross-sectional results were expected than were 1982 cross-sectional findings. For the same reasons, relatively more significant 1982-1984 lagged results were also expected.

As indicated in the first column of Table 6.2, several significant relationships did emerge from the 1985 cross-sectional regression analyses. The HR Effectiveness indices, in particular, are moderate to strong predictors of Operating Profit Rate and Average Investment Rate. In addition, Strategic level HR Effectiveness has a weak relationship with ROI and Managerial level HR effectiveness has a moderate relationship with Revenue Growth.

According to the results illustrated in Table 6.1, there are relatively few significant lagged relationships of the 1982 HRM indices to the 1983-1985 financial performance measures at the individual level. Only one of the HR-Strategy Linkage indices (PLADEV) and two of the HR Effectiveness indices (STREFF and OPEFF) have significant relationships with the 1983-1985 financial performance measures. Both Planning/Development and Strategic level HR effectiveness are useful predictors of short- and long-term Revenue Growth. The same HR indices are also useful predictors of mid-range Operating Profit Rate, though the strength of these relationships is weak. In addition, Operational level HR effectiveness is a strong predictor of both 1984-1985 Revenue Growth and ROI.

Little more can be added regarding emergent patterns

Table 6.1   Summary of the Cross-Sectional and Lagged
            Relationships of the 1982 HRM Indices to
            1982-1985 Financial Performance[1]

Index:	1982 RG	OP	ROI	IR	1983 RG	OP	ROI	IR	1984 RG	OP	ROI	IR	1985 RG	OP	ROI	IR
STRCUL																
PLADEV					S+				W+				S-			
SELASS																
STREFF					M-				W-				S+			
MGREFF																
OPEFF										S+	M-			S+	M-	

Table 6.2   Summary of the Cross-Sectional Relationships
            of the 1985 HRM Indices to 1985 Financial
            Performance and Productivity

Index:	1985 RG	OP	ROI	IR	1985 STOPAY	SALEMP	VADSL	GINVT	SCRAP
STRCUL									
PLADEV		W-				W-		S-	
SELASS									S+
STREFF		W+	S-		W+				
MGREFF	M+	S-		S+	W-				
OPEFF		S+		M-				M+	

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1   The labels in the tables are abbreviations for the six
    HRM indices, four financial performance and five
    productivity measures. The letters designate the
    strength of the correlations between the variables.
    Keys: +/- = positive or negative relationship
          W=weak   (.05<p<.10)   RG=Revenue Growth
          M=moderate   (.01<p<.05)   OP=Operating Profit
          S=strong   (.001<p<.01)   ROI=Return on Investment
          VS=very   IR=Average Investment
            strong   (p<.001)   Rate

Table 6.3   **Summary of the Cross-Lagged Relationships of the 1982-1984 Financial Performance Measures to the 1985 HRM Indices**[2]

Index:	1982				1983				1984			
	RG	OP	ROI	IR	RG	OP	ROI	IR	RG	OP	ROI	IR
STRCUL					M-		W-	M-				
PLADEV					M-		S-	M-			W-	
SELASS					W-							
STREFF			W-					M-	W-		W-	
MGREFF	S+				VS-		M-	W-	W-			
OPEFF	S+			W+	VS-							

than was stated above in view of the few significant relationships between these variables. Overall, none of the HRM indices are useful concurrent (1982) predictors. With the exception of PLADEV and STREFF, none of the indices is a good short-term predictor of performance either. PLADEV, STREFF, and OPEFF collectively are the only useful predictors of mid-range and long-term financial performance-specifically Revenue Growth, Operating Profit, and ROI.

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2 The labels in the vertical column of the table are abbreviations for the six HRM indices. The numbers 1-5 refer to the five productivity measures and the letters designate the strength of the correlations between the variables.
Keys: +/- = positive or negative relationship
      W=weak   (.05<p<.10)   1=Sales to Pay
      M=moderate (.01<p<.05)   2=Sales per Employee
      S=strong   (.001<p<.01)   3=Value-Added Sales per
    VS=very   Employee
        strong   (p<.001)   4=Gross Inventory Rate
                            5=Scrap/Rework Rate

Table 6.3 displays the results of the cross-lagged regression analyses of the relationships of 1982-1984 financial performance to the 1985 HRM indices. As is evident, the frequency and magnitude of the cross-lagged predictors outnumbers those of the lagged predictors, which is counter to my expectations. In particular, the 1982-1983 Revenue Growth measures are strong predictors of 1985 Managerial and Operational level HR effectiveness.

With the exception of Operating Profit Rate, the 1983 financial performance measures generally are useful predictors of several of the 1985 HRM indices. The relationships of the 1983 ROI and Average Investment Rate measures to STRCUL, PLADEV, MGREFF, and OPEFF do not differ considerably from those of 1983 Revenue Growth with the same indices. Even with the outlier removed from these analyses, 1983 Revenue Growth, ROI, and Average Investment Rate exhibit weak to very strong significant relationships with five of the six HRM indices.

Despite the number of significant relationships, a distinct overall pattern of relationships is not easily discernible as the majority of the predictors are 1983 financial performance measures. The relationships of both the 1982 and 1984 financial performance measures to the HRM indices are weak and few in number. In general terms, the 1982-1984 financial performance measures are better predictors of HR Effectiveness than they are of the HR-Strategy linkage indices. In more specific terms, a few

trends or patterns are evident: 1983-1984 ROI and Average Investment Rate are useful predictors of Planning/Development and Strategic level HR Effectiveness respectively, and 1982-1983 Revenue Growth is a strong predictor of both Managerial and Operational level HR Effectiveness.

Tables 6.2 and 6.4 summarize the significant cross-sectional and lagged relationships of the HRM indices to the productivity measures. Again no significant findings emerged from the 1982 cross-sectional analyses (Table 6.4). There is also only one significant lagged relationship, which is weak in strength--1982 Planning/Development and 1984 Scrap/Rework Rate. However, several significant relationships result from the 1985 cross-sectional analyses (Table 6.2). The relationships of both 1985 Strategic and Managerial level HR effectiveness and 1985 Sales to Pay are also significant.

Table 6.5 presents the results of the cross-lagged regression analyses of the relationships of the 1982-1984 productivity measures to the 1985 HRM indices. As is evident, the frequency and magnitude of the cross-lagged predictors are greater than those of the cross-sectional and lagged predictors.

In brief, four of the 1982 productivity measures have weak to strong relationships with four of the HRM indices. More specifically, 1982 Scrap/Rework Rate appears to be a moderate to strong predictor of 1985 Strategic level HRM

Table 6.4 Summary of the Cross-Sectional and Lagged Relationships of the 1982 HRM Indices to 1982-1985 Productivity[3]

Index:	1982					1983					1984					1985				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL																				
PLADEV														W+						
SELASS																				
STREFF																				
MGREFF																				
OPEFF																				

Table 6.5 Summary of the Cross-Lagged Relationships of the 1982-1984 Productivity Measures to the 1985 HRM Indices

Index:	1982					1983					1984				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STRCUL															
PLADEV			W-					M-					M-		
SELASS					S-			M-							S-
STREFF		W+			M-										
MGREFF	S-	M+			W-						W-				
OPEFF						W-									

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3 The labels in the vertical column of the table are abbreviations for the six HRM indices. The numbers 1-5 refer to the five productivity measures and the letters designate the strength of the correlations between the variables.

Keys: +/- = positive or negative relationship

W=weak	$(.05 < p < .10)$	1=Sales to Pay
M=moderate	$(.01 < p < .05)$	2=Sales per Employee
S=strong	$(.001 < p < .01)$	3=Value-Added Sales per
VS=very		Employee
strong	$(p < .001)$	4=Gross Inventory Rate
		5=Scrap/Rework Rate

ffectiveness and Selection/Assessment, and a weak predictor of Managerial level HR effectiveness. Both 1982 Sales per Employee and Sales to Pay, too, appear to be useful predictors of 1985 Managerial level and Strategic level HR Effectiveness.

Though the remaining relationships are sporadic, a few patterns are detectable. The relationships of 1982-1984 Gross Inventory Rate to 1985 Planning/Development are consistently significant as are the strong relationships of 1982-1984 Scrap/Rework Rate to Selection/Assessment. In addition, 1982 and 1984 Sales to Pay appears to be a useful predictor of 1985 Managerial level HR Effectiveness.

Thus, these analyses highlight the importance of some of the productivity measures as useful predictors of the 1985 HRM indices. The direction of the relationship between these variables appears to be more unidirectional than reciprocal, as was suggested by the results of the correlational analyses. In particular, 1982 Sales to Pay, Sales per Employee, and Scrap/Rework Rate have strong three-year lagged effects on three of the HRM indices.

Summary

This chapter opened with questions regarding the validity of the HRM indices and organizational performance measures as predictors at the individual level of analysis. What is the direction of causality? Are the HRM indices distinctly stronger and/or more useful predictors of financial performance and productivity in ECG? Or is

relationship stronger in the reverse direction? What are the patterns of the significant relationships that emerge across time? The results of the cross-sectional, lagged, and cross-lagged regression analyses provide the information required to appropriately address these questions.

In a few words, the frequency and magnitude of the significant cross-lagged findings are greater than those of the cross-sectional and lagged results. The performance measures, in some respects, are stronger and more numerous predictors of the HRM indices. In general, the effects of performance measures and HRM indices on each other also tend to be more pronounced mid-range to long-term rather than concurrently or short-term. There is one prominent exception--the 1985 HR effectiveness indices have fairly strong concurrent effects on the 1985 financial performance measures.

Given the complexity of the relationships that have been empirically examined in this chapter, this response is insufficient. Several strong HRM predictors emerged from these analyses, and the HRM indices overall explain a considerable amount of variance in several of the performance measures. A brief synopsis of the key findings is provided here.

The 1982 HRM indices overall proved to have little utility as cross-sectional predictors of 1982 financial performance or productivity. The three 1985 HR effectiveness indices, however, are useful, if not strong

concurrent predictors of Revenue Growth, Operating Profit, ROI, and Average Investment Rate.

Regarding the cross-sectional relationships between the 1985 HRM indices and productivity measures, very few significant results emerged. In general, these findings, coupled with the amount of variance in the performance measures they explain, suggest that the HRM indices are fairly useful predictors of cross-sectional financial performance and poor concurrent predictors of productivity.

Turning to the lagged relationships, fewer strong HRM predictors of financial performance resulted from these analyses than were expected. The Planning/Development and Strategic level HR effectiveness indices were found to be strong predictors of 1983 and 1985 Revenue Growth, and weak, though useful predictors of 1984 Operating Profit Rate. The remaining strong predictor emerging from these analyses is Operational level HR Effectiveness, which has a moderate to highly significant relationship with 1984-1985 ROI and Revenue Growth. These results are supported by the amount of variance explained by the HRM indices. The magnitude of the R^2s collectively range from a low of 9.1% to 30.4% for 1982-1985 Revenue Growth, Operating Profit Rate, and ROI.

The HRM indices have almost no significant lagged effect on the productivity measures. Only Planning/Development emerged as a potentially useful predictor--it has a significant, though weak relationship with 1985 Scrap/Rework Rate. However, the amount of

variance explained by the HRM indices does rise to 15-16% for the Value-Added Sales per Employee and Gross Inventory Rate measures.

The cross-lagged effects of the financial performance and productivity measures were greater in frequency and strength than was expected. In particular, the 1982-1983 Revenue Growth measures are strong predictors of 1985 Managerial and Operational level HR effectiveness, and the 1983 ROI measure excluding the outlier is a useful predictor of Structure/Culture, Planning/Development, and Managerial level HR effectiveness. Though a few of the 1984 financial performance variables emerged as weak predictors of specific HRM indices, the large majority of the significant relationships involve the 1983 performance measures: Revenue Growth, ROI, and Average Investment Rate.

The performance variables account for 12.8% to 17% of the variance in 1983 Operational level and Managerial level HR effectiveness respectively. However, the amount of variance explained in the remaining HRM indices is generally well below 10%. There is evidence of reciprocal causality, though. This pertains particularly to the 1983 Revenue Growth measure and the Planning/Development index, each of which was found to be a useful predictor of the other.

The cross-lagged relationships of the 1982-1984 productivity measures to the 1985 HRM indices were found to vastly outnumber the lagged relationships. The 1982 Sales to Pay, Sales per Employee, and Scrap/Rework Rate measures

are useful predictors of four of the HRM indices. In addition, patterns are evident of the relationships of Sales to Pay to MGREFF, Scrap/Rework Rate to Selection/Assessment, and Gross Inventory Rate to Planning/Development across time. However, the amount of variance in the 1985 HRM indices explained by the productivity variables is fairly low, with the exception of Managerial level HR effectiveness (10.4%).

Finally, the efficacy of the 1982 HRM indices as predictors of the 1985 HRM indices was also examined. Three of the six 1982 indices were found to be useful predictors. Selection/Assessment is a strong predictor both of 1985 Planning/Development and the 1985 Selection/Assessment index. Managerial level HR effectiveness is a useful predictor of 1985 Structure/Culture, and Operational level HR effectiveness is a quite strong predictor of both 1985 Managerial level as well as Operational level HR effectiveness.

With the results of these series of regression analyses at the individual level reviewed in detail and briefly summarized, I now turn to my concluding chapter and to a discussion of the implications of the key findings from this research.

CHAPTER SEVEN

DISCUSSION

"I have steadily endeavored to keep my mind free
so as to give up any hypothesis, however beloved,
as soon as facts are shown to be opposed to it."

Charles Darwin

Recapitulation

The central issue addressed in this research is the
extent to which a set of human resource management variables
influence and are impacted by a set of organizational
performance variables within the largest business of a
Fortune 100 company. To guide the investigation of the
relationships between these variables, I formulated three
specific objectives: (1) to develop a conceptual model that
facilitates the examination of the longitudinal
relationships between strategic human resource management,
HR effectiveness, and organizational performance; (2) to
empirically test the model and report preliminary results;
and (3) to discuss the implications of these findings for
theory and practice.

Chapters One through Four, in various ways, address or
support the initial research objective. The first chapter
provides a brief overview of the action research study and
the theoretical and practical importance of the research

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questions on which this thesis is based. It also introduces a schematic of the research design that is the foundation for the construction of the conceptual model that follows and advances theoretical propositions regarding the nature and direction of the relationships between these variables.

Chapter Two reviews the emerging literature on strategic human resource management. Specific attention is paid to definitional issues, theoretical approaches, and previous research investigating the relationship of human resource management to organizational performance. Research promises and challenges are identified and linked back to the objectives of this study.

Chapter Three focuses on research methods. The activities associated with both waves of the study from design through implementation including operationalization of conceptual frameworks and instrument development are described and summarized. A refined version of the conceptual model outlining the longitudinal relationships between the HR-Strategy Linkage and HR Effectiveness constructs and organizational performance is presented. A qualitative assessment of progress in strategic human resource management in ECG from 1982 to 1985 is also provided. The chapter concludes with a description of the analytical plan of this study.

Chapter Four reviews methodological procedures employed to create the indices representing the constructs in the conceptual model. The univariate, bivariate, and

multivariate data analytical procedures used to generate the indices representing the constructs in the conceptual model are described.

The next two chapters largely accomplish the second objective of this research--the empirical testing of the conceptual model. Chapter Five, in part, addresses the issue of predictive validity through the examination of the results of a series of cross-sectional, lagged, and cross-lagged correlational analyses. These tests are performed at the business unit level of analysis to examine the strength, direction, and pattern of the relationships between the HRM indices and performance measures. Detailed results of these analyses are reported at the close of the chapter.

Chapter Six addresses the important issue of causality--the predictive capability of the HRM indices and performance measures. These analyses are based on individual level data, which is permissible because of few significant differences in the survey results between the business units. An additional series of cross-sectional, lagged, and cross-lagged multiple regression analyses are conducted to empirically test the model and identify useful predictors of the performance measures and HRM indices at various points in time. The chapter closes with a thorough evaluation of the key findings derived from these analyses.

In this seventh chapter, the third, last, and most challenging research objective is tackled: discussing the implications of these findings for theory and practice.

This is followed by an assessment of the study's limitations and potentially fruitful directions for future research. Prior to commencing this task, the key findings derived from the correlational and regression analyses are briefly summarized and linked back to the research questions originally posed.

Summary and Discussion of Research Findings

In Chapter One, a set of six propositions were formulated regarding the relationships between the HRM indices and the performance measures. They also served as guidelines for the analyses in Chapters Five and Six to facilitate the interpretation of the data and address the research questions regarding the magnitude and direction of the relationships among the HRM indices and performance measures in ECG. If theoretical assertions expressed in the literature are correct, that is, if it can be conclusively stated that human resources _drives_ rather than is _driven by_ organizational performance, then in a few words, the cross-sectional and lagged results should be strong and the cross-lagged findings weak.

Without question, these are broad generalizations that require elaboration and justification. If human resources management does affect organizational performance, then ECG's pre-intervention HR practices and effectiveness should be significantly related to productivity and financial performance, both short- and long-term. Second, as the action research project was targeted to enhancing the

strategic capability of human resource management and overall HR effectiveness in ECG, if the interventions were successful, then the 1985 cross-sectional results should be stronger and more numerous than the results of the similar 1982 analyses. Third, the cross-lagged effects of the financial performance and productivity variables should be minimal--considerably less in strength and number than the cross-sectional and lagged results. Finally, the HRM indices should explain a sizable portion of the variance in the performance measures--again, much greater than the reverse.

The six propositions are presented in Table 7.1 and serve as a crude measuring stick for addressing the research questions. The table provides an evaluation of the strength and number of the significant relationships of the HRM indices to the financial performance and productivity measures to determine whether these propositions hold. Evaluations are provided based on the key findings derived from the correlational and regression analyses. In the case of the former, the results reviewed are derived from the correlational analyses with the outlier excluded.

Overall, the analytical results are mixed but meaningful. They reinforce the contention that the relationships among the variables studied are complex, and that the direction of causality is not always clear.

Summary of Correlational Analyses Results

The results of the correlational analyses, in general,

Table 7.1   Evaluation of Key Findings According to Research Propositions: Correlation and Regression Results

Propositions:	Correlation Results[1]		Regression Results
1. the 1982 cross-sectional effects of the HRM indices on the 1982 performance measures are significant	SHR-F: EFF-F: SHR-P: EFF-P:	S O W W	O O O O
2. the 1985 cross-sectional effects of the HRM indices on the 1985 performance measures are significant	SHR-F: EFF-F: SHR-P: EFF-P:	W W S W	O S M W
3. the 1985 cross-sectional effects are greater in strength and number than the 1982 cross-sectional effects	SHR-F: EFF-F: SHR-P: EFF-P:	− − S =	W S M M
4. the lagged effects of the 1982 HR indices on the 1983-1985 performance measures are greater in strength and number than the cross-sectional effects of the 1982 HRM indices on the 1982 performance measures	SHR-F: EFF-F: SHR-P: EFF-P:	S M S M	W S O O
5. the lagged effects of the 1982 HRM indices are greater in strength and number than the cross-lagged effects of the same performance measures on the 1985 HRM indices	SHR-F: EFF-F: SHR-P: EFF-P:	S = − W	− − − −
6. the amount of variance in the performance measures explained by the HRM indices is greater than the variance in the HRM indices explained by the performance measures	F: P:	NA NA	M-S M-S

1 SHR = Strategic HRM; EFF = HR Effectiveness Indices
  F = Financial Performance; P = Productivity Measures
  S,M,W = strong, moderate, or weak support
  O = None or almost no significant relationships
  = = about the same number and strength of relationships
  − = relationships stronger in opposite direction
  NA = Not Applicable

provide <u>moderate to strong support</u> for the propositions. The weakest support is provided for Proposition No. 3--the strength of the 1985 cross-sectional results in comparison to the 1982 results. This is a relatively minor point, however, as both the 1982 and 1985 results are significant.

A second point of contention involves the strength of the cross-lagged correlations in comparison to the lagged results (Proposition No. 5). The productivity variables have a noticeably stronger effect on the strategic HRM indices than the reverse, and the effects of the financial performance variables and the HRM indices on each other are fairly equal. These results provide evidence of reciprocal causality.

Support for the remaining propositions largely ranges from weak to strong. Thus, viewed independent of the regression results, a compelling argument can be made based on the significant findings and patterns of relationships emerging from these analyses that HRM does have a significant effect on organizational performance.

Summary of Regression Analyses Results

The regression analyses, in comparison, reveal fewer significant results accompanied by more mixed patterns of relationships. Consequently, they provide inconsistent support for the findings of the correlational analyses and vary in their compliance with the conditions that have been outlined. None of the 1982 HRM indices is a useful predictor of 1982 organizational performance (Proposition

No. 1). The 1985 cross-sectional results, though are significant, with the exception of the effects of the strategic HRM indices on financial performance. No significant results are evident (Proposition No. 2).

The 1985 cross-sectional results are, in general, quite significant, which strongly supports Proposition No. 3. However, the indices have few significant relationships with the 1982-1985 productivity measures, which moderately supports Proposition No.4, and the cross-lagged findings are greater in number and magnitude than the lagged results, offering no support whatsoever for Proposition No. 5. This latter finding, in particular, provides strong evidence that the relationships between a few of the HRM indices and both sets of organizational performance measures may be reciprocal, which complements the findings of the correlational analyses. Lastly, the HRM indices do account for a notable portion of the variance in the performance measures, which is considerably greater than the amount of variance in HRM accounted for by the performance measures. Thus, moderate to strong support is provided for Proposition No. 6. Overall, in general, the regression analyses provide weak to moderate support for four of the six propositions.

Several intriguing questions are raised by different findings derived from the two separate series of analyses. Why are there differences in the first place? Is one set of findings of greater value than the other? And what are the implications of the key findings for theory and practice?

In response to the first question, though the results of both series of analyses enhance our understanding of the direction and nature of the relationships between these variables, they are not directly comparable. Pearson correlation coefficients are <u>not directly equivalent</u> to beta coefficients. Of major importance is the fact that considerably more variance is introduced when these data are analyzed at the individual level, which adversely affects the strength and number of significant regression findings. In effect, less variance at the business unit level increases the probability of obtaining more significant findings. Thus, it was expected that the series of correlational analyses would generate more significant relationships exhibiting somewhat different patterns.

To answer the second question, even though differences exist in results and key findings, both analyses are important for the scholarly and practical purposes of this research. The Pearson correlation analyses provide insights into the strength, direction, and pattern of the relationships between these variables. They have varying utility as <u>monitors</u>[1] of changes in the bivariate relationships under empirical investigation.

The regression analyses, on the other hand, identify useful <u>predictors</u>, address causality issues, and explain

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1 Denison (1982) likened monitors to thermometers which are effective gauges of current states, and predictors to barometers, which can forecast future changes based on current conditions. These analogies are elegant in their simplicity and reinforce the utility of both methodological techniques for my research purposes.

variance in the dependent variables. Their importance cannot be overstated--depending on level of significance, they can demonstrate great utility for forecasting change. In this case, they can predict improvement or decline in financial performance or productivity, or in strategic HRM or HR effectiveness, as the case may be.

Strong correlation coefficients do not necessarily mean that the independent variable in question is a good predictor. Yet on the other hand, the strength of the relationships indicated by the Pearson correlations should not be disregarded. Thus both the monitors and predictors emerging from the correlational and regression analyses have implications for theory and practice, to which I now turn.

Theoretical and Practical Implications

The results of the analyses conducted to empirically test the conceptual model developed for this thesis have implications for both theory and practice. Admittedly, these are not mutually exclusive categories--some overlap is evident. In this section, specific attention is devoted to each.

Theoretical Implications

The longitudinal action research design provides an opportunity to empirically examine a frequently debated topic--the relationship between human resources effectiveness and organizational performance. Does effective human resource management truly affect the bottom

line as both Kravetz (1988) and Schuster (1986) argue? In addition, are Naisbitt and Auberdene (1985) and other futurists correct in their assertions that the strategic management of human resources is paramount to future organizational performance? Though based on a multiple business unit case study, this research contributes to addressing these issues and providing some tentative answers, and also stimulating a plethora of additional research questions. The schematic of the research design and the conceptual model lend themselves nicely to expanding our conceptual approach to understanding the complex relationships between these variables.

For example, the longitudinal research design allowed for examination of patterns of relationships and identification of useful predictors through the results of the correlational and regression analyses respectively. One observation of patterns that emerged is that planning (in the form of management development and career planning) is a stronger predictor of short-term financial performance whereas both a strategic and an operational emphasis (i.e., strategic and operational HR effectiveness) were better predictors of performance two to three years in the future. Given ECG's mission and strategy and pattern of revenue growth, these findings are telling of where emphasis in strategic, managerial, and operational level HR management might best be placed to predict both short-term as well as long-term performance.

Yet on the other hand, the HR-Strategy Linkage and HR Effectiveness indices had little effect on productivity. Logically, productivity and the financial performance measures, particularly operating profit and return on investment, are interdependent. Therefore, it was expected that there would be a stronger relationship between the HRM variables and productivity than was realized, especially as improved productivity had become a top management mandate in ECG. Are these findings unique to ECG or is there little relationsnip between HRM and productivity?

Effectiveness is an unbounded construct (Cameron and Whetten, 1983) and poses tricky conceptual and methodological issues. For the purposes of this study, perceptual measures of effectiveness were utilized to operationalize the Tichy et al. (1981) strategic HRM conceptual framework. Perhaps other variables can be substituted to measure HR effectiveness. Tsui and Gomez-Meija (1988) provide an objective assessment of numerous HR effectiveness measures at various organizational and functional levels along the dimensions of process and outcome. Some of these measures may be more salient indicators of the HR effectiveness concept and potentially serve as useful predictors.

Second, the study provides insights into the efficacy of strategic human resource management and HR effectiveness variables as viable elements of contemporary models of organizations utilized for diagnostic or analytical

purposes. This has both theoretical and practical implications. A compelling argument can be made for auditing the strength and strategic capability of human resources in organizations in addition to evaluating the "fit" of structure, culture, tasks and people that are prominent in many contemporary diagnostic frameworks (e.g., the McKinsey 7-S framework, the Nadler-Tushman framework for analyzing organizational behavior).

For academicians, an important research question pertains to the nature, strength and direction of the relationships between the human resources management, performance, and the myriad contextual and organizational variables that have traditionally been the focal point of academic inquiry. Advocates of the contingency approach in particular should be encouraged by these findings and the opportunities they stimulate for the development of typologies or configurations to benefit theory and practice. Clearly, the emerging field of strategic human resource management offers bountiful research opportunities both from intra- and inter-disciplinary perspectives.

Practical Implications.

The practical implications the study offers are also many in number. First of all, the findings derived from this study support the importance of human resources as a viable contributor to strategic objectives and organizational performance. In today's globally competitive market place, the HR function is increasingly being called upon to

demonstrate its value-added, contribute to both strategy formulation and implementation, and to be fiscally astute in the effective management of human assets. This research provides strong support for an emphasis on human resources management to <u>drive</u> organizational performance and goal attainment. It suggests that there is a payoff. It emphasizes the importance of the control and coordination of human assets to achieve strategic objectives. It also implicitly, if not explicitly provides support for the importance of in-house HR audits designed to assess the role, strategic orientation, and contributions of the HR function to the attainment of organizational goals.

In ECG's case, the results lend themselves to developing a comprehensive systems approach to human resource management. The cross-sectional and cross-lagged regression results are informative in identifying which of the strategic HRM practices and orientations (strategic, managerial, or operational) might be most useful for facilitating the attainment of specific performance goals. For example, compelling support is provided for leveraging management development and career planning along with effective strategic HRM if the specific goal is short-term ROI. Under conditions of fluctuating revenue growth, where should emphasis be placed--on strategic, managerial and/or operational human resources management? The findings suggest that an emphasis on planning and development as well

as strategic and operational HR effectiveness appears to be important if the target is revenue growth.

But as the 1982 study provided pre-intervention base-line data, stronger support for the contributions of specific HR practices in driving financial performance and productivity will more likely materialize from an empirical examination of the effects of the 1985 HRM variables on subsequent performance. I remain hopeful that problems that prevented these data from inclusion in the analyses conducted for this thesis will be resolved.

Limitations of the Study

While the ECG case study provided useful insights into the longitudinal relationship between strategic human resource management, HR Effectiveness and Organizational Performance, it is not free from methodological flaws that potentially impact the strength and generalizability of the findings. In this section, the various limitations of the study are identified and discussed.

The Case Study Approach/Sample Size.

Although this approach to the study of organizational performance and human resource management is common, it is subject to the dilemma of sacrificing precision and generalizability for realism of context (McGrath, 1982). Karl Weick (1969), too, argued that while case studies have "a richness of detail, they have at least four drawbacks: They are (1) situation-specific, (2) ahistorical, (3) tacitly prescriptive, and (4) one sided" (p.18).

Concerted efforts were made to overcome many of these deficiencies, with limited success. Some consideration was given to history, context, content and process issues as they related to changes in strategic human resource management in ECG, though admittedly, much less than is desirable. Second, efforts were made to shun prescriptions vis-a-vis the "one best way" to strategically manage human resources and improve HR effectiveness. Third, the utilization of multiple sources of data to unravel the ECG SHRM story in comparing 1982 results to those of 1985 reduces the "one-sidedness" that Weick intimates impairs the objectivity and rigor of this methodological approach.

Following Jick's (1979) suggestion, multiple methods were used to collect these data to attain greater precision of measurement. Also, multiple levels of analysis were involved. ECG as a <u>total organization</u> was not the unit of analysis. Rather, the eleven <u>business units</u> comprising the organization as profit centers served as one unit of analysis, the individual level as the other. Though a counter argument would state that the senior managers were part of the ECG top management team, the diversity of the units in terms of mission and strategy, structure, technology, product groups, geographical locations, distinctive competencies, and life cycle stage provide compelling support for the ability to generalize these findings to other firms within its core industries. This

helps resolve the second dilemma McGrath asserts most case studies suffer from.

Consequently, the ECG business units are a diverse group. From another methodological viewpoint, perhaps they are too heterogeneous. Uncontrolled heterogeneity can be a double-edged sword as evidenced by the spurious effects caused by the outlier in the correlational analyses including the total sample. Even though the business units are part of one larger organization, their diversity may influence the strength, patterns, and direction of the relationships that have been the focal point of this thesis.

Critics argue that the value-added of a sample of n=1 is questionable. Advocates of case studies argue otherwise, and I agree. However, the true test of any scientific experiment's utility is <u>replicability</u>. Are the findings derived from this study generalizable within the organization's industry? In other industries? Conducting further studies of strategic human resource management building from the experiences and findings derived from this study can only enhance our comprehension of this complex phenomenon and its interdependence with other organizational systems.

<u>Scope of the Study</u>

The research conducted with Sterling's Electronics components business was quite broad in scope and complex in design. Two different conceptual frameworks were utilized in the data collection process and an array of survey,

interview, archival (both proprietary and nonconfidential) and public domain data were collected.

Given the exploratory nature of the study, this approach is justifiable, though there were tradeoffs. Little was disregarded or left to chance in pursuing a systems approach to studying strategic human resource management and HR effectiveness and their interdependencies/relationships with other organizational systems and variables. The outcome was 1) the consideration of the myriad variables interdependent with SHRM, 2) the intensive exploration of the complexity and machinations of the strategic HRM change process. The trade-off was analytical complexity and some precision of measurement.

<u>Conceptual Issues</u>

Strategic human resource management involves a set of complex factors which is supported by the mixed empirical results concerning certain relationships between SHRM and the performance variables. However, constructs that may moderate the relationships between SHRM and performance depicted in the model have been downplayed. For example, structure and culture were considered strategic "tools" that HRM can use to facilitate strategy implementation. From another perspective, measures of structure and culture as internal contextual variables would potentially have been useful in helping to explain more of the variance in the performance measures. Strong support has been provided for the efficacy of structure and culture as potentially potent

predictors of performance (Lawrence and Lorsch, 1967; Denison, 1982, 1984).

In addition, the cross-sectional relationship between the financial performance and productivity measures and the HRM variables were omitted from the model and the analyses that were conducted. These linkages, in retrospect, are important. The results of the analyses conducted to explore the linkages would indicate whether the emergence of the greater number of financial performance and productivity variables was consistent over time or a fluke associated with other contextual factors.

Thus, the conceptual limitations of the research presented here largely pertain to excluded variables and the moderating effects of the variables that were not considered. The focal point of this thesis was more oriented toward theory testing than theory building. Consideration of these other variables and hypothesized relationships between them would contribute to expanding the theoretical boundaries of the field of strategic human resource management.

Data Collection Process

Given the complexity of design and comprehensive nature of the study, various sources of data were explored. Was all of it used or necessary? Were the means employed effective and efficient? Yes and no. As mentioned in the methods chapter, I conducted all of the Wave 2 interviews myself. There are advantages and disadvantages to this

approach. First, I became quite familiar with the organization and managers occupying positions within the top two levels who were interviewed. I had also interviewed some of these same people in 1982 and the continuity/familiarity proved to be an advantage in facilitating the process and collecting rich data. Personally conducting the interviews also ensured uniformity in collecting and interpreting the data, but couldn't totally control for subjectivity.

While the data collection methods allowed me to gain rich insights into progress being made toward strategic human resource management in ECG through the eyes of those guiding and/or experiencing the process, they were somewhat less than efficient. The interview schedule exacted a cost in time I otherwise would have had available for analyses and reporting back results to meet the tight schedule that was imposed. As such, the gap in time between data collection and feedback could have been narrowed, potentially contributing to the facilitation of the action planning process in a more timely manner. Trading off a minor slippage in the project schedule for precision of measurement, in my view, was well worth the quality of data that was yielded. Nonetheless, more staff support in managing a project of this magnitude would have ameliorated the timing problem and was a lesson painfully learned.

In addition, the study didn't allow for the exploration of the relationship between the HRM variables and other

pertinent performance indicators such as Return on Capital, Return on Equity, and Return on Assets as these data were not available for research purposes. Stronger relationships might have been evident due to the longer range stability of these measures compared to the less stable return measures employed in this study. Also sorely missing for various reasons were measures of business strategy for the business units. Though the process of strategic planning has undergone extensive change and development, the collection of even fairly basic perceptual measures such as those incorporated in the Miles and Snow (1978) or Porter (1980) typologies would have at least permitted the exploration of the relationships between the HRM variables and these measures.

End Users

The sample for both Wave 1 and Wave 2 was the top three levels of management in ECG as it was felt that these people would be familiar with the strategic initiatives of their business units. It would also have been fruitful to collect data at lower levels in the organization related to the organization's context, culture, quality of HR practices and effectiveness of delivery, among others. This would have allowed for better control of response bias and provided more valid data from the perspective of the end user of HR services at lower levels in the organization. Should a third wave be conducted, which I very much would like to be involved in, surveying a sample that would include

management down to supervisory levels in the organization would be advantageous.

<u>Survey Instrumentation</u>

Using a questionnaire to <u>solely</u> collect conceptually difficult or potentially complex data should be a strategy of the last resort. The conceptual frameworks individually introduced to wave 1 study participants were folded into the wave 2 questionnaire. Though the reliability of the scales that were developed were within an acceptable range, arguably the quality of these data could have been improved through their inclusion in the interview guide. Other creative methods for accurately collecting these data warrant consideration for those interested in utilizing these concepts for research purposes.

Future Directions for Research

What's potentially significant about this study is that the findings represent an initial step in developing a clearer understanding of relationships between strategic human resource management, the effective management of human resources, and organizational performance. Of course, the true test of good empirical research is its replicability. Thus, one fruitful research direction is to examine whether these findings can be replicated in research conducted in other firms. An appropriate starting point would be firms operating in the same industry and subject to the same environmental constraints as ECG. Of course, this approach should not exclude opportunities to examine similar

relationships within the context of other organizations as well. As such, this stream of research should provide for more conclusive evidence regarding the direction and strength of the relationship between strategic human resource management, HR effectiveness, and organizational performance and suggest fruitful avenues to explore regarding the inclusion of other variables in the model.

Related research questions that might prove interesting for scholarly inquiry include the following: What combination of mutually supportive and integrated practices comprising the menu of HR choices are most appropriate or congruent with mission and strategy, organizational structure, control systems, technology and culture? Which variables or combination thereof are strong predictors of ROI and other financial performance and productivity measures? Why are HRM practices significant predictors of cross-sectional productivity but seemingly have little impact on long-term productivity? How can HR practices be effectively utilized to implement strategy and which ones under what conditions? These are some of the questions stimulated by the research findings reported in this thesis that provide opportunities for both scholarly and practical inquiry.

The ECG experience has been rewarding in stimulating my interest in these relationships. The examination of the relationships between the 1985 HRM variables and subsequent performance provides an opportunity to empirically examine

these issues in greater depth. If it is possible to conduct these additional analyses, then a more accurate assessment of the lagged effects of the post-intervention HRM indices on financial performance and productivity can be made. Conducting a third wave of data collection would help unravel the confusion regarding reciprocal causality and directionality evident in some of the relationships between the HRM indices and the performance measures and potentially generate more conclusive results. This is an opportunity that I hope looms large in the future.

To pursue a point made earlier, though these business units are affiliated with one organization, considerable diversity is evident--human resources effectiveness and performance results represent two of several dimensions where there is variability. Employing a configurational approach as suggested by Miller and Friesen (1984), would potentially result in a clustering among organizational variables that is statistically significant and predictively useful and that reduces the variety of organizations to a small number of rich configurations or types. This approach may yield more significant findings and greater insights into the relationships between these variables as other important variables are controlled for.

From another perspective, this research focused on a series of quite specific relationships between HRM variables and financial performance and productivity variables. As discussed above, other relevant organizational/contextual

variables were excluded from the equation. Figure 7.1 provides a more detailed Strategic HRM Conceptual Model that is comprised of a number of contextual, HR performance, and organizational performance variables that were collected as part of this action research project. My personal research agenda involves empirically testing the specific relationships between the constructs in the model and contributing to the dearth of studies providing empirical support for the efficacy of strategic human resource management and its interdependencies/relationships with other organizational systems and variables. A second, considerably larger data base I have been constructing allows for more intensive analyses regarding these relationships though its cross-sectional orientation precludes the examination of causal relationships.

A fourth area of fruitful scholarly inquiry related to the theoretical and practical application of strategic human resource management is interdisciplinary in its approach-- bridging the strategic HRM, organizational development, organizational culture and strategic change management areas and finding points of intercision that allow for the empirical examination of the myriad variables involved in orchestrating large-scale organizational change (Tichy, 1983; Burke, 1987; Beer and Walton, 1987). Unequivocally, there is an important contribution that strategic human resource management can make to understanding and facilitating the strategic change management process. These

STRATEGIC HRM CONCEPTUAL MODEL

CONTEXTUAL VARIABLES

BUSINESS UNIT ENVIRONMENT

-RESOURCE SCARCITY
-GOVERNANCE
-EMPLOYEE DISCORD

ORGANIZATIONAL CULTURE

-CREATIVE/ INNOVATIVE
-PRODUCTIVITY/ QUALITY
-TRUST/OPENNESS
-CONFLICT
-AUTHORITY
(MOSTLY 1985 DATA)

HRM ENVIRONMENT

-EXTERNAL FACTORS
-FORMAL STRUCTURE
-HR ROLE/IMAGE

HRM PERFORMANCE VARIABLES

HR-STRATEGY LINKAGE

STRUCTURE/CULTURE PLANNING/DEVELOPMENT/SELECTION/ ASSESSMENT

HR QUALITY

PLANNING, STAFFING, DEVELOPMENT EMPLOYEE INVOLVEMENT (1985 ONLY)

HR EFFECTIVENESS

STRATEGIC, MANAGERIAL AND OPERATIONAL HR EFFECTIVENESS

HR PERFORMANCE

HRM FUNCTIONAL PERFORMANCE

ORGANIZATIONAL PERFORMANCE VARIABLES

1982 – 1985 ORGANIZATIONAL PERFORMANCE

REVENUE GROWTH OPERATING PROFIT RATE, ROI AVG. INVESTMENT RATE

1982 – 1985 ORGANIZATIONAL PRODUCTIVITY

SALES TO PAY, SALES PER EMPLOYEE, VALUE ADDED SALES PER EMPLOYEE, GROSS INVENTORY RATE, SCRAP/REWORK RATE

research streams and opportunities offer both promises and challenges.

Finale

The research conducted for the purpose of this thesis represents one of the few longitudinal empirical investigations of the relationships between strategic human resource management, human resources effectiveness and organizational performance. In some respects, it represents the cornerstone of a foundation on which a new paradigm regarding strategic human resource management and organizational performance may be constructed.

Though we cannot calculate with mathematical precision the relationships between ECG's SHRM policies and practices and performance variables, we can use the ECG action research study along with other case studies (e.g., Chandler, 1962) to identify new and emerging patterns of human resource management that optimize individual, organizational, and societal development. Prior to commencing with these scholarly inquiries, however, it's time for a few post-doctoral adventures!

APPENDIX

APPENDIX A

ECC STRATEGIC HUMAN RESOURCE MANAGEMENT
ACTION RESEARCH STUDY QUESTIONNAIRE:
WAVE 2

HUMAN RESOURCE EFFECTIVENESS SURVEY

This questionnaire is being used to collect opinions and attitudes regarding human resource management in Sterling 's ECG Business. It is part of a follow-up study that ECG's Human Resources Council is committed to for the purpose of evaluating the effectiveness of human resource practices within the organization. To maximize the information that you can provide via this questionnaire, we will ask for your opinions about several features of ECG: human resource management practices, ECG's culture, business constraints, and strategy formulation.

Some of our questions are asked about ECG as a whole, the ECG Group you may be affiliated with, and the ECG unit in which you work. If your business unit is ECG (e.g., you occupy a business staff position), then all questions refer to ECG. If your business unit is ECG Group (e.g., you occupy an ESG-1 or ESG-2 Group level position), then all questions refer to ECG.Group. If you are affiliated with a specific ECG Business Unit, then please indicate what your business unit is in the space provided below:

(YOUR BUSINESS UNIT)

NOTE: If you are in Human Resources, questions about your business unit refer to the business you serve, and not to HR as a business itself.

Your answers to this questionnaire will be strictly confidential: no one at ECG will have access to individual responses. The answers will be computer processed and summarized in statistical form. All data processing will be done at The University of Michigan. Each individual will be assigned a personal code number which will make it possible for us to keep track of returned questionnaires and match them with interviews--no one at ECG will have access to these code numbers.

We would greatly appreciate your participation in answering each question as best you can. Above all, it is important that your answers be frank and honest; there are no "right" or "wrong" answers.

This information is being collected for ECG's Human Resources Council by Professor Noel Tichy and Chet Borucki, a research associate and doctoral candidate at The University of Michigan.

When you are done, please seal the questionnaire in the accompanying envelope and place it in the mail. Thank you in advance for your cooperation. We hope you will find the questionnaire interesting and thought provoking.

Noel Tichy   Chet Borucki

I.D. NUMBER: _____

Date _____

ECG HUMAN RESOURCE EFFECTIVENESS SURVEY

SECOND WAVE SURVEY PERSONAL INFORMATION

ECG Business Unit _____

ECG Group (if applicable) _____

Title _____

Department _____

Location _____

Salary Grade _____

Age _____

Sex _____

Tenure at Sterling _____

Tenure in the Unit
You Presently Work In _____

Tenure in Current Job _____

Name of Individual To
Whom You Currently Report _____

The following terms are ones that you will encounter when completing this survey and which may mean different things to different people. To prevent any confusion, we ask that in answering any questions dealing with these terms, you use the definitions that we have provided below:

Political, politics -- refers to how resources are allocated. Deals with issues of who gets ahead, who gets and controls things, who gets what rewards, etc.

Culture -- the norms and values which characterize an organization.

Human Resource Management -- refers to the selection, staffing, appraisal, reward, and training and development of people within the organization.

Strategy, strategic -- refers to long-range issues, usually 5 or more years into the future.

Management, manager -- when we use these terms, we are not referring to any one level of management within ECG but rather management in general.

There are two parts to this survey. In Part I, we ask for your opinions regarding current human resource practices and related issues mostly in terms of quality and effectiveness. In Part II, we ask for your opinions regarding more strategic (long term) issues as they pertain to human resource management practices in ECG.

PLEASE READ EACH QUESTION CAREFULLY BEFORE RESPONDING

PART I: ECG HUMAN RESOURCE EFFECTIVENESS

Your unit refers to one of three levels that were described in the introduction:
ECG, Group, or Business Unit. Please fill in the blank with the unit most appropriate
to your position:

UNIT _____

---

1. For the following, indicate the extent to which Human Resources in your unit is
   currently and should in the future be engaged in each activity. CIRCLE THE NUMBER
   CORRESPONDING TO YOUR RESPONSE:

	Is currently doing					Should do in the future				
	little extent				great extent	little extent				great extent
a. Working to look for new types of clients (e.g., targeting subgroups such as older employees for retraining)	1	2	3	4	5	1	2	3	4	5
b. Working to increase the number of clients similar to the ones HR currently services	1	2	3	4	5	1	2	3	4	5
c. Working to decrease the number of clients similar to the ones HR currently services	1	2	3	4	5	1	2	3	4	5
d. Working to improve the quality of existing services	1	2	3	4	5	1	2	3	4	5
e. Working to develop new services	1	2	3	4	5	1	2	3	4	5
f. Working to decrease the number of services	1	2	3	4	5	1	2	3	4	5
g. Working to maintain current level of activity	1	2	3	4	5	1	2	3	4	5
h. Working to develop future ECG Human Resources managers	1	2	3	4	5	1	2	3	4	5
i. Working to upgrade the competence of professionals in ECG Human Resources	1	2	3	4	5	1	2	3	4	5
j. Working to make optimal utilization of the computer for Human Resources work	1	2	3	4	5	1	2	3	4	5
k. Working to be better integrated with the business	1	2	3	4	5	1	2	3	4	5

The activities listed below may be conducted by line management, Human Resources
management, or both in your unit.

2. For each of the following, rate (1) the current quality of that activity, (2)
   your desired level of quality, and (3) how well Human Resource Management (HRM)
   in your unit supports that activity. CIRCLE THE NUMBER CORRESPONDING TO YOUR
   RESPONSE.

		Current Quality					Desired Quality					How Well HRM In Your Unit Supports This Activity				
		low				high	low				high	poor				excellent
a.	Forecasting human resource needs	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
b.	Recruiting	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
c.	Employment selection and staffing	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
d.	New employee orientation	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
e.	Employee Recognition	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
f.	Assuring suitability of job assignments	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
g.	Compensation	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
h.	Performance management (appraisals, improvement)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
i.	Skills training	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
j.	Professional development	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
k.	Management development	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
l.	Career management	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
m.	Succession planning	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
n.	Human Resources planning	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
o.	Employee productivity initiatives	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
p.	Human Resources information systems (employee data)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
q.	Utilization of non-full time employees	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
r.	Employee communication	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
s.	Employee involvement	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
t.	Affirmative action	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
u.	Managing to Sterling Principles	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
v.	Human Resources policies and procedures	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
w.	Organization Design initiatives	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
x.	Employee assistance programs	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
y.	Health and safety programs	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
z.	Employee cost management	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
aa.	Meeting employee needs (advocacy)	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

3. Please rate the performance of Human Resources in your unit over the past year on the following:

		inadequate				outstanding
a.	Caliber of work produced/accomplished 1		2	3	4	5
b.	Demonstrated knowledge of techniques and skills used to increase employee productivity 1		2	3	4	5
c.	Reliability in carrying out commitments 1		2	3	4	5
d.	Ability to relate effectively and productively with other units 1		2	3	4	5
e.	Integration with other functional areas in the business 1		2	3	4	5
f.	Ability to generate worthwhile and new ideas with practical applications 1		2	3	4	5
g.	Ability to plan effectively 1		2	3	4	5
h.	Quantity of work performed 1		2	3	4	5
i.	Profit and cost sensitivity 1		2	3	4	5
j.	Influence on employee morale 1		2	3	4	5
k.	Reputation for work excellence 1		2	3	4	5
l.	Cooperation with other Sterling groups 1		2	3	4	5
m.	Responsiveness to employee needs through HR policies and procedures 1		2	3	4	5
n.	Overall evaluation of HR's performance 1		2	3	4	5

4. In your view, how are Human Resources staff in general regarded by senior line management in your unit?

	only looked to for operational (day-to-day) personnel services	mostly looked to for operational services but sometimes for strategic	looked to for operational and strategic services	looked to somewhat for operational but more for strategic	totally looked to for strategic services
How it is now:	1	2	3	4	5
How I think it should be:	1	2	3	4	5

The following questions focus on the values and norms that characterize your unit:

		little				great
5.	To what extent does your unit's culture (its norms and values) affect its business performance? 1		2	3	4	5
6.	To what extent is your unit's culture affected by human resource management practices (staffing. appraisal. development. and rewards)? 1		2	3	4	5

7. For the following items, indicate 1) the extent to which each is _currently_ characteristic of your unit and 2) the extent to which you think it _should_ be characteristic of your unit:

		Currently Characteristic					Should be Characteristic				
		little extent				great extent	little extent				great extent
a.	Progressive	1	2	3	4	5	1	2	3	4	5
b.	Confrontational	1	2	3	4	5	1	2	3	4	5
c.	Paternalistic	1	2	3	4	5	1	2	3	4	5
d.	Entrepreneurial	1	2	3	4	5	1	2	3	4	5
e.	Competitive with other units	1	2	3	4	5	1	2	3	4	5
f.	People-oriented	1	2	3	4	5	1	2	3	4	5
g.	Political	1	2	3	4	5	1	2	3	4	5
h.	Bureaucratic	1	2	3	4	5	1	2	3	4	5
i.	Competitive between individuals	1	2	3	4	5	1	2	3	4	5
j.	Socially responsible	1	2	3	4	5	1	2	3	4	5
k.	Concern for customer	1	2	3	4	5	1	2	3	4	5
l.	Concern for quality	1	2	3	4	5	1	2	3	4	5
m.	Creativity and ingenuity	1	2	3	4	5	1	2	3	4	5
n.	Profit oriented	1	2	3	4	5	1	2	3	4	5
o.	Company pride	1	2	3	4	5	1	2	3	4	5
p.	Clear lines of authority	1	2	3	4	5	1	2	3	4	5
q.	Centralized decision making	1	2	3	4	5	1	2	3	4	5
r.	Trust	1	2	3	4	5	1	2	3	4	5
s.	Cooperative	1	2	3	4	5	1	2	3	4	5
t.	Open and frank communication	1	2	3	4	5	1	2	3	4	5
u.	Employee participation in decision making	1	2	3	4	5	1	2	3	4	5
v.	Information sharing with subordinates	1	2	3	4	5	1	2	3	4	5
w.	Innovative	1	2	3	4	5	1	2	3	4	5
x.	Ethical	1	2	3	4	5	1	2	3	4	5
y.	Concern for productivity	1	2	3	4	5	1	2	3	4	5
z.	Technically state-of-the-art	1	2	3	4	5	1	2	3	4	5
aa.	Effective leadership	1	2	3	4	5	1	2	3	4	5

PART II: STRATEGIC HUMAN RESOURCE MANAGEMENT IN ECG

> 1. The following question concerns the issues which ECG as a whole must resolve now and in the future to be successful. Please indicate <u>the extent</u> to which you feel each of the following factors is a constraint on ECG's overall performance:

		not a constraint				very great constraint
a.	Lack of opportunities for employees to grow and develop	1	2	3	4	5
b.	Lack of cooperation among employees (e.g., inter-departmental squabbles, poor teamwork)	1	2	3	4	5
c.	Shortage of technical expertise (e.g., shortage of qualified engineers, scientists, accountants, etc.)	1	2	3	4	5
d.	Lack of investment in/adoption of state-of-the-art technology	1	2	3	4	5
e.	Shortage of managerial talent	1	2	3	4	5
f.	Managerial resistance to change...........	1	2	3	4	5
g.	Human Resources policies and procedures	1	2	3	4	5
h.	Labor relations issues (productivity, contract provisions)	1	2	3	4	5
i.	General community attitude about ECG	1	2	3	4	5
j.	Government regulations	1	2	3	4	5

> 2. The following factors are part of the environment of Human Resources in ECG. Please rate the <u>extent</u> to which each factor impacts Human Resources' ability to carry out its responsibilities for <u>ECG</u> <u>as</u> <u>a</u> <u>whole</u>:

	very little				very great
a. Top ECG management 1	2	3	4	5
b. ECG middle management 1	2	3	4	5
c. ECG personnel below managerial levels 1	2	3	4	5
d. Government regulations 1	2	3	4	5
e. Labor market 1	2	3	4	5
f. The image of HR in ECG 1	2	3	4	5
g. Sterling Corporate HR 1	2	3	4	5
h. Sterling Corporation 1	2	3	4	5
i. The economy 1	2	3	4	5
j. Organization structure of ECG 1	2	3	4	5
k. Changing lifestyles 1	2	3	4	5
l. Technology changes 1	2	3	4	5

3. For each of the following items, indicate the <u>amount of change</u> you feel will be required from ECG over the next five years for the company to be successful.

		little change			great deal of change
a.	Defining what business(es) we are in and determining ECG's business strategy	1	2	3	4	5
b.	Determining who gets to influence the strategy of ECG	1	2	3	4	5
c.	Developing a culture, or set of values, to support ECG's business strategy	1	2	3	4	5
d.	Designing an organizational structure (defining reporting relationships and groupings of people in departments) to meet ECG's business needs	1	2	3	4	5
e.	Redistributing the amount of influence that key individuals have within ECG to meet business needs	1	2	3	4	5
f.	Developing a management style and culture to meet ECG's business needs	1	2	3	4	5
g.	Developing more effective methods of managing human resources (staffing, appraising, training, developing, and rewarding people within ECG)	1	2	3	4	5
h.	Managing the politics of human resource practices (e.g., succession, rewards, appraisal, and development)	1	2	3	4	5
i.	Designing human resource systems to support ECG's culture.......................	1	2	3	4	5

4. In determining Human Resources' mission and strategy, please indicate <u>how influential</u> you feel each of the following is:

	not at all influential			extremely influential
a. The Executive Vice President of ECG............. 1		2	3	4	5
b. The Group Executive 1		2	3	4	5
c. The Division General Manager 1		2	3	4	5
d. The Manager of Human Resources at Group Level................................... 1		2	3	4	5
e. The Human Resources Director at the Business Unit level..................... 1		2	3	4	5
f. Users/clients of Human Resources' services.. 1		2	3	4	5
g. Sterling Corporation Human Resources staff................................. 1		2	3	4	5
h. Historical precedent........................... 1		2	3	4	5
i. External factors (government regulation, the economy, etc.)................. 1		2	3	4	5

The following questions pertain to the role of human resource issues in ECG's strategic planning and implementation processes at three levels in the organization. If you feel that you cannot answer for a particular organizational level from your position in ECG, circle NA:

5. To what extent are human resource issues included in strategic planning efforts for...

	little				great	
a. ECG?	1	2	3	4	5	NA
b. Group Level?	1	2	3	4	5	NA
c. Business Unit Level?	1	2	3	4	5	NA

6. To what extent should human resource management issues be considered during strategic planning efforts for...

a. ECG?	1	2	3	4	5	NA
b. Group Level?	1	2	3	4	5	NA
c. Business Unit Level?	1	2	3	4	5	NA

7. To what extent are human resource activities used to facilitate strategy implementation in...

a. ECG?	1	2	3	4	5	NA
b. Group Level?	1	2	3	4	5	NA
c. Business Unit Level?	1	2	3	4	5	NA

8. To what extent should human resource activities be used to facilitate strategy implementation in...

a. ECG?	1	2	3	4	5	NA
b. Group Level?	1	2	3	4	5	NA
b. Business Unit Level?	1	2	3	4	5	NA

9. Below are human resource areas in which ECG might compile information. For each area, indicate the extent to which the data are used and the extent to which the data should be used for strategic and organizational planning. If data do not exist for a particular area, circle NA.

	Extent to which data are used						Extent to which data should be used				
	low			high			low				high
a. External manpower studies, data on national demographic trends	1	2	3	4	5	NA	1	2	3	4	5
b. Inventory of current managerial talent	1	2	3	4	5	NA	1	2	3	4	5
c. Inventory of ECG's future managerial talent for at least the top four levels of management	1	2	3	4	5	NA	1	2	3	4	5

		Extent to which data _are_ used						Extent to which data _should_ be used				
		low			high			low				high
d.	Inventory of technical talent for senior professional and key individual personnel	1	2	3	4	5	NA	1	2	3	4	5
e.	Information on required or desired management development activities	1	2	3	4	5	NA	1	2	3	4	5
f.	Succession plans for top three levels of management	1	2	3	4	5	NA	1	2	3	4	5
g.	Management audit of human resources in companies considered for acquisition	1	2	3	4	5	NA	1	2	3	4	5

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10. Below are various human resource management practices which may be used to facilitate strategy implementation. Please indicate 1) the extent to which they _are_ used in ECG as tools for implementing strategy and 2) the extent to which they _should_ be used.

		Extent to which practice _is_ used					Extent to which _should_ be used				
		little			great		little			great	
a.	Matching key managers to strategic goals	1	2	3	4	5	1	2	3	4	5
b.	Identifying the necessary managerial characteristics needed to meet strategic goals	1	2	3	4	5	1	2	3	4	5
c.	Modifying reward systems (financial and nonfinancial) to motivate managers to attain strategic goals....	1	2	3	4	5	1	2	3	4	5
d.	Assessing the potential of managers for attaining strategic goals.........	1	2	3	4	5	1	2	3	4	5
e.	Conducting management development programs to support strategic goals..	1	2	3	4	5	1	2	3	4	5
f.	Establishing career planning processes to help develop managerial talent....	1	2	3	4	5	1	2	3	4	5
g.	Changing ECG's culture to fit strategic goals	1	2	3	4	5	1	2	3	4	5
h.	Modifying organizational structure to fit strategic goals....	1	2	3	4	5	1	2	3	4	5
i.	Changing internal staffing patterns to help implement new strategies....	1	2	3	4	5	1	2	3	4	5
j.	Succession plans for top three levels of company management	1	2	3	4	5	1	2	3	4	5

The following set of questions ask about human resource management practices within ECG at three levels of activity. These are defined as follows:

STRATEGIC LEVEL ACTIVITY

o tends to be long term (generally 3 to 5 years in the future)

o supports business policy formulation and overall goal setting

o concerns what people are needed to run the business in the future and the alignment of human resources to fit business strategy

---

MANAGERIAL LEVEL ACTIVITY

o tends to be mid-range (generally a 1 to 2 year time span)

o concerns acquiring and allocating resources and developing programs for the purpose of attaining strategic objectives

o focuses on coordinating work over a 1 to 2 year time period for meeting strategic goals

---

OPERATIONAL LEVEL ACTIVITY

o tends to be short-term (day to day)

o supports daily business operations and management of the organization

o concerns the actual decisions made to drive business operations (e.g., staffing, performance evaluations, compensation, training and development, etc.)

These questions ask about human resource management practices within ECG at the strategic, managerial, and operational levels of activity. Please refer to the the definitions provided above for clarification as you answer these questions:

11. How effective is ECG's staffing/selection process in assuring that people are properly placed in positions to carry out...

	not effective				very effective
a. strategic level activities.........................	1	2	3	4	5
b. managerial level activities........................	1	2	3	4	5
c. operational level activities.......................	1	2	3	4	5

12. How effective are ECG's performance appraisal systems in accurately assessing performance of...

a. strategic level activities.........................	1	2	3	4	5
b. managerial level activities........................	1	2	3	4	5
c. operational level activities.......................	1	2	3	4	5

13. How effective are rewards (financial & nonfinancial) in motivating people to work hard in ECG on...

a. strategic level activities.........................	1	2	3	4	5
b. managerial level activities........................	1	2	3	4	5
c. operational level activities.......................	1	2	3	4	5

	not effective				very effective

14. How effective are ECG's training and development practices in motivating performance for...

   a. strategic level activities......................... 1   2   3   4   5

   b. managerial level activities....................... 1   2   3   4   5

   c. operational level activities...................... 1   2   3   4   5

15. How effective are ECG's performance appraisal systems in differentiating levels of performance to allow justification of reward allocations for...

   a. strategic level activities......................... 1   2   3   4   5

   b. managerial level activities....................... 1   2   3   4   5

   c. operational level activities...................... 1   2   3   4   5

16. How effective are ECG's appraisal systems in identifying training needs of employees to guide their development and career planning for managing..

   a. strategic level activities......................... 1   2   3   4   5

   b. managerial level activities....................... 1   2   3   4   5

   c. operational level activities...................... 1   2   3   4   5

17. How effective are ECG's training and development practices in preparing people for placement into new positions requiring performance of...

   a. strategic level activities......................... 1   2   3   4   5

   b. managerial level activities....................... 1   2   3   4   5

   c. operational level activities...................... 1   2   3   4   5

18. Overall, how effectively are the human resource components integrated and mutually supportive of..

   a. strategic level activities......................... 1   2   3   4   5

   b. managerial level activities....................... 1   2   3   4   5

   c. operational level activities...................... 1   2   3   4   5

The following questions ask about the impact HR policies and practices have on the effectiveness of your unit:

	no extent				great extent

19. To what extent do human resources policies and practices impact the effectiveness of your unit? 1   2   3   4   5

20. To what extent should human resources policies and practices impact the effectiveness of your unit? 1   2   3   4   5

21. Indicate the extent to which each of the following is being done to develop Human Resource's ability to deal with ECG's strategic issues:

		no extent				great extent
a.	using appropriate selection criteria in hiring Human Resource staff 1		2	3	4	5
b.	having specific strategic developmental activities for Human Resource staff 1		2	3	4	5
c.	rewarding Human Resource staff for their performance of strategic activities 1		2	3	4	5
d.	involving Human Resource staff in line/ business planning and operations 1		2	3	4	5

This concludes the formal part of the questionnaire. Please feel free to use the space below for any comments or suggestions. When you are done, please place your completed survey in the return envelope that is provided and put the envelope in the mail. **THANK YOU FOR YOUR COOPERATION.**

APPENDIX B

UNIVARIATE ANALYSES: WAVE 1 AND WAVE 2 VARIABLES

Table B.1 Descriptive Measures: Wave 1 Variables

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV	SKEWNESS
V537	106	1.0000	5.0000	2.6415	.97774	-.155
V539	106	1.0000	5.0000	2.6321	.99834	.152
V541	106	1.0000	5.0000	1.9528	.84382	.854
V543	105	1.0000	4.0000	2.3238	.90400	.181
V545	106	1.0000	5.0000	2.3019	.92757	.375
V547	106	1.0000	4.0000	2.1509	.94408	.446
V553	105	1.0000	5.0000	2.5429	.96105	.041
V557	107	1.0000	5.0000	3.1308	1.0910	-.480
V560	107	1.0000	5.0000	2.7477	1.0736	.009
V563	104	1.0000	5.0000	2.5962	1.0289	.224
V566	104	1.0000	5.0000	2.5962	1.0750	.197
V569	105	1.0000	5.0000	2.5333	1.0102	.190
V572	105	1.0000	5.0000	2.5238	1.1189	.354
V575	105	1.0000	5.0000	2.6857	1.0499	-.147
V578	101	1.0000	5.0000	2.6139	.91639	-.104
V558	105	1.0000	5.0000	3.0476	.95455	-.028
V561	103	1.0000	5.0000	2.8155	.99752	.137
V564	103	1.0000	5.0000	2.8447	1.1004	-.123
V567	103	1.0000	5.0000	3.0194	.96995	-.039
V559	109	1.0000	5.0000	3.4404	.87592	-.398
V562	107	1.0000	5.0000	2.6916	.98490	.350
V565	107	1.0000	5.0000	2.9907	.90591	.018
V568	107	1.0000	5.0000	2.8131	1.0106	.160
V571	105	1.0000	5.0000	2.9048	1.0240	.029
V574	105	1.0000	5.0000	2.8857	1.0126	.007
V577	103	1.0000	5.0000	2.6893	.98049	-.099
V580	101	1.0000	4.0000	2.8713	.79578	-.366

Table B.2 Descriptive Measures: Wave 2 Variables

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV	SKEWNESS
V537	143	1.0000	5.0000	2.6643	.95640	-.015
V539	142	1.0000	5.0000	2.4648	.81356	.154
V541	142	1.0000	5.0000	2.4366	.89494	.221
V543	142	1.0000	5.0000	2.4859	.89709	.072
V545	142	1.0000	5.0000	2.8099	.92202	-.106
V547	141	1.0000	5.0000	2.7021	.98376	.036
V549	141	1.0000	5.0000	2.5603	.92094	.097
V551	143	1.0000	5.0000	2.8671	1.0087	-.145
V553	143	1.0000	5.0000	2.6853	.86740	.068
V555	138	1.0000	5.0000	3.1449	1.0291	-.212
V557	143	1.0000	5.0000	2.5245	.87880	.269
V560	141	1.0000	4.0000	2.1418	.85006	.427
V563	143	1.0000	5.0000	2.1888	1.0874	.544
V566	141	1.0000	4.0000	2.5035	.88337	.208
V569	139	1.0000	4.0000	2.1007	.91124	.435
V572	140	1.0000	4.0000	2.1643	.87005	.400
V575	141	1.0000	4.0000	2.3688	.95667	.255
V578	140	1.0000	4.0000	2.2929	.88551	.330
V558	142	1.0000	5.0000	3.2042	.66885	-.401
V561	143	1.0000	4.0000	2.8671	.79822	-.342
V564	143	1.0000	5.0000	2.9161	.84334	-.336
V567	141	1.0000	5.0000	3.2411	.75499	-.528
V570	140	1.0000	5.0000	2.7786	.84025	-.150
V573	140	1.0000	5.0000	2.6857	.87397	-.125
V576	141	1.0000	4.0000	2.9787	.84910	-.311
V579	140	1.0000	4.0000	2.9714	.72908	-.627
V559	143	1.0000	5.0000	3.6573	.83164	-.765
V562	143	1.0000	5.0000	3.4336	.90817	-.509
V565	143	1.0000	5.0000	3.4895	.95584	-.431
V568	141	1.0000	5.0000	3.4184	.81202	-.257
V571	141	1.0000	5.0000	3.2695	1.0133	-.351
V574	141	1.0000	5.0000	3.0000	1.0142	-.371
V577	141	1.0000	5.0000	3.2979	.91608	-.454
V580	140	1.0000	5.0000	3.3357	.81894	-.528

APPENDIX C

FACTOR ANALYTIC RESULTS: WAVE 1 AND WAVE 2 VARIABLES

Table C.1 Exploratory Factor Analysis: Wave 1 Variables

Rotation of Factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITERATION	3.5745	10.526	11.004	11.021	11.023	11.023	11.023
CRITERION							

PAIRWISE VARIMAX ON 7 FACTORS WITH NORMALIZED LOADINGS

VARIABLE	COMMUNALITY	(1)	(2)	(3)	(4)	(5)	(6)	(7)
557.FI54S557	.69990	.71115	.27531	-.18423	.10477	.13333	-.12206 -1	-.23555
560.FI55S560	.77962	.83451	.14312	.93621 -1	-.47002	.21533	.60294 -2	-.72777 -1
563.FI56S563	.65380	.74822	.12254	-.24337	-.12367	.61628 -1	-.97806 -1	.79743 -1
566.FI57S566	.47160	.48599	.24339	.35271	-.16884	.76561 -1	.60459 -1	.11729
569.FI58S569	.58200	.72279	.69825	-.65847 -1	.18802	.29559 -1	-.33819 -1	.11398
572.FI59S572	.51104	.62833	.14467	.12650	.25961	.23050	.66198 -1	.14533
575.FI60S575	.52462	.63796	.12123	.27430	-.11136	-.41864 -1	.33559 -1	.11143
578.FI61S578	.88613	.90507	.14592	.15137	.11571	-.44689 -1	.49338 -1	.70403 -1
537.F315S537	.77514	.15308 -1	.84084	-.70663	.13734	.16423	-.63710 -1	.11405
539.F317S539	.54199	.15974	.66551	.57666	.18257	.12728	-.89108 -1	.11303
541.F319S541	.32152	.98557 -1	.40218	.19531 -1	-.24991 -1	.74209 -1	.21701	.31056
543.F323S543	.64842	.25280	.72933	-.18510 -2	-.48010 -1	.17454	.14064	.56008 -2
545.F325S545	.63167	.22583	.69232	.17936	.48842 -1	.24864 -1	-.10747	.23377
547.F327S547	.47960	.13091	.58777	.24525	.50828 -1	.20252	-.15086 -1	.11408
553.F321S553	.59856	.39090	.58065	-.62656 -1	.16245	.16715	.19561	-.10994
567.FI53S567	.35160	-.26934 -1	.14676 -1	.45070	.47758 -1	.86961 -1	.37038	-.22347 -1
568.FI45S568	.61723	.29091 -3	-.45610 -1	.72073	.10617	.51721 -1	.12754	-.25590
577.FI48S577	.63919	.12552	.18902	.69816	.18006	.18950	-.85341 -1	.15707
580.FI49S580	.70703	.48236 -2	.10084	.54406	.49877	.15563	.19934	.29684
562.FI43S562	.40947	.97112 -1	.36849 -1	.78906 -1	.58603	.15563	.10252	.11958
571.FI46S571	.47461	-.24602 -1	.77708 -1	.49277 -1	.65697	-.56759 -1	.95423 -1	.14699
574.FI47S574	.48169	.73651 -1	.14650	.34940	.46920	.33296	-.77440 -2	.40712 -1
558.FI50S558	.15121	.72247 -1	.14681	.14357	.55894	.27507	.14831	.55162 -1
559.FI42S559	.63917	.13117	.91748 -1	.18259	.16175	.72335	.27664 -1	.17332
561.FI52S561	.81469	.20051 -1	.95132 -1	.18457	.40646	.10506	.76385	.10701
564.FI51S564	.41380	.54197 -1	.21427	-.11582	.24196 -2	.28794	.59279 -1	.51489 -1
565.FI44S565	.26313	.12525	.26344	.95492 -1	.15409	.34842 -1	.19919 -1	.38544
SUM SQRS		4.5354	3.4692	2.1971	1.6982	1.1830	.98169	1.0089
% VARIANCE		16.8	37.8	24.9	44.1	48.5	52.1	55.8
% TOTAL VARIANCE		16.8	12.9	8.1	6.3	4.4	3.6	3.7
% COMMON VARIANCE		30.1	23.1	14.5	11.3	7.9	6.4	6.6

Table C.2 Exploratory Factor Analysis: Wave 2 Variables

```
Rotation of Factors
ITERATION   (1)   3.5219
CRITERION   (2)  10.116
```

PAIRWISE VARIMAX ON 7 FACTORS WITH NORMALIZED LOADINGS

VARIABLE	COMMUNALITY	(1)	(2)	(3)	(4)	(5)	(6)	(7)
557.FI54S557	.59815	.38867	-.31929 -1	.14819	.84790 -1	.63149	.13204	-.26449 -1
560.FI55S560	.64219	.71688	-.11525	.15790	.17856	.23261	.62912	-.10669 -1
563.FI56S563	.69929	.79355	-.90176 -2	.23441	-.10484	-.36590 -1	-.46541 -1	-.46744 -1
566.FI57S566	.78620	.53255	.77589 -1	.22239	.33324	.22410	.60445	.17442
569.FI58S569	.69986	.79744	-.15209	.13670	-.86562	.29189 -1	.72236 -1	.92601 -1
572.FI59S572	.61209	.67270	.12925	.13958	-.37904 -1	.90750 -1	.42190	.34033
575.FI60S575	.58857	.51173	.68898 -1	.18745	.19298	.24342	.36424	.27076
578.FI61S578	.67908	.65610	-.10685 -1	.23347	.37174 -1	.30692	.19551	.28205
559.FI42S559	.43430	-.14597	.38818	-.44466 -2	.19053	.95545 -1	-.40088 -1	-.40809 -1
562.FI43S562	.62532	-.25640 -1	.21037	.12457	-.73900 -1	.17737	-.43768	-.29801 -1
565.FI44S565	.58989	.19850	.44017	.81368 -1	.55174	-.14156	.12557	.31460 -1
568.FI45S568	.49519	.30896 -1	.63396	.17266	.15434	-.23409 -1	.24674	.21556 -1
571.FI46S571	.46221	-.79727	.26987	.41733 -1	.59103	.60805 -1	-.47069 -1	-.13216 -1
574.FI47S574	.53727	.21770	.56337	-.29085	.30045	.95528	.24083	.11558
577.FI48S577	.50765	-.46823 -1	.69746 -1	.79229 -1	.82270 -1	.66313 -1	.13458 -1	.82524 -1
580.FI49S580	.56916	.13559 -1	.70950 -1	.63406	.21031	.99607	.20748 -1	.68787 -1
537.FI31S537	.55073	.26206	.19181	.64075	-.12101 -1	-.18543 -1	-.99019 -2	.20652
539.FI31S539	.53687	.23119	-.35283 -1	.44004	.15172	.16990	.51486 -1	.13069
541.FI31S541	.24380	.17572	-.19441 -1	.78138	.97342 -1	.90083 -1	.16065 -1	-.32658 -1
543.F3235543	.69061	.68485	.33656 -1	.34783	.12301	.19763	.84493 -1	.11360
545.F3255545	.47430	.14705	-.46609 -2	.18156	-.77238 -2	.11760 -1	.23119	.52728
547.F3275547	.56692	.17505	.15728	.30108	.10863 -1	.72741 -1	-.26955 -1	.68734
553.F3215553	.34673	.95436 -1	.13431	.25546	.40882 -1	.39902	.16841	.19920
558.FI50S558	.53838	.80755 -1	.15648	.15223	.22414	.62003	-.69849 -1	.50668 -1
561.FI52S561	.74783	.34311	.85224 -1	.17394	.75381	.17455	-.20949 -1	.22927 -1
564.FI51S564	.50491	.41965	.28407	.13386	.38804	-.21590 -1	.14374	-.13166 -2
567.FI53S567	.65424	.19844	.44253		.25769	.12080	.56286	-.57484 -1
SUM SQRS		4.0363	2.6262	2.3546	2.3851	1.4724	1.2980	1.2100
% VARIANCE		14.9	24.7	33.4	42.2	47.7	52.5	57.0
% TOTAL VARIANCE		14.9	9.8	8.7	8.8	5.5	4.8	4.5
% COMMON VARIANCE		26.1	17.2	15.2	15.4	9.6	8.4	7.9

Table C.3 Exploratory Factor Analysis: Wave 2 Variables

Rotation of Factors

ITERATION	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CRITERION	3.4726	10.881	11.693	11.767	11.780	11.783	11.784	11.784	11.784	11.784

PAIRWISE VARIMAX ON 9 FACTORS WITH NORMALIZED LOADINGS

VARIABLE	COMMUNALITY	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
557.FI54S557	.58909	.37017	.25475	.17041 -1	.23047	.14836 -1	.39516 -1	.54106	.23273 -1	.19727 -1
560.FI55S560	.70528	.74533	.16885	.11612	.70663 -1	.15136 -1	.75185 -2	.31074	.63235 -1	.43979 -1
563.FI56S563	.67635	.73901	.24749	.13101 -1	.14553	.17807	.13741	.56704 -1	.68243 -1	.59592 -1
566.FI57S566	.73555	.45435	.26483	.34179 -1	.64828	.11418	.37941 -1	.77361	.63362	.11432
569.FI58S569	.79264	.83959	.13095	.12875	.13947	.11482	.22169 -1	.20027 -1	.10690	.95138 -1
572.FI59S572	.72905	.55452	.13580	.18991 -2	.404~6	.63841	.41067	.97120 -1	.21045	.14887
575.FI60S575	.76229	.38264	.15887	.15848	.718~4	.38784	.49092 -1	.15564	.76966	.12257
578.FI61S578	.67312	.59220	.24427	.28944 -1	.37923	.87690 -2	.14344	.24411	.14581 -1	.10184
537.F31S537	.54507	.21133	.63238	.28031 -1	.10977	.15440	.13773	.61700 -1	.17361	.15234
539.F317S539	.54688	.22551	.62792	.14059	.98548 -1	.12217 -1	.32468 -1	.17963	.17968 -1	.17721
541.F319S541	.34726	.19606	.52334	.81611 -1	.53207 -1	.11776 -1	.38151 -1	.34403 -1	.1275	.99782 -1
543.F32S543	.66599	.38041 -1	.76348	.17986	.13288	.31587 -1	.29384 -1	.12484	.63252 -1	.10574
545.F325S545	.43939	.11604	.37988	.22680 -1	.32233	.31333	.16815 -1	.77278	.40590	.74217 -1
547.F327S547	.74679	.96846	.19325	.19045 -1	.16139	.11583	.16346	.30755	.79533	.44456
549.FOO0S549	.44780	.26571	.47857	.90455 -1	.12359	.92519 -1	.87141 -1	.20025	.11767	.23370
551.FOO0S551	.70815	.96736 -1	.64633	.62813 -1	.20238	.98750 -1	.20510	.27597	.51004	.32885
553.F321S553	.47444	.28288 -1	.43432	.81042 -1	.37128	.13773 -1	.16402	.25974	.44332	.20990
555.FOO0S555	.52543	.58149 -1	.37509	.80085 -1	.47194 -1	.16165	.53843 -1	.35396	.46031	.80709 -1
558.FI50S558	.54248	.50054	.25738	.15935	.10919	.97282 -1	.16127	.61818 -1	.69841	.11801
561.FI52S561	.76186	.31366	.15402	.68533	.19665 -1	.84673 -1	.10043	.36300	.95695	.10725
564.FI51S564	.48545	.34067	.16354	.41138	.17960	.26134	.18033	.14450	.44966	.13209
567.FI53S567	.66794	.14477	.13463	.39502	.49323	.44495	.10083 -1	.22467	.30692	.17323
570.FOO0S570	.79104	.35618	.17279	.73723	.96116 -1	.10345	.11008	.67528 -1	.33960	.23030
573.FOO0S573	.83592	.18188	.12353	.28304	.17381	.10264	.80172	.10444	.96371	.61332 -1
576.FOO0S576	.58349	.92872 -1	.64757 -1	.10963	.57091	.39089	.15240	.90993 -1	.20227	.86652 -1
579.FOO0S579	.55413	.21346	.20250	.26991	.22279	.26911	.38622	.24658	.15940	.19308
559.FI42S559	.42442	.15285	.16875	.20266	.26295	.22475	.27221	.14319	.42288 -1	.33980
562.FI43S562	.62130	.63466 -1	.12308 -1	.68864	.25985 -1	.11706	.15595	.28752	.57580 -1	.13496
565.FI44S565	.55355	.21542	.67290 -1	.56428	.17367 -1	.36978	.12662	.86615 -1	.11796	.15327
568.FI45S568	.58343	.53246 -1	.63907 -1	.21270	.59396	.72576	.16915 -1	.33123 -1	.22812 -1	.13587 -1
571.FI46S571	.60867	.11337	.15548	.69638	.48069 -1	.18455 -1	.17723	.15481 -1	.49371 -1	.12668 -1
574.FI47S574	.81788	.11047	.65092 -1	.25840	.69688 -1	.33134	.78431	.63570 -1	.14604 -1	.25076 -2
577.FI48S577	.60192	.11729 -1	.35189 -1	.89457 -1	.10908	.70309	.19718	.99878	.11036 -1	.10794 -1
580.FI49S580	.62106	.71657 -1	.11839	.23549	.63459	.61668	.36704	.74991	.64898	.13257 -1
SUM SQRS		3.7696	3.4601	3.1859	2.5113	2.3911	2.1737	1.6018	1.2855	.78612
% VARIANCE		11.1	30.6	20.5	62.3	37.7	44.1	48.8	52.6	54.9
% TOTAL VARIANCE		11.1	10.1	9.4	7.4	7.1	6.4	4.7	3.8	2.3
% COMMON VARIANCE		17.8	16.2	15.0	11.9	11.4	10.3	7.5	6.1	3.7

Table C.4 Factor Analyis of HR-Strategy Linkage Variables[1]

Rotation of Factors

Iteration	(1)	(2)
Criterion	.70221	3.0422

PAIRWISE VARIMAX ON 3 FACTORS WITH NORMALIZED LOADINGS

VARIABLE	COMMUNALITY	(1)	(2)	(3)
V541	.27809	.37336	.34717	.13479
V549	.40281	.53071	.28682	.19720
V551	.70592	.78276	.27821	.12569
V553	.49979	.67798	.12963	.15271
V537	.49237	.23087	.61509	.24642
V539	.66497	.18197	.78350	.13413
V543	.61362	.40945	.65063	.15047
V545	.38823	.13902	.32507	.51306
V547	.77121	.14650	.08612	.86212
V555	.37367	.39027	.20216	.42485
	SUM OF SQUARES	1.9406	1.8656	1.3845
	% CUM VARIANCE	19.4	38.0	51.9
	% TOT VARIANCE	19.4	18.6	13.9
	% COM VARIANCE	37.4	38.9	26.8

1 Includes original Wave 1 variables and three variables
  added to the Wave questionnaire.

APPENDIX D

ANALYSIS OF VARIANCE RESULTS: STRATEGIC HUMAN RESOURCE MANAGEMENT AND HUMAN RESOURCE EFFECTIVENESS INDICES

Table D.1 Analysis of Variance: 1982 Structure/Culture

N= 74 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9	4.3503	.48337	.81408	.6051
WITHIN	64	38.001	.59377		
TOTAL	73	42.351			

ETA= .3205
ETA SQR= .1027

RANDOM EFFECTS STATISTICS:
(VAR COMP= -.015178   %VAR AMONG= -0.)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	6	2.1667	.36667	.60553
BU-2	9	2.0556	.84028	.91667
BU-3	12	2.0417	.56629	.75252
BU-4	8	2.3750	.48214	.69437
BU-5	10	2.7000	.45556	.67495
BU-6[2]	0			
BU-7	6	2.0833	.64147	.80104
BU-8	5	2.7000	.32500	.57009
BU-9	11	2.3636	.60455	.77753
BU-10	3	2.5000	1.7500	1.3229
BU-11	4	2.3750	.56250	.75000
GRAND	74	2.3108	.58016	.76168

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1 Only respondents with business unit affiliations are
  included in these analyses. The first number pertains to
  the total number of respondents in 1982 on which the ANOVA
  is based; the second number pertains to the aggregate
  respondents in Wave 1 and Wave 2 with business unit
  affiliations.
2 Acquisition—no Wave 1 data available.

Table D.2 Analysis of Variance: 1982 Planning/Development

N= 74 out of 1972[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9	7.2355	.80395	1.0895	.3830
WITHIN	64	47.224	.73787		
TOTAL	73	54.459			

ETA=.3645
ETA SQR=.1329

RANDOM EFFECTS STATISTICS:
(VAR COMP= .00908   %VAR AMONG= 1.22)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	6	1.7500	.47500	.68920
BU-2	9	1.7778	.69444	.83333
BU-3	12	2.2917	.92992	.96433
BU-4	8	2.5625	.67411	.82104
BU-5	10	2.4500	.58056	.76194
BU-6[2]	0			
BU-7	6	2.0833	1.3417	1.1583
BU-8	5	2.6000	.42500	.65192
BU-9	11	2.6364	.65455	.80904
BU-10	3	2.1667	1.5833	1.2583
BU-11	4	2.5000	.33333	.57735
GRAND	74	2.2973	.74602	.86372

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1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

2 Acquisition--no Wave 1 data available.

Table D.3 Analysis of Variance: 1982 Selection/Assessment

N= 74 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9	6.2380	.69311	1.1327	.3534
WITHIN	64	39.161	.61190		
TOTAL	73	45.399			

ETA= .3707
ETA SQR= .1374

RANDOM EFFECTS STATISTICS:
(VAR COMP= .011165   %VAR AMONG= 1.79)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	6	2.1111	1.0519	1.0256
BU-2	9	2.2222	.66667	.81650
BU-3	12	2.4722	.91835	.95831
BU-4	8	2.9167	.34127	.58414
BU-5	10	2.9333	.24198	.49191
BU-6[2]	0			
BU-7	6	2.3333	.88889	.94281
BU-8	5	2.9333	.07777	.27889
BU-9	11	2.7273	.68485	.82756
BU-10	3	2.5556	.70370	.83887
BU-11	4	2.3333	.29630	.54433
GRAND	74	2.5766	.62191	.78861

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[1] Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

[2] Acquisition—no Wave 1 data available.

Table D.4 Analysis of Variance: 1982 Strategic Level Human Resource Management Effectiveness

N= 77 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9	6.6451	.73834	1.3624	.2229
WITHIN	67	36.310	.54194		
TOTAL	76	42.955			

ETA= .3933
ETA SQR= .1547

RANDOM EFFECTS STATISTICS:
(VAR COMP= .025974   %VAR AMONG= 4.57)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	7	3.1071	.26265	.51249
BU-2	12	2.6071	.31169	.55829
BU-3	12	2.2813	.99751	.99876
BU-4	8	3.1406	.58677	.76601
BU-5	9	2.9861	.53299	.73006
BU-6[2]	0			
BU-7	5	2.3500	.46406	.68122
BU-8	4	2.8125	.27604	.52540
BU-9	11	2.7386	.47017	.68569
BU-10	3	2.6250	1.6875	1.2990
BU-11	6	2.4792	.24010	.49000
GRAND	77	2.7050	.56520	.75180

---

1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

2 Acquisition--no Wave 1 data available.

Table D.5 Analysis of Variance: 1982 Managerial Level Human Resource Management Effectiveness

N= 77 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9	5.6355	.62616	1.8174	.0811
WITHIN	67	23.084	.34453		
TOTAL	76	28.719			

ETA= .4430
ETA SQR= .1962

RANDOM EFFECTS STATISTICS:
(VAR COMP= .03719   %VAR AMONG= 9.74)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	7	3.0000	.20833	.45644
BU-2	12	2.6111	.31103	.55770
BU-3	11	2.8409	.59091	.76871
BU-4	9	3.1667	.20312	.45069
BU-5	10	3.2500	.25000	.50000
BU-6[2]	0			
BU-7	5	2.4000	.33125	.57554
BU-8	4	3.1875	.18229	.42696
BU-9	10	3.0750	.65347	.80838
BU-10	3	3.1667	.27083	.52042
BU-11	6	2.5833	.06667	.25820
GRAND	77	2.9232	.37788	.61472

1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

2 Acquisition--no Wave 1 data available.

Table D.6 Analysis of Variance: 1982 Operational Level Human Resource Management Effectiveness

N= 78 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	9.	7.2185	.80206	3.0521	.0040
WITHIN	68	17.869	.26279		
TOTAL	77	25.088			

ETA= .5364
ETA SQR= .2877

RANDOM EFFECTS STATISTICS:
(VAR COMP= .070366   %VAR AMONG= 21.12)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	7	3.0357	.23810	.48795
BU-2	12	2.7887	.20633	.45424
BU-3	12	2.8363	.43761	.66152
BU-4	9	3.3056	.36372	.60309
BU-5	10	3.1905	.12637	.35549
BU-6[2]	0			
BU-7	5	2.2250	.62031	.78760
BU-8	4	2.7277	.12843	.35844
BU-9	10	3.1375	.15434	.39286
BU-10	3	3.5000	.29688	.54486
BU-11	6	2.5625	.09218	.30362
GRAND	78	2.9447	.32582	.57080

1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

2 Acquisition--no Wave 1 data available.

Table D.7 Analysis of Variance: 1985 Structure/Culture

N= 113 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	5.9492	.59492	1.2378	.2763
WITHIN	102	49.024	.48062		
TOTAL	112	54.973			

ETA= .3290
ETA SQR= .1082

RANDOM EFFECTS STATISTICS:
(VAR COMP= .011571   %VAR AMONG= 2.35)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	2.6875	.39063	.62500
BU-2	7	2.5357	.32143	.56695
BU-3	22	2.4659	.31128	.55793
BU-4	15	3.0944	.18142	.42593
BU-5	13	2.5385	1.0505	1.0249
BU-6	5	2.2500	.40625	.63738
BU-7	8	2.5938	.57031	.75519
BU-8	10	2.7167	.67315	.82046
BU-9	21	2.5952	.49048	.70034
BU-10	5	2.9333	.49097	.70069
BU-11	3	2.1667	.39583	.62915
GRAND	113	2.6283	.49083	.70059

1 Only respondents with business unit affiliations are
included in these analyses. The first number pertains to
the total number of respondents in 1982 on which the ANOVA
is based; the second number pertains to the aggregate
respondents in Wave 1 and Wave 2 with business unit
affiliations.

Table D.8 Analysis of Variance: 1985 Planning/Development

N= 113 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	8.0892	.80892	1.3147	.2326
WITHIN	102	62.758	.61527		
TOTAL	112	70.847			

ETA= .3379
ETA SQR= .1142

RANDOM EFFECTS STATISTICS:
(VAR COMP= .019604   %VAR AMONG= 3.09)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	2.5833	.32407	.56928
BU-2	7	2.6905	.35582	.59651
BU-3	22	2.9318	.53084	.72859
BU-4	15	3.3111	.70582	.84013
BU-5	13	2.6667	1.0000	1.0000
BU-6	5	2.7333	1.0222	1.0111
BU-7	8	2.5417	.44246	.66518
BU-8	10	2.9000	.34691	.58899
BU-9	21	2.8730	.70529	.83982
BU-10	5	3.4667	.42222	.64979
BU-11	3	2.2222	.25926	.50918
GRAND	113	2.8791	.63256	.79534

1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1985 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

Table D.9 Analysis of Variance: 1985 Selection/Assessment

N= 113 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	9.2972	.92972	1.8015	.0695
WITHIN	102	52.641	.51609		
TOTAL	112	61.938			

ETA= .3874
ETA SQR= .1501

RANDOM EFFECTS STATISTICS:
(VAR COMP= .04875   %VAR AMONG= 7.51)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	2.6667	.07407	.27217
BU-2	7	2.4762	.43915	.66269
BU-3	22	2.1667	.42063	.64856
BU-4	15	3.1444	.21772	.46661
BU-5	13	2.6154	.58974	.76795
BU-6	5	2.4667	.14444	.38006
BU-7	8	2.6250	.71230	.84398
BU-8	10	2.6000	.61235	.78253
BU-9	21	2.4286	.77937	.88282
BU-10	5	2.7333	.24444	.49441
BU-11	3	2.4444	1.5926	1.2620
GRAND	113	2.5501	.55302	.74365

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1 Only respondents with business unit affiliations are
   included in these analyses. The first number pertains to
   the total number of respondents in 1985 on which the ANOVA
   is based; the second number pertains to the aggregate
   respondents in Wave 1 and Wave 2 with business unit
   affiliations.

**Table D.10 Analysis of Variance: 1985 Strategic Level
Human Resource Management Effectiveness**

N= 112 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	7.7319	.77319	1.6432	.1051
WITHIN	101	47.524	.47053		
TOTAL	111	55.256			

ETA= .3741
ETA SQR= .1399

RANDOM EFFECTS STATISTICS:
(VAR COMP= .03889   %VAR AMONG= 6.16)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	2.3750	.36458	.60381
BU-2	7	2.4286	.20238	.44987
BU-3	22	2.0000	.18304	.42783
BU-4	14	2.7436	.42227	.64983
BU-5	13	2.1635	.95413	.97679
BU-6	5	1.9750	.12031	.34686
BU-7	8	2.5313	1.0391	1.0193
BU-8	9	2.2222	.44444	.66667
BU-9	21	2.5917	.53896	.73414
BU-10	6	2.3750	.35000	.59161
BU-11	3	2.2500	.29688	.54486
GRAND	112	2.3445	.49780	.70555

1 Only respondents with business unit affiliations are
included in these analyses. The first number pertains to
the total number of respondents in 1985 on which the ANOVA
is based; the second number pertains to the aggregate
respondents in Wave 1 and Wave 2 with business unit
affiliations.

Table D.11 Analysis of Variance: 1985 Managerial Level Human Resource Management Effectiveness

N= 112 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	6.3010	.63010	2.5504	.0087
WITHIN	101	24.953	.24705		
TOTAL	111	31.253			

ETA= .4490
ETA SQR= .2016

RANDOM EFFECTS STATISTICS:
(VAR COMP= .03909   %VAR AMONG= 13.66)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	3.0938	.045573	.21348
BU-2	7	3.1964	.16592	.40734
BU-3	22	2.8320	.19803	.44500
BU-4	14	3.2232	.12783	.35754
BU-5	13	2.8942	.29387	.54210
BU-6	5	2.3250	.10625	.32596
BU-7	8	2.8906	.43945	.66291
BU-8	9	3.0278	.40538	.63670
BU-9	21	2.9167	.32708	.57191
BU-10	6	3.2917	.12917	.35940
BU-11	3	2.2083	.27083	.52042
GRAND	112	2.9413	.28156	.53062

1 Only respondents with business unit affiliations are included in these analyses. The first number pertains to the total number of respondents in 1982 on which the ANOVA is based; the second number pertains to the aggregate respondents in Wave 1 and Wave 2 with business unit affiliations.

Table D.12 Analysis of Variance: 1985 Operational Level Human Resource Effectiveness

N= 112 out of 197[1]

SOURCE	DF	SUM OF SQRS	MEAN SQR	F-STAT	SIGNIF
BETWEEN	10	4.8173	.48173	1.4675	.1626
WITHIN	101	33.155	.32827		
TOTAL	111	37.973			

ETA= .3562
ETA SQR= .1269

RANDOM EFFECTS STATISTICS:
(VAR COMP= .01566   %VAR AMONG= 4.55)

BUSUNIT	N	MEAN	VARIANCE	STD DEV
BU-1	4	3.4375	.22396	.47324
BU-2	7	3.1786	.19196	.43814
BU-3	22	3.3125	.21243	.46090
BU-4	14	3.4286	.16518	.40642
BU-5	13	3.5385	.39163	.62580
BU-6	5	2.8750	.19531	.44194
BU-7	8	3.3750	.74107	.86086
BU-8	9	3.5694	.28559	.53441
BU-9	21	3.2202	.40766	.63849
BU-10	6	3.5208	.53385	.73065
BU-11	3	2.5417	.47396	.68845
GRAND	112	3.3281	.34210	.58489

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[1] Only respondents with business unit affiliations are
included in these analyses. The first number pertains to
the total number of respondents in 1985 on which the ANOVA
is based; the second number pertains to the aggregate
respondents in Wave 1 and Wave 2 with business unit
affiliations.

APPENDIX E

CORRELATIONS BETWEEN THE FINANCIAL PERFORMANCE AND PRODUCTIVITY MEASURES AND THE STRATEGIC HRM AND HR EFFECTIVENESS INDICES (TOTAL SAMPLE)

Table E.1 Correlation of 1982-1985 Revenue Growth with Strategic HRM and HR Effectiveness Indices (total sample)

1982 Variable[1]		1982	1983	1984	1985
Structure/	r[2]	.0700	-.0950	.1805	-.1320
Culture	p[3]	.8477	.7941	.6178	.7162
Planning/	r	-.4391	.3140	-.1078	-.5343
Development	p	.2042	.3770	.7669	.1116
Selection/	r	-.1700	-.2388	.2605	-.1427
Assessment	p	.6388	.5064	.4673	.6941
Strategic HR	r	.2931	-.2924	.5652	.5829
Effectiveness	p	.4111	.4123	.0887	.0769
Managerial HR	r	.4614	-.4125	.7213	-.3883
Effectiveness	p	.1795	.2361	.0185*	.2675
Operational HR	r	.4986	-.3514	.6672	.6649
Effectiveness	p	.1424	.3194	.0351*	.0359*

1985 Index[4]		1982	1983	1984	1985
Structure/	r	.4483	-.6978	.2877	.6125
Culture	p	.1667	.0170*	.3909	.0451*
Planning/	r	.4153	-.5858	.3721	-.4778
Development	p	.2040	.0582	.2597	.1371
Selection/	r	.0625	-.3365	.0605	.4968
Assessment	p	.8552	.3115	.8597	.1200
Strategic HR	r	-.0551	-.2251	-.2566	.3704
Effectiveness	p	.8721	.5057	.4462	.2621
Managerial HR	r	.6221	-.8552	.3563	.6765
Effectiveness	p	.0410*	.0008***	.2822	.0223*
Operational HR	r	.5179	-.9213	.5423	.5072
Effectiveness	p	.1027	.0001***	.0848	.1112

1 N=10 for all 1982 correlations in Appendix E.
2 r=correlation of financial performance measure with the strategic HRM and HR effectiveness indices
3 p=probability   *=p<.05   **=p<.01   ***=p<.001
4 N=11 for all 1985 correlations in Appendix E.

Table E.2   Correlation of 1982-1985 Operating Profit Rate with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.2840	.3898	.5053	.4244
Culture	p^2	.4266	.2655	.1363	.2216
Planning/	r	.6126	.7213	.8655	.5958
Development	p	.0597	.0186*	.0012**	.0691
Selection/	r	.6119	.7353	.7079	.5277
Assessment	p	.0601	.0154*	.0220*	.1169
Strategic HR	r	-.3589	-.2703	-.1088	.1327
Effectiveness	p	.3085	.4501	.7648	.7149
Managerial HR	r	.0221	.1722	.3060	.4491
Effectiveness	p	.9517	.6342	.3898	.1929
Operational HR	r	-.0515	.0253	.0477	.1495
Effectiveness	p	.8877	.9447	.8958	.6802
1985 Index					
Structure/	r	-.0130	.0666	.0384	.1565
Culture	p	.9696	.8458	.9108	.6458
Planning/	r	.2625	.3209	.2013	.2033
Development	p	.4354	.3360	.5529	.5487
Selection/	r	-.0814	-.0466	.0568	.1277
Assessment	p	.8119	.8918	.8683	.7083
Strategic HR	r	-.0087	-.0158	-.1010	-.1470
Effectiveness	p	.9798	.9632	.7676	.6662
Managerial HR	r	-.0671	-.0256	-.2880	-.1653
Effectiveness	p	.8445	.9404	.3904	.6271
Operational HR	r	-.0209	.0997	.0550	.2711
Effectiveness	p	.9513	.7705	.8725	.4201

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1 r=correlation of financial performance measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.3   Correlation of 1982-1985 Return on Investment
            with Strategic HRM and HR Effectiveness Indices
            (total sample)

1982 Index		1982	1983	1984	1985
Structure/	r^1	.4979	.5259	-.2748	-.2752
Culture	p^2	.1431	.1185	.4423	.4415
Planning/	r	.5956	.4139	-.1424	-.1605
Development	p	.0693	.2344	.6948	.6578
Selection/	r	.7922	.6361	-.1615	-.1626
Assessment	p	.0063**	.0480*	.6559	.6536
Strategic HR	r	.1374	.2936	-.3864	-.3690
Effectiveness	p	.7051	.4103	.2700	.2940
Managerial HR	r	.3006	.4193	-.5881	-.5450
Effectiveness	p	.3987	.2277	.0936	.1033
Operational HR	r	.0085	.2429	-.6214	-.6094
Effectiveness	p	.9813	.4989	.0551	.0614
1985 Index					
Structure/	r	.2889	.0834	-.0090	.0018
Culture	p	.3888	.8075	.9790	.9958
Planning/	r	.1664	.0082	-.2646	-.2578
Development	p	.6248	.9809	.4317	.4441
Selection/	r	.2456	.1214	.0755	.0834
Assessment	p	.4667	.7221	.8255	.8075
Strategic HR	r	.2491	-.0079	.2589	.2541
Effectiveness	p	.4602	.9815	.4420	.4508
Managerial HR	r	.2228	.0863	-.0192	-.0036
Effectiveness	p	.5102	.8007	.9554	.9916
Operational HR	r	.4777	.3795	.1414	.1625
Effectiveness	p	.1373	.2497	.6784	.6330

1 r=correlation of financial performance measure with the
  strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.4 Correlation of 1982-1985 Average Investment Rate with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	-.5353	-.4088	-.3305	-.1903
Culture	p^2	.1108	.2408	.3509	.5985
Planning/	r	-.7000	-.7341	-.6248	-.4734
Development	p	.0242*	.0156*	.0535	.1670
Selection/	r	-.7051	-.6461	-.4807	-.3735
Assessment	p	.0228*	.0436*	.1596	.2877
Strategic HR	r	.1110	.1655	.2280	.0548
Effectiveness	p	.7602	.6477	.5264	.8806
Managerial HR	r	-.1717	-.1527	-.0312	-.0117
Effectiveness	p	.6352	.6736	.9318	.9744
Operational HR	r	.0200	-.0414	.0503	.0363
Effectiveness	p	.9562	.9097	.8903	.9206
1985 Index					
Structure/	r	-.3839	-.2090	-.0793	-.1343
Culture	p	.2438	.5375	.8167	.6938
Planning/	r	-.2347	-.2069	-.0900	.0008
Development	p	.4872	.5415	.7924	.9981
Selection/	r	-.2918	-.1764	-.1444	-.2374
Assessment	p	.3839	.6040	.6718	.4821
Strategic HR	r	-.4246	-.2705	-.1747	-.2984
Effectiveness	p	.1931	.4212	.6075	.3728
Managerial HR	r	-.2546	-.0053	.1650	.0872
Effectiveness	p	.4500	.9877	.6279	.7989
Operational HR	r	-.3752	-.1972	-.0737	-.1442
Effectiveness	p	.2555	.5610	.8294	.6724

1 r=correlation of financial performance measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.5 Correlation of 1982-1985 Sales to Pay with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.5000	.3671	.3913	.2446
Culture	p^2	.1411	.2967	.2635	.4958
Planning/	r	.4154	.4826	.4360	.2221
Development	p	.2326	.1578	.2078	.5374
Selection/	r	.4174	.2479	.2416	.0801
Assessment	p	.2300	.4899	.5012	.8258
Strategic HR	r	.1730	.0246	.0528	.2381
Effectiveness	p	.6327	.9461	.8849	.5076
Managerial HR	r	.2146	-.0095	.0340	.0480
Effectiveness	p	.5516	.9793	.9257	.8952
Operational HR	r	.0767	-.0991	-.0864	.0594
Effectiveness	p	.8333	.7853	.8125	.8706
1985 Index					
Structure/	r	-.3275	-.4945	-.5637	-.5107
Culture	p	.3256	.1221	.0709	.1804
Planning/	r	-.3593	-.5407	-.5663	-.5658
Development	p	.2779	.0859	.0693	.0697
Selection/	r	-.1574	-.2390	-.2633	-.1694
Assessment	p	.6440	.4790	.4340	.6184
Strategic HR	r	-.1280	-.1033	-.2980	-.1718
Effectiveness	p	.7077	.7624	.3734	.6135
Managerial HR	r	-.2651	-.4895	-.5746	-.4881
Effectiveness	p	.4308	.1265	.0644	.1277
Operational HR	r	-.0644	-.3908	-.3948	-.4129
Effectiveness	p	.8507	.2347	.2295	.2069

1 r=correlation of productivity measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.6   Correlation of 1982-1985 Sales per Employee with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.4809	.4204	.4422	.2309
Culture	p^2	.1594	.2264	.2006	.5209
Planning/	r	.3567	.4215	.3328	-.0315
Development	p	.3116	.2251	.3474	.9311
Selection/	r	.4922	.3799	.3321	-.0057
Assessment	p	.1485	.2789	.3485	.9875
Strategic HR	r	.2129	.1087	.1732	.3064
Effectiveness	p	.5549	.7649	.6323	.3892
Managerial HR	r	.3729	.1930	.2294	.1078
Effectiveness	p	.2885	.5932	.5239	.7668
Operational HR	r	.2758	.0877	.0855	.1356
Effectiveness	p	.4404	.8096	.8144	.7088
1985 Index					
Structure/	r	-.0122	-.3172	-.3821	-.3719
Culture	p	.9717	.3418	.2462	.2601
Planning/	r	-.0625	-.3394	-.4035	-.5063
Development	p	.8552	.3071	.2184	.1121
Selection/	r	-.0690	-.2238	-.2308	-.1470
Assessment	p	.8403	.5082	.4947	.6662
Strategic HR	r	.0690	-.0877	-.2628	-.1444
Effectiveness	p	.8403	.7976	.4350	.6718
Managerial HR	r	.0984	-.2396	-.3130	-.2189
Effectiveness	p	.7734	.4780	.3487	.5178
Operational HR	r	.2747	-.0555	-.0466	-.1425
Effectiveness	p	.4137	.8713	.8917	.6760

1 r=correlation of productivity measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.7 Correlation of 1982-1985 Value-Added Sales per Employee with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.2284	.1931	.3222	.2242
Culture	p^2	.5257	.5931	.3638	.5335
Planning/	r	.0985	.3666	.3625	.0397
Development	p	.7866	.2975	.3032	.9134
Selection/	r	.3496	.5295	.5768	.3344
Assessment	p	.3221	.1155	.0809	.3449
Strategic HR	r	.2451	.0893	.1653	.5251
Effectiveness	p	.4949	.8062	.6482	.1191
Managerial HR	r	.1924	.2100	.3348	.4488
Effectiveness	p	.5945	.5603	.3443	.1932
Operational HR	r	.0512	.0177	.0518	.1948
Effectiveness	p	.8883	.9613	.8871	.5898
1985 Index					
Structure/	r	-.1230	-.0329	-.0557	.1963
Culture	p	.7185	.9235	.8707	.5630
Planning/	r	-.2062	-.0253	-.0484	-.0443
Development	p	.5430	.9411	.8876	.8979
Selection/	r	-.1051	-.1762	-.1446	.1161
Assessment	p	.7585	.6042	.6713	.7340
Strategic HR	r	-.0164	.0701	-.1572	.0370
Effectiveness	p	.9618	.8378	.6443	.9141
Managerial HR	r	.0672	.1108	.0218	.2627
Effectiveness	p	.8443	.7458	.9494	.4351
Operational HR	r	.2667	.2802	.3876	.5927
Effectiveness	p	.4279	.4040	.2388	.0547

1 r=correlation of productivity measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.8 Correlation of 1982-1985 Gross Inventory Rate with Strategic HRM and HR Effectiveness Indices (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	-.3264	-.4841	-.4111	-.2018
Culture	p^2	.3573	.1563	.2379	.5761
Planning/	r	-.3342	-.6379	-.5915	-.2743
Development	p	.3453	.0472*	.0717	.4431
Selection/	r	-.6746	-.7667	-.6631	-.4316
Assessment	p	.0324*	.0097**	.0366*	.2129
Strategic HR	r	-.2024	-.1414	-.0091	-.0331
Effectiveness	p	.5750	.6969	.9800	.9276
Managerial HR	r	-.5975	-.5887	-.4968	-.4971
Effectiveness	p	.0681	.0734	.1441	.1438
Operational HR	r	-.5078	-.4720	-.3918	-.5445
Effectiveness	p	.1341	.1684	.2628	.1037
1985 Index					
Structure/	r	-.6605	-.5114	-.4482	-.4987
Culture	p	.0269*	.1078	.1668	.1184
Planning/	r	-.8396	-.7279	-.7196	-.8056
Development	p	.0012**	.0111*	.0125*	.0028**
Selection/	r	-.3835	-.3859	-.3137	-.2930
Assessment	p	.2444	.2411	.3476	.3819
Strategic HR	r	-.1807	-.1187	-.0346	.0056
Effectiveness	p	.5949	.7280	.9196	.9870
Managerial HR	r	-.5072	-.1894	-.1136	-.2381
Effectiveness	p	.1113	.5771	.7394	.4809
Operational HR	r	-.6720	-.4174	-.3298	-.3868
Effectiveness	p	.0235*	.2015	.3219	.2400

1 r=correlation of productivity measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

Table E.9 Correlation of 1982-1985 Scrap/Rework Rate with
          Strategic HRM and HR Effectiveness Indices
          (total sample)

		1982	1983	1984	1985
1982 Index					
Structure/	r[1]	-.3213	-.5247	-.4789	-.6190
Culture	p[2]	.3653	.1194	.1614	.0564
Planning/	r	-.1322	-.2450	-.0798	-.1432
Development	p	.7158	.4951	.8265	.6931
Selection/	r	-.4703	-.5801	-.5297	-.4711
Assessment	p	.1701	.0787	.1153	.1694
Strategic HR	r	-.1074	-.0543	-.2499	-.4519
Effectiveness	p	.7679	.8815	.4862	.1898
Managerial HR	r	-.1538	-.3361	-.4169	-.4654
Effectiveness	p	.6715	.3423	.2307	.1753
Operational HR	r	-.1140	-.2723	-.3092	-.3087
Effectiveness	p	.7538	.4466	.3847	.3855
1985 Index					
Structure/	r	-.3787	-.2687	-.4217	-.3993
Culture	p	.2507	.4244	.1964	.2238
Planning/	r	-.4434	-.5006	-.5374	-.3839
Development	p	.1719	.1168	.0883	.2438
Selection/	r	-.4427	-.3150	-.4681	-.6378
Assessment	p	.1727	.3455	.1465	.0348*
Strategic HR	r	-.2775	.0117	-.0206	-.0494
Effectiveness	p	.4087	.9727	.9521	.8852
Managerial HR	r	-.3211	-.1658	-.3072	-.1402
Effectiveness	p	.3357	.6262	.3581	.6810
Operational HR	r	-.2986	-.2744	-.4690	-.3526
Effectiveness	p	.3724	.4142	.1456	.2876

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1 r=correlation of productivity measure with the strategic
  HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01

APPENDIX F

CORRELATIONS BETWEEN THE FINANCIAL PERFORMANCE AND PRODUCTIVITY MEASURES AND THE STRATEGIC HRM AND HR EFFECTIVENESS INDICES (OUTLIER EXCLUDED)

Table F.1 Correlation of 1982-1985 Revenue Growth with
          Strategic HRM and HR Effectiveness Indices
          (outlier excluded)

		1982	1983	1984	1985
1982 Index[1]					
Structure/	r^2	-.1465	-.1514	.0060	-.2141
Culture	p^3	.7069	.6973	.9878	.5801
Planning/	r	-.6592	.2962	-.2489	-.5958
Development	p	.0534	.4390	.5185	.0905
Selection/	r	-.3639	-.2817	.1630	-.1974
Assessment	p	.3357	.4628	.6751	.6107
Strategic HR	r	.0936	-.3849	.4528	.5685
Effectiveness	p	.8107	.3063	.2210	.1102
Managerial HR	r	.2089	-.6274	.6107	.3577
Effectiveness	p	.5897	.0705	.0807	.3446
Operational HR	r	.2437	-.5794	.5254	.7357
Effectiveness	p	.5275	.1020	.1463	.0238*
1985 Index[4]					
Structure/	r	.3923	-.6986	.3995	.6590
Culture	p	.2963	.0363*	.2867	.0535
Planning/	r	.3359	-.6472	.3018	.4516
Development	p	.3768	.0595	.4300	.2224
Selection/	r	.0463	-.3109	.1179	.5137
Assessment	p	.9058	.4155	.7625	.1572
Strategic HR	r	-.1502	-.1090	-.1259	.4702
Effectiveness	p	.6996	.7802	.7468	.2015
Managerial HR	r	.6150	-.9199	.5332	.7791
Effectiveness	p	.0779	.0004***	.1393	.0133*
Operational HR	r	.5686	-.9369	.7918	.5611
Effectiveness	p	.1101	.0002***	.0110*	.1160

1 N=10 for all 1982 correlations in Appendix F.
2 r=correlation of financial performance measure with the
  strategic HRM and HR effectiveness indices
3 p=probability *=p<.05 **=p<.01 ***=p<.001
4 N=11 for all 1985 correlations in Appendix F.

**Table F.2   Correlation of 1982-1985 Operating Profit Rate
with Strategic HRM and HR Effectiveness Indices
(outlier excluded)**

		1982	1983	1984	1985
1982 Index					
Structure/	r[1]	.3355	.4307	.5862	.5026
Culture	p[2]	.3775	.2471	.0971	.1679
Planning/	r	.6461	.7459	.9147	.6394
Development	p	.0601	.0210*	.0005***	.0637
Selection/	r	.6546	.7688	.7638	.5792
Assessment	p	.0557	.0155*	.0166*	.1022
Strategic HR	r	-.3604	-.2827	-.0698	.2022
Effectiveness	p	.3407	.4611	.8583	.6019
Managerial HR	r	.0901	.2452	.4759	.6654
Effectiveness	p	.8178	.5248	.1954	.0505*
Operational HR	r	.0004	.0629	.1581	.3008
Effectiveness	p	.9992	.8723	.6845	.4315
1985 Index					
Structure/	r	-.0104	.0431	.0455	.2021
Culture	p	.9788	.9122	.9074	.6020
Planning/	r	.2957	.3388	.2400	.2486
Development	p	.4399	.3725	.5339	.5189
Selection/	r	-.0867	-.0596	.0515	.1314
Assessment	p	.8245	.8789	.8953	.7362
Strategic HR	r	-.0321	-.0684	-.1546	-.1830
Effectiveness	p	.9348	.8612	.6913	.6375
Managerial HR	r	-.0749	-.0730	-.3433	-.1625
Effectiveness	p	.8481	.8519	.3657	.6761
Operational HR	r	-.0292	.0763	.0499	.3131
Effectiveness	p	.9406	.8454	.8985	.4121

1 r=correlation of financial performance measure with the
  strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.3 Correlation of 1982-1985 Return on Investment
with Strategic HRM and HR Effectiveness Indices
(outlier excluded)

1982 Index		1982	1983	1984	1985
Structure/	r^1	.6637	.5647	.5862	.5474
Culture	p^2	.0513	.1132	.0971	.1272
Planning/	r	.6956	.4244	.4766	.3278
Development	p	.0375*	.2549	.1946	.3891
Selection/	r	.9247	.6581	.6155	.5716
Assessment	p	.0004***	.0540	.0777	.1079
Strategic HR	r	.2909	.3259	.2476	.3548
Effectiveness	p	.4476	.3921	.5207	.3488
Managerial HR	r	.6193	.5351	.4468	.5231
Effectiveness	p	.0753	.1376	.2280	.1484
Operational HR	r	.2588	.3248	.2446	.3268
Effectiveness	p	.5013	.3938	.5258	.3906
1985 Index					
Structure/	r	.2069	-.0053	-.1219	-.0194
Culture	p	.5932	.9891	.7546	.9605
Planning/	r	.2419	-.0062	-.1032	-.0495
Development	p	.5306	.9873	.7916	.8994
Selection/	r	.2063	.0931	.0634	.1178
Assessment	p	.5943	.8117	.8713	.7627
Strategic HR	r	.0521	-.1336	-.2171	-.2203
Effectiveness	p	.8941	.7318	.5747	.5689
Managerial HR	r	.0964	-.0308	-.2124	-.0554
Effectiveness	p	.8051	.9372	.5833	.8874
Operational HR	r	.4017	.3313	.1770	.3369
Effectiveness	p	.2839	.3839	.6487	.3753

1 r=correlation of financial performance measure with the
  strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.4 Correlation of 1982-1985 Average Investment Rate with Strategic HRM and HR Effectiveness Indices (outlier excluded)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	-.7794	-.5922	-.5800	-.4546
Culture	p^2	.0133*	.0930	.1016	.2190
Planning/	r	-.8653	-.8667	-.8164	-.6826
Development	p	.0026**	.0025**	.0073**	.0427*
Selection/	r	-.8956	-.7923	-.6780	-.5929
Assessment	p	.0011**	.0109**	.0447*	.0924
Strategic HR	r	-.0611	.0346	.0526	-.1981
Effectiveness	p	.8760	.9296	.8930	.6094
Managerial HR	r	-.5596	-.4693	-.4238	-.4647
Effectiveness	p	.1172	.2025	.2556	.2075
Operational HR	r	-.3306	-.3515	-.3475	-.4413
Effectiveness	p	.3849	.3536	.3594	.2344
1985 Index					
Structure/	r	-.2172	-.0892	-.0139	-.0568
Culture	p	.5745	.8195	.9718	.8846
Planning/	r	-.3797	-.3055	-.2221	-.1322
Development	p	.3135	.4241	.5658	.7346
Selection/	r	-.2531	-.1233	-.1062	-.2103
Assessment	p	.5111	.7519	.7856	.5870
Strategic HR	r	-.1039	-.0376	.0330	-.0830
Effectiveness	p	.7902	.9234	.9328	.8319
Managerial HR	r	.0720	.2279	.3411	.2893
Effectiveness	p	.8540	.5554	.3690	.4502
Operational HR	r	-.1615	-.0366	.0517	-.0011
Effectiveness	p	.6780	.9255	.8948	.9977

1 r=correlation of financial performance measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.5   Correlation of 1982-1985 Sales to Pay with Strategic HRM and HR Effectiveness Indices (outlier excluded)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.4881	.3303	.3469	.1616
Culture	p^2	.1825	.3854	.3603	.6779
Planning/	r	.3994	.4625	.4100	.1737
Development	p	.2870	.2100	.2731	.6549
Selection/	r	.3999	.2134	.2001	.0111
Assessment	p	.2863	.5814	.6056	.9774
Strategic HR	r	.1290	-.0569	-.0398	.1381
Effectiveness	p	.7409	.8844	.9190	.7230
Managerial HR	r	.1682	-.1535	-.1220	-.1631
Effectiveness	p	.6652	.6934	.7546	.6749
Operational HR	r	-.0160	-.2901	-.3012	-.1697
Effectiveness	p	.9675	.4488	.4309	.6625
1985 Index					
Structure/	r	-.4241	-.6568	-.6671	-.5890
Culture	p	.2552	.0546	.0497*	.0952
Planning/	r	-.4241	-.6421	-.6633	-.6900
Development	p	.2552	.0622	.0515	.0397*
Selection/	r	-.1706	-.2671	-.2675	-.1591
Assessment	p	.6608	.4873	.4865	.6827
Strategic HR	r	-.1766	-.1778	-.3246	-.1133
Effectiveness	p	.6494	.6471	.3941	.7716
Managerial HR	r	-.3982	-.7294	-.7415	-.6076
Effectiveness	p	.2885	.0257*	.0222*	.0826
Operational HR	r	-.1084	-.5099	-.4452	-.4369
Effectiveness	p	.7813	.1608	.2298	.2397

1 r=correlation of productivity measure with the strategic
   HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.6 Correlation of 1982-1985 Sales per Employee with Strategic HRM and HR Effectiveness Indices (outlier excluded)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.4816	.4044	.4222	.1575
Culture	p^2	.1893	.2804	.2576	.6856
Planning/	r	.3464	.4068	.3122	-.0886
Development	p	.3611	.2772	.4133	.8206
Selection/	r	.4865	.3622	.3086	-.0720
Assessment	p	.1842	.3381	.4192	.8539
Strategic HR	r	.1926	.0606	.1244	.2300
Effectiveness	p	.6197	.8770	.7499	.5517
Managerial HR	r	.4027	.1459	.1790	-.0578
Effectiveness	p	.2825	.7081	.6448	.8826
Operational HR	r	.2861	.0049	-.0135	-.0357
Effectiveness	p	.4554	.9901	.9726	.9274
1985 Index					
Structure/	r	-.1604	-.4531	-.4664	-.4899
Culture	p	.6802	.2206	.2057	.1807
Planning/	r	-.1161	-.4107	-.4701	-.6236
Development	p	.7661	.2772	.2017	.0727
Selection/	r	-.1143	-.2536	-.2389	-.1576
Assessment	p	.7696	.5103	.5358	.6856
Strategic HR	r	-.0622	-.1769	-.3125	-.1685
Effectiveness	p	.8736	.6488	.4129	.6647
Managerial HR	r	-.0767	-.4206	-.4303	-.3571
Effectiveness	p	.8446	.2596	.2476	.3455
Operational HR	r	.1881	-.1357	-.0690	-.1908
Effectiveness	p	.6280	.7278	.8599	.6230

1 r=correlation of productivity measure with the strategic
  HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.7 Correlation of 1982-1985 Value-Added Sales per Employee with Strategic HRM and HR Effectiveness Indices (outlier excluded)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	.2753	.2227	.3823	.2649
Culture	p^2	.4734	.5646	.3099	.4910
Planning/	r	.1181	.3844	.3928	.0544
Development	p	.7623	.3070	.2957	.8894
Selection/	r	.3824	.5581	.6225	.3625
Assessment	p	.3097	.1184	.0734	.3376
Strategic HR	r	.3079	.1179	.2267	.6105
Effectiveness	p	.4202	.7626	.5575	.0808
Managerial HR	r	.3059	.2989	.4994	.6203
Effectiveness	p	.4234	.4346	.1710	.0747
Operational HR	r	.1357	.0592	.1494	.3133
Effectiveness	p	.7277	.8798	.7012	.4118
1985 Index					
Structure/	r	-.1261	-.0762	-.0504	.1650
Culture	p	.7466	.8456	.8976	.6714
Planning/	r	-.1926	-.0218	-.0239	-.0384
Development	p	.6196	.9556	.9513	.9219
Selection/	r	-.1084	-.1949	-.1495	.0967
Assessment	p	.7813	.6154	.7010	.8045
Strategic HR	r	-.0324	.0216	-.2051	-.0444
Effectiveness	p	.9340	.9561	.5966	.9097
Managerial HR	r	.0961	.0795	.0425	.2428
Effectiveness	p	.8058	.8388	.9135	.5291
Operational HR	r	.2963	.2676	.4297	.5997
Effectiveness	p	.4388	.4863	.2484	.0878

1 r=correlation of productivity measure with the strategic
  HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.8   Correlation of 1982-1985 Gross Inventory Rate
             with Strategic HRM and HR Effectiveness Indices
             (outlier excluded)

1982 Index		1982	1983	1984	1985
Structure/	r^1	-.3749	-.5337	-.4720	-.2285
Culture	p^2	.3202	.1389	.1995	.5543
Planning/	r	-.3566	-.6617	-.6244	-.2878
Development	p	.3462	.0522	.0722	.4527
Selection/	r	-.7149	-.8026	-.7076	-.4544
Assessment	p	.0304*	.0092**	.0330*	.2192
Strategic HR	r	-.2538	-.1743	-.0471	-.0515
Effectiveness	p	.5100	.6538	.9042	.8953
Managerial HR	r	-.8099	-.7780	-.6944	-.6561
Effectiveness	p	.0081**	.0136*	.0379*	.0550
Operational HR	r	-.7290	-.6589	-.5889	-.7488
Effectiveness	p	.0259*	.0536	.0952	.0203*
1985 Index					
Structure/	r	-.7878	-.6246	-.6018	-.7018
Culture	p	.0117*	.0721	.0864	.0351*
Planning/	r	-.9039	-.7806	-.7997	-.8960
Development	p	.0008***	.0130*	.0097**	.0011**
Selection/	r	-.4028	-.4081	-.3494	-.3467
Assessment	p	.2824	.2756	.3567	.3607
Strategic HR	r	-.2559	-.1945	-.1307	-.1403
Effectiveness	p	.5064	.6160	.7375	.7188
Managerial HR	r	-.6795	-.3010	-.2675	-.4711
Effectiveness	p	.0441*	.4313	.4865	.2005
Operational HR	r	-.7868	-.5103	-.4524	-.5623
Effectiveness	p	.0119*	.1604	.2214	.1151

1 r=correlation of productivity measure with the strategic
  HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

Table F.9   Correlation of 1982-1985 Scrap/Rework Rate with Strategic HRM and HR Effectiveness Indices (outlier excluded)

		1982	1983	1984	1985
1982 Index					
Structure/	r^1	-.4698	-.6438	-.6222	-.7648
Culture	p^2	.2020	.0613	.0736	.0164*
Planning/	r	-.2040	-.2959	-.1374	-.1986
Development	p	.5985	.4395	.7245	.6085
Selection/	r	-.5812	-.6583	-.6269	-.5563
Assessment	p	.1007	.0539	.0708	.1198
Strategic HR	r	-.2592	-.1488	-.3987	-.6154
Effectiveness	p	.5006	.7025	.2878	.0777
Managerial HR	r	-.4303	-.5807	-.7363	-.7794
Effectiveness	p	.2477	.1011	.0237*	.0133*
Operational HR	r	-.4092	-.5296	-.6340	-.6121
Effectiveness	p	.2741	.1426	.0667	.0798
1985 Index					
Structure/	r	-.5936	-.5549	-.7399	-.7002
Culture	p	.0920	.1209	.0227*	.0357*
Planning/	r	-.5953	-.6638	-.7229	-.5341
Development	p	.0908	.0512	.0278*	.1386
Selection/	r	-.5084	-.4143	-.5829	-.7672
Assessment	p	.1622	.2676	.0995	.0158*
Strategic HR	r	-.4315	-.1958	-.2124	-.2483
Effectiveness	p	.2461	.6136	.5833	.5194
Managerial HR	r	-.6079	-.5267	-.7088	-.4737
Effectiveness	p	.0824	.1451	.0325*	.1977
Operational HR	r	-.4546	-.5288	-.7569	-.6053
Effectiveness	p	.2189	.1433	.0182*	.0841

1 r=correlation of productivity measure with the strategic HRM and HR effectiveness indices
2 p=probability   *=p<.05   **=p<.01   ***=p<.001

APPENDIX G

CROSS-SECTIONAL AND LAGGED REGRESSION ANALYSES: THE FINANCIAL PERFORMANCE AND PRODUCTIVITY MEASURES AND THE STRATEGIC HRM AND HR EFFECTIVENESS INDICES

Table G.1 Cross-Sectional Effects of the 1982 and 1985 HRM
Indices on 1982 and 1985 Financial Performance

	PERGR		OPPLAN		ROI		INVRAT	
	1982	1985	1982	1985	1982	1985	1982	1985
STRCUL	-.052	-.003	-.026	.128	-.082	-.036	-.015	-.027
PLADEV	-.203	.015	.218	.104	.005	-.209*	-.135	.079
SELASS	-.067	.138	.205	-.065	.286	.090	-.173	-.043
STREFF	.118	-.104	-.211	.106	.033	.279*	.110	-.360***
MGREFF	.102	.363**	-.041	-.454***	.092	-.273	-.068	.436***
OPEFF	.227	-.145	-.110	.347***	-.026	.222	.061	-.316**
MULT R	.310	.313	.351	.299	.285	.259	.285	.280
R-SQUARED	.096	.090	.123	.089	.081	.067	.081	.083
N	66	111	66	111	66	111	66	111

P < ****.001 ***.01 **.05 *.10

Table G.2 Cross-Sectional Effects of the 1982 and 1985 HRM
Indices on 1982 and 1985 Producivity

	STOPAY		SALEMP		VADSAL		GINVNT		SCRAP	
	1982	1985	1982	1985	1982	1985	1982	1985	1982	1985
STRCUL	.038	-.088	-.017	-.099	-.078	-.020	.175	-.154	.020	-.001
PLADEV	.015	-.174	-.031	-.189*	-.164	-.130	.035	-.313***	.194	.119
SELASS	.086	.086	.127	.076	.193	.026	-.269	.110	-.210	.386***
STREFF	.069	.251*	.103	.172	.213	.201	-.006	.165	-.160	-.023
MGREFF	.044	-.302*	.067	-.177	.032	-.259	-.151	.023	.014	.125
OPEFF	.074	.146	.152	.140	.066	.335**	-.188	-.046	.079	-.133
MULT R	.230	.259	.292	.223	.260	.256	.365	.319	.217	.351
R-SQUARED	.053	.067	.085	.050	.068	.066	.134	.102	.047	.123
N	66	111	66	111	66	111	66	111	66	111

P < ****.001 ***.01 **.05 *.10

Table G.3 Cross-Sectional and Lagged Effects of the 1982
HRM Indices on 1982-1985 Revenue Growth[1]

	1982	1983	1984	1985
STRCUL	-.052	.191	-.177	-.090
PLADEV	-.203	.413***	-.186	-.428***
SELASS	-.067	-.260	.130	.019
STREFF	.118	-.265**	.161	.371***
MGREFF	.102	-.104	.177	.042
OPEFF	.227	-.137	.371***	.347***
MULT R	.310	.394	.478	.552
R-SQUARED	.096	.155	.228	.304
N	66	66	66	66

P < ****.001 ***.01 **.05 *.10

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1 Only respondents with business unit affiliations were
included in these and the subsequent regression analyses
(Wave 1 N=66; Wave 2 N=111) as they could properly be
matched to the financial performance data. Respondents
excluded from these analyses mostly occupy Corporate or
Group staff positions.

Table G.4   Cross-Sectional and Lagged Effects of the 1982
            HRM Indices on 1982-1985 Operating Profit Rate[1]

	1982	1983	1984	1985
STRCUL	-.026	-.050	-.017	-.050
PLADEV	.218	.241	.296*	.175
SELASS	.205	.225	.109	.065
STREFF	-.211	-.218	-.248*	-.147
MGREFF	-.041	.014	.124	.184
OPEFF	-.110	-.064	.017	.098
MULT R	.351	.382	.418	.346
R-SQUARED	.123	.146	.175	.120
N	66	66	66	66

P < ****.001   ***.01   **.05   *.10

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1 Only respondents with business unit affiliations were
included in these and the subsequent regression analyses
(Wave 1 N=66; Wave 2 N=111) as they could properly be
matched to the financial performance data. Respondents
excluded from these analyses mostly occupy Corporate or
Group staff positions.

Table G.5A   Cross-Sectional and Lagged Effects of the 1982
HRM Indices on 1982-1985 Return on Investment[1]

	1982	1983	1984	1985
STRCUL	-.082	-.052	.006	.001
PLADEV	.005	-.069	-.078	-.094
SELASS	.286	.209	.067	.072
STREFF	.033	.078	-.035	-.024
MGREFF	.092	.102	-.062	-.058
OPEFF	-.026	.128	-.278**	-.269**
MULT R	.285	.303	.326	.321
R-SQUARED	.081	.092	.106	.103
N	66	66	66	66

P <   ****.001   ***.01   **.05   *.10

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[1] Only respondents with business unit affiliations were
included in these and the subsequent regression analyses
(Wave 1 N=66; Wave 2 N=111) as they could properly be
matched to the financial performance data. Respondents
excluded from these analyses mostly occupy Corporate or
Group staff positions.

Table G.5B   Cross-Sectional and Lagged Effects of the 1982
HRM Indices on 1982-1985 Return on Investment[1]

	1982	1983	1984	1985
STRCUL	-.077	-.042	-.009	-.032
PLADEV	-.024	-.070	-.018	-.101
SELASS	.287	.221	.179	.199
STREFF	.049	.085	.025	.081
MGREFF	.104	.089	.086	.097
OPEFF	.096	.168	.146	.175
MULT R	.369	.331	.301	.318
R-SQUARED	.136	.110	.091	.101
N	61	61	61	61

P <   ****.001   ***.01   **.05   *.10

1 The outlier was excluded from these analyses.

Table G.6   Cross-Sectional and Lagged Effects of the 1982
            HRM Indices on 1982-1985 Average Investment Rate[1]

	1982	1983	1984	1985
STRCUL	-.015	.002	-.029	-.001
PLADEV	-.135	-.211	-.201	-.109
SELASS	-.173	-.140	-.088	-.088
STREFF	.110	.178	.198	.096
MGREFF	-.068	-.063	-.057	-.059
OPEFF	.061	-.011	.007	-.036
MULT R	.285	.333	.298	.212
R-SQUARED	.081	.111	.089	.045
N	66	66	66	66

P <   ****.001   ***.01   **.05   *.10

1 Only respondents with business unit affiliations were
  included in these and the subsequent regression analyses
  (Wave 1 N=66; Wave 2 N=111) as they could properly be
  matched to the financial performance data. Respondents
  excluded from these analyses mostly occupy Corporate or
  Group staff positions.

Table G.7 Cross-Sectional and Lagged Effects of the 1982 HRM Indices on 1982-1985 Sales to Pay[1]

	1982	1983	1984	1985
STRCUL	.038	.104	.094	.086
PLADEV	.015	.162	.135	.020
SELASS	.068	-.010	.002	-.036
STREFF	.070	-.026	-.045	.092
MGREFF	.044	-.004	.023	-.000
OPEFF	.075	.008	.022	.111
MULT R	.230	.212	.202	.206
R-SQUARED	.053	.045	.041	.042
N	66	66	66	66

P < ****.001 ***.01 **.05
*.10

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1 Only respondents with business unit affiliations were included in these and the subsequent regression analyses (Wave 1 N=66; Wave 2 N=111) as they could properly be matched to the financial performance data. Respondents excluded from these analyses mostly occupy Corporate or Group staff positions.

Table G.8 Cross-Sectional and Lagged Effects of the 1982
HRM Indices on 1982-1985 Sales per Employee[1]

	1982	1983	1984	1985
STRCUL	-.017	.026	.025	.059
PLADEV	-.031	.059	.012	-.129
SELASS	.127	.072	.068	-.013
STREFF	.103	.037	.046	.177
MGREFF	.067	.039	.067	.011
OPEFF	.152	.096	.107	.140
MULT R	.292	.236	.231	.255
R-SQUARED	.085	.056	.053	.065
N	66	66	66	66

P < ****.001 ***.01 **.05
*.10

_____

1 Only respondents with business unit affiliations were
included in these and the subsequent regression analyses
(Wave 1 N=66; Wave 2 N=111) as they could properly be
matched to the financial performance data. Respondents
excluded from these analyses mostly occupy Corporate or
Group staff positions.

Table G.9 Cross-Sectional and Lagged Effects of the 1982 HRM Indices on 1982-1985 Value-Added Sales per Employee[1]

	1982	1983	1984	1985
STRCUL	-.078	-.132	-.135	-.146
PLADEV	-.164	.015	-.020	-.203
SELASS	.193	.242	.252	.178
STREFF	.213	.092	.060	.245
MGREFF	.032	.030	.108	.166
OPEFF	.066	.029	.071	.177
MULT R	.261	.246	.281	.385
R-SQUARED	.068	.060	.079	.148
N	66	66	66	66

P < ****.001 ***.01 **.05 *.10

[1] Only respondents with business unit affiliations were included in these and the subsequent regression analyses (Wave 1 N=66; Wave 2 N=111) as they could properly be matched to the financial performance data. Respondents excluded from these analyses mostly occupy Corporate or Group staff positions.

Table G.10 Cross-Sectional and Lagged Effects of the 1982
HRM Indices on 1982-1985 Gross Inventory Rate[1]

	1982	1983	1984	1985
STRCUL	.175	.085	.071	.103
PLADEV	.035	-.132	-.177	-.084
SELASS	-.268	-.176	-.138	-.109
STREFF	-.006	.120	.187	.158
MGREFF	-.151	-.155	-.144	-.136
OPEFF	-.188	-.161	-.121	-.222
MULT R	.365	.396	.376	.352
R-SQUARED	.134	.157	.141	.124
N	66	66	66	66

P < ****.001 ***.01 **.05 *.10

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1 Only respondents with business unit affiliations were
included in these and the subsequent regression analyses
(Wave 1 N=66; Wave 2 N=111) as they could properly be
matched to the financial performance data. Respondents
excluded from these analyses mostly occupy Corporate or
Group staff positions.

Table G.11 Cross-Sectional and Lagged Effects of the 1982 HRM Indices on 1982-1985 Scrap/Rework Rate[1]

	1982	1983	1984	1985
STRCUL	.020	.006	.050	-.027
PLADEV	.194	.146	.280*	.243
SELASS	-.210	-.222	-.245	-.124
STREFF	-.160	-.067	-.162	-.174
MGREFF	.014	-.052	-.101	-.143
OPEFF	.079	-.002	-.037	-.058
MULT R	.217	.202	.279	.296
R-SQUARED	.047	.041	.078	.087
N	66	66	66	66

P < ****.001 ***.01 **.05 *.10

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1 Only respondents with business unit affiliations were included in these and the subsequent regression analyses (Wave 1 N=66; Wave 2 N=111) as they could properly be matched to the financial performance data. Respondents excluded from these analyses mostly occupy Corporate or Group staff positions.

Table G.12 Lagged Effects of the 1982 HRM Indices on the 1985 HRM Indices[1]

	STRCUL 85	PLADEV 85	SELASS 85	STREFF 85	MGREFF 85	OPEFF 85
STRCUL 82	.236	-.204	-.100	.164	.193	.177
PLADEV 82	-.192	-.014	.043	-.150	-.105	.077
SELASS 82	.191	.660****	.375**	.039	.114	.190
STREFF 82	.029	.028	-.052	.065	-.064	-.074
MGREFF 82	-.296*	.219*	-.160	.046	-.056	-.056
OPEFF 82	.148	.060	.250	.128	.516****	.386***
MULT R	.413	.634	.422	.286	.586	.582
R-SQUARED	.171	.403	.179	.082	.343	.339
N	54	54	54	52	52	52

P < ****.001 ***.01 **.05 *.10

1 These analyses are based on the matched sample of Wave 1 and Wave 2 respondents (N=56). The slightly lower number of cases is due to missing data.

APPENDIX H

CROSS-LAGGED REGRESSION ANALYSES: THE FINANCIAL PERFORMANCE AND PRODUCTIVITY MEASURES AND THE STRATEGIC HRM AND HR EFFECTIVENESS INDICES

Table H.1 Cross-Lagged Effects of the 1982-1984
Financial Performance Measures on 1985
Structure/Culture[1]

	1982-1985	1983-1985	1984-1985
PERGR	.097	-.270**	.050
OPPLAN	-.059	-.166	-.130
ROI	-.025	-.271*	-.176
INVRAT	-.227	-.399**	-.276
MULT R	.182	.281	.112
R-SQUARED	.033	.079	.012
N	111	103	103

P < ****.001   ***.01   **.05   *.10

[1] One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The reduction in the number
of cases for 1983-1984 is due to the elimination of the
outlier.

Table H.2   Cross-Lagged Effects of the 1982-1984
            Financial Performance Measures on 1985
            Planning/Development[1]

	1982-1985	1983-1985	1984-1985
PERGR	.152	-.241**	.133
OPPLAN	.141	-.027	-.081
ROI	-.135	-.358***	-.353*
INURAT	-.151	-.359**	-.360
MULT R	.185	.292	.213
R-SQUARED	.034	.085	.045
N	111	103	103

P < ****.001   ***.01   **.05   *.10

_____

1 One-hundred and eleven of the 146 Wave 2 cases could be
  matched to business unit performance data and were thus
  available for these analyses. The reduction in the number
  of cases for 1983-1984 is due to the elimination of the
  outlier.

Table H.3   Cross-Lagged Effects of the 1982-1984
Financial Performance Measures on 1985
Selection/Assessment[1]

	1982-1985	1983-1985	1984-1985
PERGR	-.013	-.195*	-.104
OPPLAN	-.154	-.184	-.044
ROI	.096	-.109	.081
INVRAT	-.151	-.284	-.054
MULT R	.199	.210	.109
R-SQUARED	.039	.044	.012
N	111	103	103

P < ****.001 ***.01 **.05 *.10

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[1] One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The reduction in the number
of cases for 1983-1984 is due to the elimination of the
outlier.

Table H.4   Cross-Lagged Effects of the 1982-1984
            Financial Performance Measures on 1985
            Strategic HR Effectiveness[1]

	1982-1985	1983-1985	1984-1985
PERGR	-.132	-.100	-.092
OPPLAN	-.137	-.227	-.383*
ROI	-.141	-.208	-.177
INVRAT	-.317*	-.419**	-.531*
MULT R	.235	.219	.252
R-SQUARED	.055	.048	.063
N	111	103	103

P < ****.001 ***.01 **.05 *.10

1 One-hundred and eleven of the 146 Wave 2 cases could be
  matched to business unit performance data and were thus
  available for these analyses. The reduction in the number
  of cases for 1983-1984 is due to the elimination of the
  outlier.

Table H.5   Cross-Lagged Effects of the 1982-1984
Financial Performance Measures on 1985
Managerial HR Effectiveness[1]

	1982-1985	1983-1985	1984-1985
PERGR	.276***	-.452****	.135
OPPLAN	-.047	-.166	-.368*
ROI	.070	-.279**	-.190
INVRAT	-.202	-.344*	-.366
MULT R	.291	.413	.184
R-SQUARED	.084	.170	.034
N	111	103	103

P < ****.001   ***.01   **.05   *.10

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1 One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The reduction in the number
of cases for 1983-1984 is due to the elimination of the
outlier.

Table H.6 Cross-Lagged Effects of the 1982-1984
Financial Performance Measures on 1985
Operational HR Effectiveness[1]

	1982-1985	1983-1985	1984-1985
PERGR	.267***	-.354****	.177
OPPLAN	-.075	-.069	.075
ROI	.332*	-.034	.069
INVRAT	-.022	-.187	.081
MULT R	.314	.358	.218
R-SQUARED	.098	.128	.047
N	111	103	103

P < ****.001 ***.01 **.05 *.10

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1 One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The reduction in the number
of cases for 1983-1984 is due to the elimination of the
outlier.

Table H.7 Cross-Lagged Effects of the 1982-1984
Productivity Performance Measures on 1985
Structure/Culture[1]

	1982	1983	1984
STOPAY	-.202	.0264	-.158
SALEMP	.316	-.164	.111
VADSAL	-.215	.029	-.069
GINVNT	-.113	-.165	-.112
SCRAP	-.152	-.057	-.105
MULT R	.260	.220	.218
R-SQUARED	.068	.048	.048
N	111	111	111

P < ****.001 ***.01 **.05 *.10

_____

1 One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The outlier was retained
for these analyses as there are no significant differences
in its productivity results compared to the other ECG
business units.

Table H.8 Cross-Lagged Effects of the 1982-1984
Productivity Performance Measures on 1985
Planning/Development[1]

	1982	1983	1984
STOPAY	-.103	-.172	-.224
SALEMP	.220	.013	.197
VADSAL	-.254	.016	-.095
GINVNT	-.233*	-.234**	-.232**
SCRAP	-.036	.010	-.002
MULT R	.308	.282	.271
R-SQUARED	.095	.079	.074
N	111	111	111

P < ****.001 ***.01 **.05 *.10

1 One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The outlier was retained
for these analyses as there are no significant differences
in its productivity results compared to the other ECG
business units.

Table H.9   Cross-Lagged Effects of the 1982-1984
            Productivity Performance Measures on 1985
            Selection/Assessment[1]

	1982	1983	1984
STOPAY	.348	.473	.264
SALEMP	-.171	-.533	-.241
VADSAL	-.256	-.026	-.097
GINVNT	-.092	-.123	-.047
SCRAP	-.281***	-.211**	-.283***
MULT R	.315	.289	.303
R-SQUARED	.099	.084	.092
N	111	111	111

P < ****.001 ***.01 **.05 *.10

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1 One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The outlier was retained
for these analyses as there are no significant differences
in its productivity results compared to the other ECG
business units.

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Table H.10   Cross-Lagged Effects of the 1982-1984
             Productivity Performance Measures on 1985
             Strategic level HR Effectiveness[1]

	1982	1983	1984
STOPAY	-.614	.426	-.192
SALEMP	.785*	-.605	.206
VADSAL	-.181	.230	-.096
GINVNT	.109	-.066	-.021
SCRAP	-.258**	-.072	-.048
MULT R	.257	.166	.106
R-SQUARED	.066	.027	.011
N	111	111	111

P < ****.001 ***.01 **.05 *.10

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[1] One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The outlier was retained
for these analyses as there are no significant differences
in its productivity results compared to the other ECG
business units.

Table H.11   Cross-Lagged Effects of the 1982-1984
             Productivity Performance Measures on 1985
             Managerial level HR Effectiveness[1]

	1982	1983	1984
STOPAY	-1.01***	-.505	-.669*
SALEMP	.948**	.293	.515
VADSAL	-.012	.107	-.017
GINVNT	.032	-.016	.039
SCRAP	-.193*	-.057	-.090
MULT R	.323	.218	.263
R-SQUARED	.104	.048	.069
N	111	111	111

P < ****.001 ***.01 **.05 *.10

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1 One-hundred and eleven of the 146 Wave 2 cases could be
  matched to business unit performance data and were thus
  available for these analyses. The outlier was retained
  for these analyses as there are no significant differences
  in its productivity results compared to the other ECG
  business units.

Table H.12   Cross-Lagged Effects of the 1982-1984
             Productivity Performance Measures on 1985
             Operational Level HR Effectiveness[1]

	1982	1983	1984
STOPAY	-.241	-.687*	-.430
SALEMP	.148	.704	.299
VADSAL	.149	-.042	.173
GINVNT	-.173	-.082	-.028
SCRAP	.007	-.028	-.105
MULT R	.215	.228	.244
R-SQUARED	.046	.052	.060
N	111	111	111

P < ****.001   ***.01   **.05   *.10

[1] One-hundred and eleven of the 146 Wave 2 cases could be
matched to business unit performance data and were thus
available for these analyses. The outlier was retained
for these analyses as there are no significant differences
in its productivity results compared to the other ECG
business units.

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