

THE DIFFUSION OF TQM WITHIN A GLOBAL BANK

David Strang

ABSTRACT

This paper examines the diffusion of a multinational bank's quality initiative across functional and geographic boundaries. It demonstrates substantial regional differences in the volume and institutionalization of TQM activities, with slow development and little staying power in the U.S. and rapid expansion in Asia and Latin America. Event history analysis of quality team formation demonstrates that positive feedback occurs primarily within business divisions operating within national boundaries.

INTRODUCTION

The transfer of practices within firms is a core problem in strategic management. The capacity to learn from internal experience offers a source of difficult to imitate, and so potentially sustainable, competitive advantage (Barney, 1997). Research strategies vary from detailed institutional histories of corporate programs (Cole, 1999) to comparative reconstruction of technology transfer (Szulanski, 1996) to analysis of how access to different mixes of experience affects productivity (Argote, Beckman & Epple, 1990). Findings point not only to barriers to the transfer of best practice (Cohen & Levinthal, 1990) but to the hazards of inappropriate or irrelevant learning (Baum et al., 2000; Ingram & Baum, 1997).

A related stream of research in organizational sociology examines the diffusion of practices across organizations (for a review, see Strang & Soule, 1998).

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For example, Davis (1991) studies the spread of the poison pill via corporate interlocks, while Westphal et al. (1997) examine how inter-organizational ties influence whether organizations adopt customized or conventional forms of TQM. This literature is animated by an interest in the homogenization of practices within organizational fields (DiMaggio & Powell, 1983) and by a contrast between the social and efficiency-driven sources of organizational change. Inter-organizational diffusion is generally assumed to be undirected, with adoptions flowing along the lines of relevant social networks.

This paper examines the problem posed in strategic management with tools from the study of inter-organizational diffusion. Quantitative models of intra-organizational diffusion become practicable when organizations consist of many quasi-autonomous units operating in multiple markets. As Greve and Baum (2001) point out, multiunit multimarket organizations are on the rise, providing rich settings for the investigation of the spread of practices within the firm.

I model the diffusion of a corporate quality initiative within a multinational bank, here named "Global Financial." This program, launched in 1997, sought to achieve productivity improvements, expansion in customer capacity, and efficiency gains through individual training in quality tools, customer-focused measurement, and team-based change efforts. I focus on the latter, examining how the program developed across global regions and business units by tracking the formation of cross-functional process improvement (CFPI, or "quality") teams.

While beginning with different theoretical agendas and utilizing different methodologies, work on the transfer of best practice, organizational learning, and diffusion dynamics often reason along parallel lines. A fundamental claim is that the movement of practices from one location to another depends upon the relationship connecting the "sending" and "receiving" units. For example, Chacar and Lieberman (this volume) examine how the distance between pharmaceutical labs helps or hinders innovative activity, finding strong effects of international spillovers. Other work focuses on formal organizational linkages – Darr et al. (1995) show that learning occurs among pizza stores operated by the same franchisee, but not across franchises, while Greve (1995) finds that a new radio format diffused especially quickly among corporate "sister stations" operating in different markets. Finally, some analyses measure the strength of relations directly. For example, Szulanski (1996) finds high rates of transfer between business units whose members communicate easily and frequently, while Hansen (1999) demonstrates the different roles of strong and weak ties in supporting project development.

A second claim is that diffusion is rapid when the new practice and the adopting organization are in some sense "compatible." Compatibility may be viewed in technical terms, where the practice solves the problems faced by the adopting

organization and is consistent with its technology (for example, see Sitkin et al., 1994). Or fit may be understood in cultural terms, indexing the match between the implicit meanings attached to the practice and the cognitive and normative assumptions of the adopter (Kedia & Bhagat, 1988; Kostova, 1999).

The case of TQM suggests arguments about both corporate social structure and the adoption propensities of different organizational units. In examining the network structure of diffusion, I ask whether team formation seems more related to geography (spreading within nations across business units) or to function (spreading within business units across nations). In studying the propensities of different units to form teams, I ask whether the timing of adoption across businesses in different markets reflects technological or cultural fit. While the analysis presented here forms a first cut into a complex diffusion process at Global Financial, it provides insight into how the program developed across geographically and functionally differentiated businesses.

GLOBAL FINANCIAL'S QUALITY INITIATIVE

Global Financial's Corporate Quality Initiative began in the 1st quarter of 1997. It was not the first total quality effort mounted by the organization – most notably, there had been a substantial quality program in its credit card business in the early 1990s. Quality departments were also well institutionalized within Global Financial, most prominently in the Consumer Bank. But the Corporate Quality Initiative stood out as the bank's first corporate-wide quality effort and the first quality program that had the personal support of the bank's CEO.

The quality initiative was announced as a vehicle for profound organizational change. In response to the question "The quality initiative – why now?," Global Financial's CEO described the program to Globalbankers:

We must distinguish our presence. Its demanded by the world, will deliver services in a framework that's never existed. This program will touch every Globalbanker, all 92,000. We're living in a world where must energize everybody in the company, and historically we haven't done that.

Despite considerable visibility as the bank's "breakout strategy," Global Financial's Corporate Quality Initiative possessed minimal organizational infrastructure. A new quality office was formed under the directorship of one of the firm's 12 executive vice-presidents, a long-standing corporate leader who had established a TQM in the bank's Credit Cards division some years before. A total of sixteen quality professionals made up the staff of the Corporate Quality Office. They were aided by an executive on loan from Motorola, whose Six Sigma™ methodology

and cross-functional process improvement approach formed the building blocks of the bank's program.

The Corporate Quality Office did not act alone, of course. It worked in partnership with the bank's established quality control departments, which were particularly active in the bank's branch banking and consumer operations. But the Corporate Quality Office lacked line authority over these departments, whose directors reported to the business heads of their divisions.

The organizing idea was that quality was "everyone's job." Expansion of the bank's quality personnel and the formation of a powerful corporate office with line authority were avoided as fostering a quality bureaucracy. When asked who was responsible for the initiative, the CEO replied "each of us. This is how we are going to work. . . . I'm going to have a few projects on my personal quality."

Operationally, the quality initiative involved three main activities. First, all bank employees were to receive formal *quality training*. This training was organized to cascade through the organization, with executives and top managers participating in a first wave of training, followed by their direct reports, and on down through front-line workers. Quality training involved two broad components: a statistical language for describing organizational performance and a behavioral focus on team building, cooperation, and organizational values.

Second, operational units were asked to report their performance on a series of *quality metrics*, which counted "defects" in customer interaction like delays in account openings and credit decisions. The Corporate Quality Office maintained a database of scores across business units, whose participation was voluntary. In keeping with the central office's lack of line authority, business units were also permitted to redefine metrics to fit local circumstances.

Third, managers could form *cross-functional performance improvement (CFPI, or quality) teams* to address business challenges. These teams formed the "business end" of the corporate initiative, linking the quality methodology to concrete organizational goals. Typical projects sought to reduce errors in reported account balances, increase check processing capacity, and develop strategies for cross-selling financial products. Team sponsors within operational divisions identified the team's "critical business problem" and recruited participants, while quality personnel provided facilitation and support. The average project lasted about a year, with participants adding project tasks to their regular responsibilities.

Each of these activities was substantial in scope. While I lack an official count, a random sample survey of U.S. employees found that 82% of respondents had received quality training (Strang & Jung, 2002). Two quarters after the initiative began, 36 of the bank's 46 major business units were reporting scores on quality metrics. And over 1200 quality teams were formed across Global Financial.

DIFFUSION PROCESSES AND ORGANIZATIONAL PRACTICES

While virtually any practice can be said to diffuse, some are more usefully examined within a diffusion framework than others. Several key characteristics figure in Everett Rogers' definition:

Diffusion is the process by which: (1) an innovation; (2) is communicated through certain channels; (3) over time; (4) among the members of a social system (Rogers, 1983, p. 11).

These components exhibit an elective affinity, with communication at their core. The novelty of an "innovation" implies a substantial role for information exchange and influence, since the absence of direct experience places a premium on what one can glean from the experience of others. Communication occurs over time, establishing a sequential ordering of adoptions that facilitates causal analysis. And meaningful contact is more likely if potential adopters are linked as members of a social system.

When the notion of diffusion is applied to an organizational setting, a bit more specification is needed. Diffusion models are models of interdependent choice, where actors are influenced by the prior decisions of others. Programs that involve little choice, particularly those implemented in a top-down fashion, may be more effectively approached from other vantage points. For example, the granting of stock options based on length of service with the firm might be better treated as an optimization problem for a human resource manager than as a process of contagion linking recipients. If we range organizational programs from "involuntary and engineered" to "voluntary and emergent," diffusion models become more appropriate as we move towards the latter pole.

Global Financial's quality initiative was far along the "voluntary" end of the continuum, so much so that Strang and Jung (2002) describe it as an "orchestrated social movement." The bank's corporate quality office lacked the authority to direct quality activities within business units. Instead, quality professionals played the role of activists, seeking to promote quality methods and get employees involved. In the case of quality teams, this meant that the central office provided templates for how teams and their activities should be structured and made facilitators and trainers available, but left it to business units to decide whether teams should be formed and what projects they would address.

The formation of quality teams fits with a diffusion approach from a substantive perspective as well. Cross-functional group efforts were a novel vehicle for solving organizational problems. In fact, much about quality teams was in opposition to business as usual at Global Financial: they sought to introduce a

more cooperative ethos within a highly competitive organization, diminish a "silo mentality" by stressing cross-functional interdependencies, and get managers, technical personnel, and front-line employees to work together closely without formal attention to rank. Communication and learning about the new management strategy were central to whether quality teams would get off the ground or not.

HYPOTHESES

Diffusion Channels

The simplest model of social influence is homogeneous mixing, where all teams within the organization affect each other in the same way. Under this hypothesis, the formation of a team in Colombo, Sri Lanka has the same impact on the subsequent rate of team formation in Manhattan that it has on subsequent team formation in India. This idea is both implausible and uninformative. Homogeneous mixing serves best as a baseline from which to examine evidence of social structure (Strang, 1991).

One potential channel of diffusion is the bank's formal organizational structure. Global Financial's operations are administered on a product and consumer basis, grouping units that deal with the same types of clients and the same sorts of financial transactions. The bank is made up of three primary divisions: the Corporate Bank (where corporations are clients), the Consumer Bank (where individuals are clients), and the Private Bank (where wealthy individuals are clients). These three divisions are internally differentiated by function (for example, branch banking is separated from student loans in the Consumer Bank) and by geographic location.¹

Managers who work in the same division may constitute reference groups. Since advice and other social networks are often strongest among peers, cohesive linkages between managers may promote within-division diffusion. In addition, managers who report to the same boss are implicitly (or explicitly) in competition, and so may be highly sensitive to what each other do.

Diffusion within Global Financial's "businesses" is further promoted by commonalities in the problems that managers face. For example, loan officers all over the world seek to make loan decisions expeditiously (even if it does not seem so on the receiving end). If a quality team in Singapore successfully addresses a bottleneck, it provides a success story that branch banks elsewhere can duplicate. The corporate quality office publicized the achievements of CFPI success stories at Global Financial to stimulate just this sort of learning across units.

Hypothesis 1. Quality teams diffuse within business divisions more rapidly than they diffuse across business divisions.

A second potential channel of diffusion is geographic proximity. During the period of its corporate quality initiative, Global Financial had operations in 92 countries across six continents. Collocation may allow news of team activities to move more rapidly within countries than across them. For example, a manager in the Consumer Bank in Manila may hear more about the quality team experience of Global Financial's Corporate operations elsewhere in the Philippines than she does about Consumer Bank quality teams in Saudi Arabia.

In addition, common national background facilitates communication and influence. How teams were interpreted and enacted may vary with cultural assumptions about teamwork, power, and inequality. Effective communication about quality team formation and implementation may occur more easily between co-nationals who share cultural assumptions about how best to organize work.

Hypothesis 2. Quality teams diffuse more rapidly within countries than across countries.

Taken together, the two hypotheses proposed above suggest that influence should be strongest where managers are in the same business division and the same country. For example, teams formed within Egypt's Corporate Bank should have a larger impact on the future formation rate of teams within Egypt Corporate than they do on either Egypt Consumer or (say) Japan Corporate. When divisional and country connections are present, all the mechanisms discussed above are at work. National business units combine reporting and co-working relationships, geographic proximity, technological commonalities, and cultural commonalities.

Hypothesis 3. Quality teams diffuse most rapidly within country-business units.

Organizational Propensities

Net of diffusion effects per se, organizational characteristics may affect the propensity to form quality teams. Here I focus on two broad sets of arguments: those having to do with technology and task structure, and those based on national cultural orientations.

Advocates often make bold claims for TQM's universal applicability. For example, Deming (1982, p. 23) says that his 14 points "apply anywhere, to small organizations as well as large ones, to the service industry as well as manufacturing. They apply to a division within a company." Identification of

total quality with customer satisfaction, continuous improvement, and worker empowerment casts a pretty wide net.

But examination of the roots of TQM suggests the value of a contingency approach. Total quality grew out of the intersection of two disparate workplace technologies: the work of Shewhart (1931) and others applying statistical analysis to production processes and the wing of the human relations/human resources tradition (Roethlisberger & Dickson, 1939) that focuses on small group activities. The home territory for this combination was that of large manufacturers in industries like automobiles and electronics, where statistical analysis is feasible and the need for worker participation apparent.

While practitioners have sought to generalize TQM, these technical roots continue to shape the approach. For example, Motorola's Six Sigma™ approach aims to reduce organizational defects to a frequency of approximately one per million. This only makes sense when applied to high volume processes that are both stable and analyzable (Sitkin et al., 1994). Discussion of errors per million is meaningless when a problem arises a few times a year, or when customer interactions involve long-term relationships. A logic of technical contingency thus suggests that

Hypothesis 4. Quality teams will be formed more rapidly in business units involving high volumes of standardized, short-term transactions.

One can alternatively approach the organization with a cultural lens, looking for differing conceptions of effective and appropriate action. Where the total quality framework is consistent with underlying cultural orientations, quality teams should be formed more extensively and rapidly. Where the two are opposed, one would expect halting diffusion of the program.

Identification of TQM's cultural commitments is non-trivial. If we examine the rhetoric of total quality (Zbaracki, 1998), the number of bases covered is remarkable. TQM articulates a vision of organizational reform that is at once scientific (decision-making as statistical problem-solving), social (cooperation and teamwork), personal (expanded commitment and skill development), and managerial (leadership from the top, empowerment, and a corporate-wide effort).

One way of separating the wheat from the chaff in these multiple meanings is to see how individuals armed with different cultural orientations evaluate TQM. Sine and Strang (2001) do this in an analysis of quality team participants across eleven countries, asking how endorsement of TQM principles² relates to value orientations like collectivism, power distance, and uncertainty avoidance (Hofstede, 1991). They find a strong tendency for collectivists to view TQM more positively than individualists do, in line with total quality's emphasis on cooperation, teamwork, and group problem-solving. Sine and Strang also find, more surprisingly, that uncertainty avoiders embrace TQM principles more

strongly than uncertainty seekers do – apparently because TQM's fact-based and highly structured methodology reduces ambiguity. If these individual-level attitudes translate into aggregate responses to TQM across culturally distinctive businesses,

Hypothesis 5. Quality teams will be formed more rapidly in geo-cultural regions with low levels of individualism and high levels of uncertainty avoidance.

DATA AND METHODS

Event history analysis provides a regression-like framework for modeling the occurrence of qualitative events over time. Event history methods also provide a natural framework for the study of diffusion processes, particularly where the goal is to specify channels of influence within a social structure (Strang, 1991).³

Global Financial's Corporate Quality Office maintained an extensive database on CFPI (quality team) projects. Records include information on the timing of project activities: the date when teams first met, the dates of standard "milestone" meetings (such as when the team moved from analysis of current practice to recommendations for change, and from recommendations for change to implementation), and the date when the project was completed or terminated. The Corporate Quality Office's database provides information on the team's business unit and country location, as well as detailed descriptions of the nature of the project and of project outcomes. Here I employ a small subset of this data to track the formation of quality teams across countries and business divisions.⁴

Our analysis begins January 1, 1997, the beginning of the quarter when Global Financial's corporate quality initiative was launched. It ends on May 15, 2000, the last date covered in the quality team archives obtained from Global Financial. While the quality initiative formally continued for some months after this date, the program was winding down before early 2000. Right censoring, or failure to observe events occurring after the observation period, is thus of limited magnitude as well as methodologically unproblematic within an event history and diffusion framework (Greve et al., 2001; Tuma & Hannan, 1984).

Event history analysis models the rate at which social entities (individuals, organizations, nation-states) move from one qualitative state to another – for example, from marriage to divorce, or from non-adoption to adoption of a TQM program. This poses a methodological problem for the study of project starts, since teams do not exist prior to their formation and so cannot be considered "at risk." And it is impractical to consider the set of all possible quality teams as candidates for formation.

The solution is to treat organizational units as the cases at risk and to investigate variation in the waiting time between successive starts within each unit. This strategy was first described in some detail by Hannan and Freeman (1987) in an analysis of the birth of national labor unions, where the U.S. served as the case at risk of a union founding.

The organizational units examined here are defined on the basis of national location and business activity. Outside the U.S., national divisions of the multinational's three main businesses (the Corporate, Consumer, and Private Banks) form the potential units. Attention is restricted to business units employing at least 50 people. Countries where Global Financial has operations may have one, two, or all three divisions that meet this cutoff and so are included in the analysis. For example, Switzerland has substantial Corporate, Consumer and Private Banking operations, while Benin has only a Corporate Bank.

Within the U.S., where about half of all Global Financial employees are based, a more fine-grained set of ten business units is identified. These include organizations like Global Financial's Branch Banking system (part of the Consumer Bank) and Foreign Exchange (part of the Corporate Bank). I exclude departments that are not part of either the Consumer, Corporate, or Private Banks – many of which provide technical support for the businesses examined here.

Table 1 links business units at Global Financial to Hypotheses 4 and 5. According to Hypothesis 4, TQM should be most technically compatible with the work of the Consumer Bank, where millions of individuals conduct standardized transactions with the bank – most clearly in the case of credit card operations, where Global Financial's operations resemble factories processing a vast paper trail. The Private Bank appears to have the worst technical fit with TQM, since here a small number of wealthy individuals receive personalized financial services.

Table 1 also displays mean levels of individualism and uncertainty avoidance of countries within each region, drawn from Hofstede's (1980) cross-national survey of IBM employees. Hypothesis 5 argues that we should expect particularly high rates of team formation in Latin America, which scores the lowest on individualism and the highest on uncertainty avoidance of the five regions.⁵ North America forms a polar case, where high scores on individualism and low scores on uncertainty avoidance oppose TQM's cultural commitments. Asia, Africa & the Middle East, and Europe stand in the middle, with the first two regions displaying low individualism but moderate uncertainty avoidance, and Europe showing high individualism and high uncertainty avoidance. Since Sine and Strang (2001) found individualism-collectivism to be the strongest cultural predictor of attitudes towards TQM, I expect high rates of team formation in Asia and in Africa and the Middle East and moderate rates of team formation in Europe.

Table 1. Variation in Workplace and Cultural Characteristics across Business Divisions and Regions at Global Financial.

	Customer Transactions	Individualism	Uncertainty Avoidance	Predicted Rate of Team Formation
Divisions				
Consumer Bank	High Volume, Standardized, Short-term			High
Corporate Bank	Medium Volume, Moderately Standardized, Long-term			Medium
Private Bank	Low Volume, Personalized, Long-term			Low
Regions				
North America		85.5	47.0	Low
Latin America		21.1	81.1	High
Western Europe		64.5	74.3	Medium
Africa and Middle East		33.5	58.7	High
Asia		34.7	52.7	High

Note: Individualism and Uncertainty Avoidance give means across countries within each region, taken from Hofstede (1991).

DESCRIPTIVE ANALYSIS

Figure 1 shows the cumulative number of CFPI teams formed at Global Financial during its Quality Initiative. Colombia's Consumer Bank established the first such team on March 15, 1997 to expedite auto loans. In all, a total of 1,291 quality teams were set up at Global Financial. The last CFPI team formed during the observation period was established to improve the customer database of Venezuela's Corporate Bank on April 26, 2000.

The rate of quality team formation follows the logistic trajectory found in most diffusion studies. During the early months of Global Financial's initiative, teams were formed at a halting pace (only 32 starts take place in 1997). Team formation took off in 1998, with 223 teams formed in the first half of the year, and 377 in the last six months of 1998. While there was much team activity in early 1999, by the end of the year starts had begun to tail off. Only 84 teams were formed at Global Financial after December 1999.

Team formation in the first two years of the quality initiative suggests a contagion from prior to potential adopters. At the program's outset, it is plausible

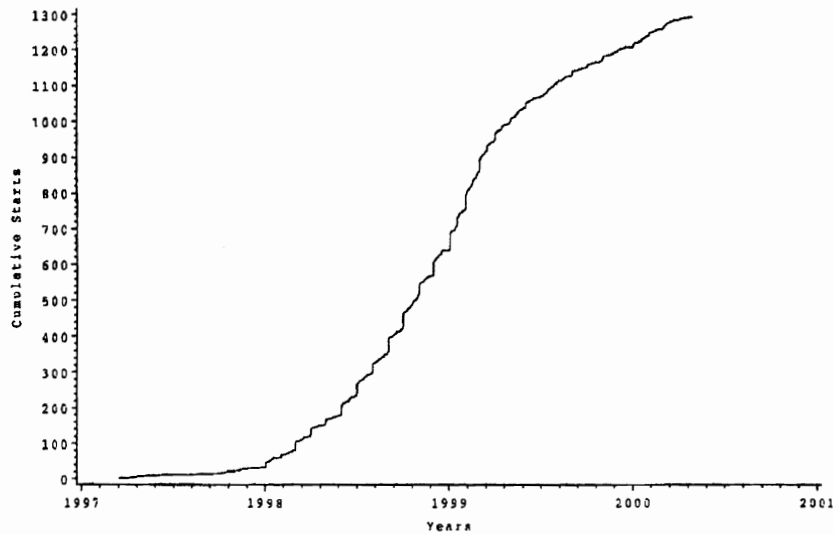


Fig. 1. Quality Team Starts.

that most managers at Global Financial were aware of the opportunity to form quality teams but unsure about how teams might operate and whether they would be useful or a waste of resources. The experiences of other managers with quality teams provided credible information that helped resolve these concerns, aiding the takeoff in team starts that occurs in the second and third quarters of 1998.

But standard diffusion arguments do *not* predict that cumulative team formation should plateau after this mid-period acceleration of activity. The usual rationale for an S-shaped diffusion pattern is that there are few "infecteds" at the beginning of a process and few "susceptibles" at its end. But since project formation is a repeatable event with no hard resource constraint,⁶ the number of susceptibles (i.e. the number of business units that can form quality teams) is a constant. Positive feedback in this case should produce an exponential rather than a logistic curve.

The deceleration in team starts in late 1999 and 2000 suggests a damping mechanism not envisaged in standard diffusion modeling. Some businesses may have exhausted the set of projects to which they perceived cross-functional process improvement teams could be usefully applied. More intriguingly, long-term negative feedback might have accompanied short-term positive effects. For example, the formation of a quality team might immediately boost "copycat" teams, but over time its impact would be to diminish additional team starts as operational difficulties become known.

A simpler global mechanism is almost surely present. Discussions with corporate managers and quality professionals at Global Financial made it clear to us that the bank's corporate quality initiative lost credibility over time. What began as a program promoted by the CEO ended as a program whose support within top management circles had largely eroded.⁷ One quality professional described increasing "push back" as business units resisted pressures to expend resources on quality training or teams.

A thorough effort to represent and test these sorts of underlying processes is beyond the scope of this paper, and the analysis below remains within the "positive feedback" assumptions of standard diffusion models. The late period decline in team formation is controlled statistically via partial likelihood estimation rather than modeled explicitly.

VARIABILITY ACROSS UNITS

Figure 2 presents cumulative quality team starts by global region, while Fig. 3 categorizes the same projects by business division. The two graphs point to substantial variation in quality team activity across Global Financial. Regionally, Asia and Latin America show much higher rates of team formation than North America

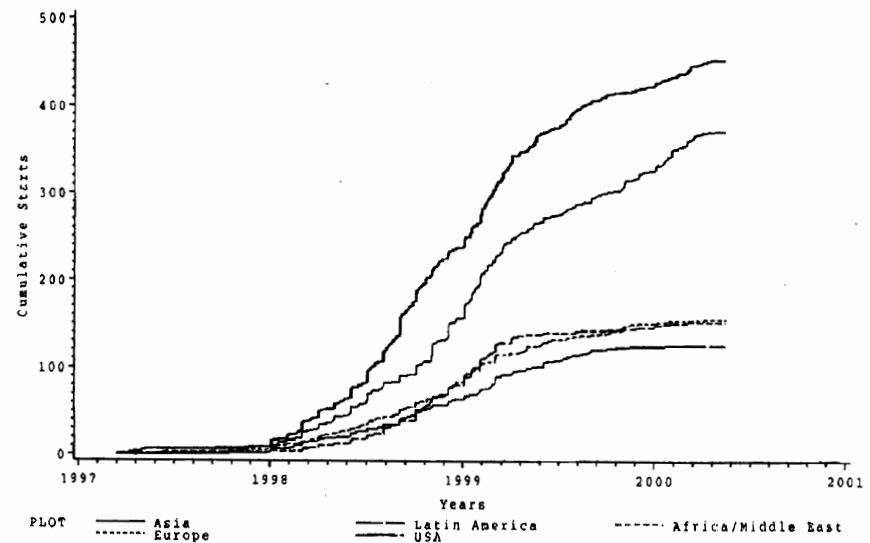


Fig. 2. Quality Team Starts by Region.

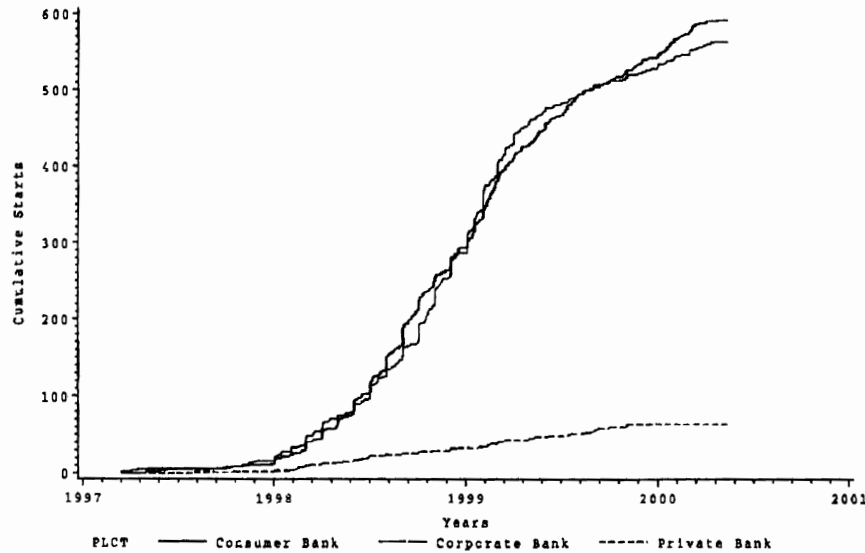


Fig. 3. Quality Team Starts by Business Division.

or Western Europe. When we categorize teams by business divisions, nearly all teams are formed within the Consumer and Corporate Banks, with only 66 started by the Private Bank.

Adjustment for organizational size brings this picture into clearer focus. Table 1 provides summary statistics relating quality team starts to the numbers of business units and employees across Global Financial's divisional and regional operations. Asia, Central & Eastern Europe, and Latin America continue to stand out as parts of the bank where business units were most likely to organize teams. North America and Western Europe are shown to be even greater laggards once we adjust for organizational size, since these are the centers of Global Financial's largest operations.

DIFFUSION MODELING

The heterogeneous diffusion framework proposed by Strang and Tuma (1993) provides a quite general formulation for the study of diffusion processes. Here the hazard is treated as an vector of intrinsic propensities multiplied by a function of prior events (occurring to cases s) weighted by their proximity to the

focal adopter n :

$$h_n(t) = \exp \left(\alpha' x_n + \sum_{s \in S(t)} [\beta' x_n + \gamma' w_s + \delta' z_{ns}] \right). \quad (1)$$

This approach can represent both structural hypotheses about the proximity of business units (as suggested in Hypotheses 1–3) and intrinsic differences across units (as suggested in Hypotheses 4 and 5). Greve et al. (1995) examine the estimation properties of this class of models.

We estimate the diffusion model shown above with Cox's (1975) partial likelihood method for estimating proportional hazards models. This strategy has the virtue of controlling for unobserved temporal variations in the hazard that are shared by all cases at risk – the most evident component of which is temporal decline in senior manager support for the initiative.

DIFFUSION PATTERNS

We begin with the diffusion structure of quality team starts. Table 2 reports the results of analyses examining Hypotheses 1–3 relative to a baseline hypothesis of "global diffusion" where all teams and business units influence each other equally. Diffusion "within country" examines the extent to which prior teams in the same nation stimulate new team formation, diffusion "within division" examines influence within the Corporate, Consumer, and Private Banks across countries, and diffusion within "country and division" examines influence within businesses within each nation.

Table 2. Quality Teams by Business Division and Region at Global Financial.

	Quality Team Starts	Business Units	Teams per Business Unit	Employees	Teams per 1,000 Employees
Consumer Bank	589	47	13.7	60,962	9.6
Corporate Bank	561	73	7.8	27,442	20.9
Private Bank	64	14	4.7	3,778	16.9
North America	125	18	6.9	46,739	2.6
Latin America	370	37	10.0	13,980	26.4
Western Europe	74	23	3.2	17,110	4.3
Central and Eastern Europe	84	8	10.1	2,375	34.1
Africa and Middle East	151	30	5.0	3,936	38.3
Asia	451	35	12.8	17,531	25.7

Table 3. Maximum Likelihood Estimates of the Formation of Quality Teams within Business Units at Global Financial (1997–2000).

Diffusion Within	Separate Effects	Δ Log Likelihood ^a
World	0.0004***	
Country	0.012***	51
Division	0.001***	60
Country and division	0.064***	311

^a Relative to homogeneous mixing within Global Financial.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

When examined in isolation, positive reinforcement arises in all partitions of Global Financial's business units. But it seems clear that the dominant diffusion channel is simultaneously within country and division. A project within the same nation and division increases the rate of future team starts by about six percent ($\exp[0.063] = 1.066$). This multiplier is six times larger than that of projects in the same country, sixty times larger than projects in the same division, and 150 times larger than projects anywhere at Global Financial. In areas of the bank with extensive CFPI activity, these effects add up. For example, by the end of 1998 Singapore's Corporate Bank had an estimated team formation rate some ten times higher than the year before, and by the end of 1999 its formation rate had doubled once again.

The first column of Table 3 extends this conclusion, examining the joint impact of diffusion within division, country, and country & division.⁸ Again, country and division appears to be the main channel of influence, with an estimated effect more than an order of magnitude larger than the other two groupings. There is also some indication of diffusion within divisions, suggesting influence that runs along functional lines.

Additional models in Table 4 introduce indicator variables for Global Financial's three divisions and six global regions (the Consumer Bank and North America form omitted categories). Global Financial's Private Bank shows many fewer team starts than Global Financial's Corporate and Consumer Banks. Latin America, Asia, and Central and Eastern Europe are geographic centers of quality team activity, while Western Europe and North America produced few teams (especially given the large presence of the bank in these regions). The impact of prior starts within country & division is unchanged by the addition of direct divisional and regional effects, but evidence for divisional diffusion disappears when simple differences between the Private, Corporate and Consumer Banks are added to the analysis.

These findings are reasonably consistent with the logics underlying Hypotheses 4 and 5. The low level of activity within the Private Bank fits well with an

Table 4. Partial Likelihood Estimates of the Formation of Quality Teams within Business Units at Global Financial (1997–2000).

Diffusion within				
Country	-0.003	-0.003	-0.000	-0.001
Division	0.001**	-0.000	0.001*	-0.000
Country and division	0.070***	0.067***	0.060***	0.057***
Divisions				
Corporate Bank		-0.079		-0.074
Private Bank		-0.595*		-0.491*
Regions				
South America			0.639***	0.605***
Western Europe			-0.320	-0.345
Central and Eastern Europe			0.633***	0.591**
Africa and Middle East			0.184	0.146
Asia			0.510***	0.478***
(Log) Unit employment	0.063***	0.056***	0.097***	0.088***
Log likelihood	331.5***	339.3***	411.9***	416.8***

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

argument about technical contingency, since managing the finances of very wealthy individuals involves highly personalized transactions and the development of long-term relationships. High levels of team activity in Asia and Latin America are in line with cultural arguments about the implicit collectivism and uncertainty avoidance of TQM. Low levels of team activity in North America are consistent with Hofstede's (1991) finding that American workers score low on uncertainty avoidance and at the bottom on collectivism.

However, arguments about technical and cultural compatibility are weakened by the dogs that didn't bark. It is surprising that there is no difference in rates of team formation between Consumer and Corporate operations (and in fact, more team starts per employee in the latter). While neither business is marked by the long-term, highly relational transactions that characterizes the Private Bank, the two are hardly technical twins. The Corporate Bank offer hundreds of companies very complex services (for example, moving funds from one emerging market to another) while the Consumer Bank serves millions of individuals whose banking needs are almost indistinguishable. But the more standardized operations of the Consumer Bank do not translate into more team activity.

The high rate of project formation in Central and Eastern Europe suggests caution as well. While Hofstede gathered little data on the value orientations of these societies (which were behind the Iron Curtain at the time of his research

on IBM), it seems unlikely that Hungary or Poland would be culturally closer to Asia or Latin America than to Western Europe. Indeed, accounts of the emerging capitalist (dis)order of Eastern Europe stress rampant individualism, low trust, and the ability to do business in a highly unstable legal and normative setting (Stark, 1996). High rates of team formation in countries like Czechoslovakia suggest that regional differentials may be driven by the pace of economic development and new business opportunity rather than cultural affinities.

While it is unclear how best to interpret regional effects, it is undisputable that geography forms the major source of variation in quality team activity. Differences between functional divisions add less to an account of the diffusion of the corporate quality initiative, especially since the two major divisions are nearly indistinguishable. (To see this, compare the small increment in log-likelihood when divisions are added to the analysis to the large one accompanying the introduction of geographic effects.) Global regions explain much more, with marked differentials in rates of team formation in Asia, Latin America, Europe, and North America.

DISCUSSION

While sharing knowledge within the firm can be seen as the basis for the multinationals very existence (Kogut & Zander, 1993), the movement of practices across geographically and functionally distant units is seldom easy. Inspection of the way quality teams diffused across Global Financial suggest two main findings relevant to emerging understandings of intra-corporate learning and imitation.

First, learning and communication occur primarily within rather than across business units. Only when managers share national background *and* functional concerns do we see strong evidence of influence. TQM at Global Financial seems driven by positive reinforcement at the local level, with weak evidence of diffusion across functionally distinct units operating in the same country or functionally similar units operating in different countries.

One interpretation is that meaningful communication requires the coincidence of shared cultural assumptions about teamwork (provided by common national background) and shared functional concerns (provided by common division). To communicate, managers have to talk the same language. They also have to have something to talk about.

An alternative interpretation is that influence is activated by co-location within an authority structure. Managers who report to the same boss may be driven to mimic each other's actions for fear of falling behind in a palpably competitive environment. Burt (1987) builds a general analysis of contagion on just this idea,

arguing that interaction frequency is much less relevant than implicit attention among actors who can potentially replace each other.

From a different perspective, the absence of long-distance learning may tell us something important about TQM. Work on intra-organizational transfer and inter-organizational diffusion finds that practices that are simple, legitimate, and context-independent are able to move across weak ties, while complex, illegitimate, and context-dependent practices require stronger relations to "carry the freight" (Zander & Kogut, 1995). For example, Hansen (1999) shows that simple, codified project knowledge diffused among weakly linked units, while more complex and more tacit knowledge spread only where inter-unit ties were strong. Davis and Greve (1997) find that the normatively legitimated "poison pill" spread via the relationally thin vehicle of corporate board interlocks, while the illegitimate "golden parachute" diffused via relationally dense metropolitan business communities.

The fact that quality teams diffused in very local ways thus suggests that TQM may have been viewed by many Globalbankers as illegitimate or ineffective. Many aspects of the total quality approach clashed with Global Financial's corporate culture, which celebrated a sometime harsh competitiveness and showed antipathy for "behavioral engineering." And Global Financial's initiative occurred well after the upswing of enthusiasm for TQM in the early 1990s, at a point when the very term was often greeted with disdain. (In point of fact, Globalbankers never used the term "TQM" to describe their program, for just this reason – preferring "quality" or "corporate quality initiative" instead).

Second, the largest differentials in program activity across Global Financial are geographic. Asian businesses formed 36% of the bank's quality teams while representing only 17% of bank employment. At the other extreme, 45% of Global Financial's employees, as well as its headquarters, are in North America – but this region was the home of only 9% of the corporation's teams.

The major role of geography is highlighted by the lesser impact of the sort of work done in the bank's business divisions. A cogent argument can be made that TQM best addresses the needs of organizations that perform large numbers of standardized transactions. In fact, thoughtful managers at Global Financial made just this argument to us. But differences in quality team activity across two technologically distinct business divisions are negligible at best.

This paper has considered one account of geographic differentials – that they are rooted in different "mental models," particularly those linked to individualism/collectivism and to uncertainty avoidance. This argument is consistent with important aspects of the regional diffusion of quality activities, and particularly with some of the most extreme cases – the very high rate of team formation in Asia and Latin America, and the very low one in the U.S. But other features of the geographic distribution of quality teams, most notably the high rate of activity in

Central and Eastern Europe, suggest the limits of a narrowly cultural explanation.

To better pin down the sorts of factors involved, of course, it is necessary to explicitly measure characteristics of business units and the environments where the firm operates. These include not only variation in cultural orientations but also in organizational structures and organizational environments. Results here suggest that close attention be paid to measuring characteristics that vary across geographic space.

This raises a more general point. Much organizational theorizing usefully conceptualizes geography as representing stocks of resources and stocks of information. For example, Sorenson and Audia (2000) examine the sources of geographic concentration in the footwear industry from this perspective. But geography can also index cultural and structural characteristics that lead spatially dispersed organizations to approach similar problems in very different ways (for example, see Dore, 1973; Guillen, 1994; Lincoln & Kalleberg, 1992; Maurice et al., 1980). For the spread of TQM at Global Financial, geography is important because it captures "the way we do things around here."

NOTES

1. Other smaller business units include Global Financial's e-commerce development group and its human resources department.

2. These principles are "focus on customer satisfaction," "focus on cross-functional processes," "group effort rather than individual effort," "openness to experimentation and change," "development of interpersonal skills," "empowered to directly implement change," "roles based on expertise, not status," and "structured problem-solving techniques and statistical tools."

3. An alternative strategy focuses on the aggregate shape of the adoption curve (in this volume, Edling and Liljeros provide an example of this approach in modeling the spread of the trade union movement in Stockholm). This alternative approach allows specification of the functional form of contagion process but makes it difficult to identify diffusion channels.

4. I lack independent measures of team formation with which to check the completeness of Global Financial's database. However, corporate quality staff who formed and supported teams at Global Financial confirmed that the patterns of geographic and functional variation shown here are consistent with their own understanding of team formation across the bank, and with separate reporting systems not made available to us.

5. Global Financial data also allow examination of a sixth region, Central and Eastern Europe, which is not well represented in Hofstede's research.

6. There is no theoretical limit to the number of quality teams a business unit could form, since Globalbankers could participate on multiple concurrent projects. None of the businesses examined here involved a large percentage of their employees.

7. This erosion was strongly linked to shifts in bank leadership, though we suspect it is too simple to view it purely as a matter of the personal inclinations of top executives.

Strang and Jung (2002) show that late in the initiative support for the bank's program was strongest among front-line workers and weakest among professional and managers.

8. To better distinguish the channels, here I compute "national" diffusion as the influence of prior starts in the same nation but not the same division, and "divisional" diffusion as the influence of prior starts in the same division but not the same nation. Business unit size is controlled through inclusion of (log) employment.

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