

Participatory Improvement at a Global Bank: The Diffusion of Quality Teams and the Demise of a Six Sigma Initiative

David Strang and Dong-II Jung

David Strang
Cornell University,
USA

Dong-II Jung
Hallym University,
South Korea

Abstract

This paper traces the diffusion of cross-functional process improvement teams in a multinational bank's Six Sigma program. Rates of team formation were high where clerical workers received low wages relative to managers and professionals, experienced weak wage growth, were less likely to rise into supervisory positions, and formed a shrinking proportion of bank employment; and where managerial and professional wage gains and employment growth were strong. These conditions did not provide a stable basis for participatory improvement, however, and team formation faltered in more stratified workplaces over time. We argue that team projects are most useful to managers where recent or ongoing workplace restructuring has marginalized the position of clerical staff. In the long run, quality teams prove ephemeral due to tension between their participatory ethos and the technocratic project they embody.

Keywords: diffusion, quality, teams

Organizational sociology often examines the spread of innovations across industries and business communities (see, for example, Davis 1991; Osterman 1994). These studies provide an opportunity to model the dynamics of much corporate change. What sorts of firms are early to act? How do new approaches move from company to company? How is the adoption of workplace innovations related to the firm's employment model, market strategy, task structure, and cultural orientation?

Diffusion processes occur within organizations as well. Some innovations are self-consciously transferred from one division to another, permitting a relational analysis of source and recipient (see Szulanski 1996). Others spread in an unorchestrated fashion, as managers in different units mimic and learn from each other. And in a third class of diffusion processes (including the bank studied here), innovations are formally adopted by corporate headquarters but then spread in a voluntary and emergent way across the organization. In all these cases, multiunit, multidivision organizations (Greve and Baum 2001) provide a structured field within which practices move.

Intra-organizational diffusion picks up where inter-organizational processes leave off. Studies of the spread of innovations across firms are generally unable to discriminate between more versus less symbolic initiatives, and between short-lived change efforts versus successfully institutionalized ones (Zeitl et al. 1999).

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Intra-organizational research is well suited to probe the scope and staying power of innovations, and to link their utilization to conditions within the workplace.

There is little work, however, that empirically models the spread of management practices within a firm. The diffusion of innovations within companies is rarely approached in the quantitative fashion that inter-organizational diffusion is studied (Strang and Soule 1998; but see Zander and Kogut 1995). Given the importance of what happens after corporations formally adopt new managerial practices, we think this is mainly a data problem. Comprehensive internal accountings of program activity are difficult to obtain.

This paper makes use of a unique data archive to study the spread of participatory improvement efforts within a multinational bank, here called Global Financial. We trace the formation of cross-functional process improvement (CFPI, or 'quality') teams within and across business units. These teams were the leading edge of a Six Sigma initiative that began in the first quarter of 1997 and ended in early 2000. Altogether 1,183 quality teams were formed across some 90 countries in three years, generating a substantial program history susceptible to quantitative analysis.

Approaching team formation from a diffusion perspective makes sense, given the voluntaristic structure of Six Sigma. The teams studied here were not built into fundamental organizational roles or routines, nor formed via a planned operational sequence. Instead, infrastructural support and action templates were made available to line managers throughout the organization, who decided whether quality teams would help them reach their goals. The Six Sigma program took the form of an orchestrated social movement (Strang and Jung 2005) that relied not on top-down implementation but bottom-up mimicry and feedback.

This paper focuses theoretically on the link between participatory improvement teams and the firm's employment practices. Much debate surrounding contemporary team- and quality-based innovations revolves around their relationship to job security, rewards, and opportunities for advancement (see, for example, Fantasia et al. 1988; Adler 1993; Appelbaum and Batt 1994; Marchington et al. 1994; Hodson 1996; Wilkinson et al. 1997; Edwards et al. 1998; Smith 2001). Some argue that participation flourishes where firms invest in and are committed to their workforce; only under these conditions will employees enthusiastically contribute to improvement projects. Others view managerially led participation as compatible with a 'low road' employment strategy, and as a symptom of the worker's weakened bargaining position.

This study of Global Financial exploits variation across business units to examine quality team formation. Did teams catch on where jobs were relatively secure, employees were upwardly mobile, and wages were growing? Or did CFPI projects take off where workers could not resist a management program, and where recent or ongoing restructuring made cross-functional improvement useful from a corporate perspective? Analysis of intra-organizational variation lacks the scope of research across firms, but permits finer-grained measurement of workplace conditions linked to the adoption of managerial programs.

The program studied here is of special interest because it was ultimately short-lived. While more than 1,000 team projects were begun and completed, the bank's Corporate Quality Initiative was formally concluded three years after it

began, and was generally seen within the bank as a failed campaign. We consider variations in team activity across the program's life cycle. What sorts of units terminated their quality team efforts early, and what sorts of businesses continued to pursue participatory improvement while the larger corporate program was winding down?

Global Financial's Six Sigma Initiative

Global Financial is an elite financial services firm, headquartered in New York City but with operations in some 90 countries. Like other money centers, the bank comprises multiple businesses including credit cards, foreign exchange, personalized services for the wealthy, and conventional branch banking. And, like other financial service providers, Global Financial faces great pressure to modernize and streamline its operations in a decreasingly regulated and increasingly competitive sector.

The bank's Corporate Quality Initiative (CQI) was launched in the first quarter of 1997. While preceded by a series of reengineering and quality efforts, the CQI was the bank's largest and most high-profile such program to date. The CQI was positioned by the bank's leaders as the key to becoming a global 'brand'. In an internal interview distributed to all employees, Global Financial's CEO answered the question, 'the quality initiative: why now?' by arguing:

'because we can. All the work done by Globalbankers around the world has put us in a good position to make quality an integral part of a breakout strategy. No one in the financial-services industry today comes close to delivering the quality service the customer wants. If we can assure that our customers' interactions with us will be right the first time and every time, we'll achieve incredible success.'

Global Financial's quality initiative was not a feel-good program or an exercise in industrial democracy. But the CEO contended that it would improve the quality of working life as well as the quality of work:

'The hierarchical management structure will have to give way to some collective activities that will improve our effectiveness in the marketplace. Decisions won't flow from a management level to people on the line who are expected to implement those decisions. We're telling everyone, choose a process, figure out what and where the problems are, work together to come up with solutions, and then put your solutions to work.'

Consistent with this call for volunteers, it was left to individual managers to decide whether to place important projects under the quality umbrella — a decision that involved both their own personal inclinations and their perception of the responsiveness of potential participants.

Six Sigma — the quality model adopted by Global Financial — is a variant of Total Quality Management (TQM) developed by Motorola. It combines systematic measurement of organizational defects with a focus on customer satisfaction and reliance on cross-functional teams. The bank's initiative centered on individual quality training, consumer satisfaction metrics, and off-line process improvement. In doing so, the program lay well within the mainstream of the contemporary quality movement (Hackman and Wageman 1995; Cole 1999). Six Sigma was at a take-off point during the study period, and became enormously popular over the following

decade. (Indeed, a Motorola executive predicted this boom in popularity in an interview with the first author, citing the powerful demonstration effect that adoption of Six Sigma by General Electric and Global Financial would have on the business community.) The bank enacted a strong form of the approach by engaging a Motorola executive to help coordinate the program, hiring ex-Motorola staff as consultants, and licensing Motorola's proprietary training materials.

When the CQI was first rolled out, some Globalbankers complained of the difficulty of applying Six Sigma to financial services. One trader told us:

'I think manufacturing and services work very differently. Manufacturing seeks the elimination of variability. But on the trading floor, the key is to capitalize on anomalies in the market, not suppress them. Also, our jobs are very personal in nature, where you have to adapt to customer needs.'

In response, the Corporate Quality Office modified the approach to bring it closer to the needs of a service business, pairing Six Sigma's emphasis on systematic measurement with a behavioral approach centered on teamwork and change management.

CFPI projects were organized by line managers to address 'critical business issues'. Teams sought to reduce clerical errors, accelerate responses to consumer inquiries, and coordinate the services of the bank's many businesses. Quality teams increased check processing capacity in Egypt, designed protocols for cross-selling financial products in Argentina, and reduced the frequency of incorrectly reported account balances in Singapore.

The internal workings of quality teams diverged from standard practice at Global Financial. While the bank was known for its competitive culture (some said 'cut-throat competition'), Six Sigma proposed an ethos of cooperation. CFPI teams combined the talents of employees with differing expertise in an environment that minimized formal acknowledgement of rank. Several program advocates told us that the real payoff would be to help Globalbankers learn to work together in new ways.

Quality teams challenged the status quo substantively as well as procedurally. CFPI teams aimed not only to develop plans for organizational change, but to implement them against the potential resistance of existing process owners. Our observation of teams highlighted the politics of organizational change, as teams struggled to find a niche within the bank's power structure.

CFPI teams have much in common with other types of teams. Like self-directed work groups, they are formally autonomous and push responsibility down the organizational hierarchy. In concert with other visions of team-based organization, they represent a shift towards a flexible task-based architecture. And, like all teams, they embody the dynamics of commitment and cooperation in a small group setting.

But as Denison et al. (1996) note in an insightful discussion, CFPI teams are a distinctive sort of team. Their members are drawn from various functional backgrounds and organizational locations, and continue to perform their regular duties while contributing to the group effort. Although quality teams form a system of collective endeavor that stands outside the firm's conventional authority structure, they do not embody a new way of performing organizational tasks. They are instead 'off line' vehicles for redesigning those tasks.

Theoretical Arguments and Research Questions

The debate surrounding contemporary workplace innovation is often unwieldy due to the multiplicity of overlapping forms of workplace change. Labels like Six Sigma and TQM are notoriously unstable, and each organization's 'quality journey' involves extensive experimentation and recombination. As a result, 'flexible', 'transformed', or 'high performance' practices have unclear scope and content.

We conceptualize the organizational program studied here within the rubric of 'participatory improvement'. The virtue of this term is that it identifies quality teams with both their ends and their means. The primary goal of Global Financial's quality initiative and its CFPI projects was operational improvement, ultimately in aid of the firm's bottom-line. This goal was to be accomplished, however, through collective problem-solving that relied on the uncommanded contributions of participants, and limited the role of formal positions, incentives, and sanctions.

Main lines of argument diverge in their interpretation of this juxtaposition of participatory means and corporate ends. Does effective teamwork depend on a solid foundation of mutual gains? Or is this mutuality illusory, with participatory improvement associated with organizational restructuring and deteriorating employment conditions?

Employee Buy-in and the 'High Commitment' Employment Model

Quality teams mobilize employees outside the conventional structure of individual responsibilities and reporting requirements. They form a parallel structure that differs from the one inscribed in the organization chart, and are promoted via an intra-corporate campaign that takes the form of a social movement (Strang and Jung 2005). Success depends upon the willingness and capacity of the organization's members to make contributions that are not directly rewarded, though managers and workers may anticipate that their efforts will be recognized in the long run.

If we approach quality teams from a recruiting perspective, the key problem is 'employee buy-in'. Why would potential participants actively contribute to CFPI projects that are disconnected from individual compensation and advancement? Under what conditions will managers have sufficient faith that contributions will be forthcoming that they choose to handle difficult problems by forming quality teams?

Many perspectives on organizational behavior, from psychological theories of commitment to the historical and comparative study of industrial relations, suggest that large-scale participation requires a quid pro quo. Employees will contribute the needed ideas and energy when the firm makes a parallel investment in them. Participatory improvement schemes, in this view, are most active and fruitful when the firm adopts a 'high commitment' employment model (Kochan and Osterman 1994).

Job security is generally seen as the structural basis of successful participatory schemes. Paul Adler (1993) argues that NUMMI's promise of no layoffs was

fundamental to autoworker acceptance and full-fledged participation in process improvement. Hunter et al. (2002) find that, while workers generally hold favorable views of team-based production, support deteriorates when programs are linked to the threat of a plant shutdown. All this is consistent with Deming's insistence that management 'drive out fear'.

Favorable employment conditions can complement job security, and may substitute for it. High and rising wages support individual commitment to the firm. Job mobility leads to commitment as well, and may reduce occupational and status conflict within the firm — much as inter-generational mobility diminishes class consciousness. Employment growth provides opportunities for advancement. And limited inequality in organizational rewards should strengthen group cohesion and promote a vision of the firm as a community. In the contemporary business environment, where job insecurity is rampant, career opportunities provide an alternative basis for participatory improvement and employee buy-in.

The strongest empirical warrant for these lines of argument comes from Japan. Students of the postwar Japanese firm emphasize its distinctive employment practices: lifetime employment, extensive lateral mobility, and modest inequality within and across ranks (Dore 1973; Lincoln and Kalleberg 1990). Reinforced by cultural understandings of the firm as a community and company–union cooperation, these practices appear intimately linked to the rich array of autonomous quality programs that have flourished and been institutionalized within Japanese firms, and of which Global Financial's quality initiative was a lineal descendant.

Research within the human resources perspective on American management develops related evidence. MacDuffie (1995) emphasizes the value of self-consistent HR bundles, showing that teamwork and employee suggestion systems are most effective when combined with extensive on-the-job training, low management/worker status barriers, and the like. Ichniowski et al. (1997) points to the empirical co-occurrence and productivity benefits of teamwork, employment security, job rotation, and intensive recruitment and training.

Managerial Buy-in and Organizational Restructuring

Quality programs seek operational improvement: reduced errors, shortened task times, more seamless coordination. Teams are also formed by managers, not workers. Rather than focusing on the employee's willingness to contribute, an alternative starting point is to consider what managers gain from quality teams, and in what contexts they perceive participatory improvement to be an effective vehicle that promotes the workplace changes they desire.

Parker and Slaughter (1993) view TQM as management by stress. They argue that teams provide rhetorical window-dressing that disguises the tough realities of an 'improved' workplace — reductions in force, increased automation, and product-line speedup. Graham's (1995) ethnographic study of teamwork in a Japanese transplant finds little empowerment but great pressure to get the work out. Bonazzi (1995) argues that popular and scholarly discussions of the Japanese model unduly stress its communal vision of industrial relations, while underestimating its 'production side tightness'.

Within financial services, production-side tightness involves efforts to simplify and accelerate task processes, and cut labor costs. This occurs at the consumer interface, with ATMs and online transactions replacing much traditional branch banking. Restructuring also occurs internally, as check imaging, automated data processing, and other technological innovations lead to the centralization of high-volume, standardized tasks. As Baethge et al. (1999: 11) describe:

'Rather than having branch employees perform a range of processing tasks through the day, processing work could be centralized in large offices, with all the advantages of high throughput and specialization — and all the liabilities of Taylorized production regimes.'

The modern quality movement is a movement of professionals and experts (Cole 1999; Vallas 1999) that is well positioned to contribute to organizational restructuring. Its ideals are those of the engineer (Shenhav 1999): efficiency, systematic learning, and 'management by fact'. And quality control problem-solving techniques are most relevant to the standardization of high-volume, routine tasks; it is here that Six Sigma's notion of a .0000034 defect rate becomes discussable. The process improvement goals of quality teams are hard to distinguish from those of minimally participatory approaches like business process reengineering, and, in fact, the quality and reengineering movements are on a path toward convergence (Jung 2005).

From a managerial perspective, quality teams are most obviously useful where workplace restructuring, downsizing, and automation have already occurred or are ongoing. The aims of cross-functional improvement — process simplification, error reduction, and cycle time acceleration — are of critical significance where businesses must perform the same amount of work with fewer employees, and most profitable when headcount can be reduced. Prechel (1994) shows that TQM supported centralization and delayering in a steel corporation. Osterman (2000) found that adopters of TQM and teams had higher rates of lay-offs than did firms without such programs.

Participatory improvement may also play an important legitimating function. Quality management utilizes a technically neutral language of efficiency and error reduction that shifts attention away from organizational winners and losers, while the notion of a 'team' calls forth images of joint effort and camaraderie. Quality initiatives may coopt those who would otherwise oppose change. As Osterman (2000) suggests, one explanation for the persistence of team-based programs in an era of downsizing is that participation is its own reward.

Employee resistance may also be undercut by employment insecurity and a lack of bargaining power. Repenning's (2000) analysis of participation argues that fear of job loss will drive workers to contribute to organizational improvement efforts unless they can act collectively. And, in an incisive historical analysis, Drago (1997) ascribes the contemporary era of employee involvement to a 'managerial offensive' grounded in a shifting industrial power balance. As outsourcing has made workers and workplaces increasingly vulnerable, the limits that organized labor once placed on management-led participation have eroded.

In sum, compelling but opposed arguments can be made about the origins and structural supports of participatory improvement. Human resource management views teams from the standpoint of employees who participate in them, and asks about the employment conditions that would support their wholehearted

involvement. Critical analyses of organizational behavior approach teams from the standpoint of managers who form them, and take a dim view of the likely convergence of organizational and employee interests. The contrast between these perspectives defines the core empirical question pursued in this study:

How are employment practices within business units related to the formation of quality teams?

While the above discussion frames the general relationship between employment practices and participatory improvement, two distinctions provide a closer specification. The first involves variation across types of employees, and the second variation over time.

Quality was defined as 'everyone's business' at Global Financial. The program was designed to provide all employees with individual quality training, and everyone from the Chairman on down was supposed to respond proactively. But, despite the construction of Six Sigma as a collective endeavor, motives and conditions of participation may have depended on one's position at the bank.

Most analyses of employee participation focus on the front-line worker. Her morale and commitment to the firm appears problematic, while that of managerial and professional employees is taken for granted. (At Global Financial, 'her' is empirically appropriate — 76% of clerical staff were female, while 59% of managers, professionals, and technical personnel were male). The modern quality movement celebrates the insights of those 'closest to the work' while saying less about the contributions of specialists and technical experts. If front-line workers demand a quid pro quo while those higher up the organizational ladder already have one, quality teams should be most influenced by the structural position and opportunities of pink collar employees.

In the contemporary business environment, however, the position of managers and professionals no longer seems so secure. Middle managers are the targets as well as the carriers of many organizational change efforts (Smith 1990). Delaying and downsizing have thinned their ranks, and diminished the gap between the employment security of white collar workers and the insecurity of those they supervise. Middle managers are often seen as resisting participatory practices that imperil their status and authority.

At Global Financial, a wide range of employees were involved in CFPI teams. A random sample of US Globalbankers ($N = 245$) showed that 37% of managers, 23% of supervisors, 21% of professionals, and 15% of clerical staff had participated on at least one quality team. Adjusting for the bank's occupational distribution, this implies that the average team was composed of 20% managers, 21% supervisors, 28% professionals, and 31% clerical staff. When managers formed teams, they necessarily considered the potential reactions of a wide range of Globalbankers who would be enlisted. We thus want to attend to the *type* of employees experiencing wage gains, layoffs, and the like, with a focus on the pink collar–white collar divide.

A second dimension that adds complexity is time. Participatory improvement does not involve a single decision that is made and then implemented. Instead, quality teams are formed in an evolving temporal sequence. Some business units

that respond quickly to a headquarters initiative may fail to create a consistent pattern of activity, and some late risers may pursue CFPI projects even while the larger corporate program is winding down.

The relationship between employment conditions and the trajectory of the quality program is thus of great interest. The human resource tradition is most fairly read as arguing that, while any kind of organization can start a participatory program, institutionalization requires the right kind of employment practices. Marxist analysts like Ramsay (1977) argue that the objective reality of class conflict dooms participatory schemes quite generally — wage gains, upward mobility, and even job security are not enough to align the interests of workers and the firm. In the case of Global Financial, we want to link employment practices, not only to the amount of quality team activity, but to its sustainability over time.

Data and Methods

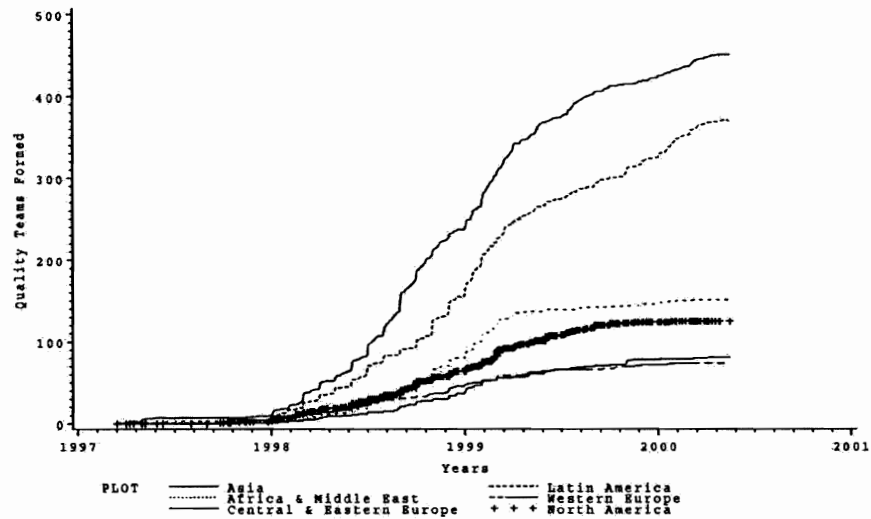
Global Financial's Corporate Quality Office maintained an extensive database on cross-functional process improvement projects. Archival records chart the sequence of each team's activities: the timing of standard 'milestone' meetings (such as when the team moved from analysis of current practice to recommendations for change, and from planning to implementation), and the date when the project was completed. Here we focus on team formation, dated to the first meeting of each new team.

Our analysis begins on 1 January 1997, the quarter when Global Financial's corporate quality initiative was officially launched. It ends on 15 May, 2000, the last date covered in the bank's CFPI archives. While the quality initiative formally continued for some months after this date, the program was winding down well before our last observations. The observation period thus captures the broad history of Global Financial's Six Sigma initiative.

The units at risk of forming quality teams are business divisions operating within countries. The bank's three major divisions are differentiated by their customer base: the Consumer Bank (which provides services to individuals), the Corporate Bank (which provides services to corporations), and the Private Bank (which provides services to wealthy individuals). Within the US, where about half of all employees work, we identify a more fine-grained set of 10 businesses (distinguishing, for example, branch banking and consumer loans). In addition, a set of Technical Support divisions served internal customers: these include the Computer Infrastructure Group, Electronic Banking, and Human Resources. Attention is restricted to organizational units with at least 50 employees, since tiny departments were too small to develop independent CFPI activities.

In total, 1,183 quality teams were formed at Global Financial over the observation period. Full data was available for 1,069, and it is these that are studied here (of the teams not studied in multivariate analyses, 65 involved units with fewer than 50 employees while others were missing data on model covariates). The first team was set up on 15 March 1997 by Colombia's Consumer Bank to expedite auto loans, and the last on 26 April 2000 to improve the customer database of Venezuela's Corporate Bank.

Figure 1
Quality Team
Formation by
Region



Modeling Framework

Team formation is treated here as a renewal process occurring within business units, where the quantity of interest is the waiting time between successive team starts (time since the beginning of the Quality Initiative, for the first team in each unit). The regression-like framework of event history analysis is well suited to link team formation to adopter characteristics.

The major methodological issue, as in most event history studies, is time dependence. Figure 1 tracks the number of new teams at Global Financial over the history of the initiative, which follows a sigmoid curve. Low levels of initial CFPI activity were followed by a burst of team formation, and subsequently by a sharp decline in new starts.

The acceleration in team formation during the first two years of the quality initiative suggests contagion and reinforcement. At the program's outset, most managers knew little about Six Sigma and team-based process improvement. As teams were formed and completed their projects, this uncertainty diminished. Managers learned from their own experience and from that of others, developing a more concrete sense of the problems that quality teams could solve, and rates of team formation expanded.

Starting in early 1999, however, the overall rate of quality team formation began to decline. Some businesses may have already picked the 'low hanging fruit' and decided that further projects would garner diminishing returns, while others may have found CFPI projects did not deliver the promised benefits, or generated more problems than they solved. And, across the bank as a whole, exogenous shifts in the bank's leadership led to a waning sense that the Corporate Quality Initiative was 'what the chairman wants'.

Analyses adjust for this trajectory via Cox's partial likelihood method for proportional hazards, which eliminates common temporal variation. Since time is measured historically, this controls for the overall tendency of business units to first expand and then contract their quality team activities. Measures of contagion/reinforcement are utilized to model endogenous dynamics at the level of business units.

Table 1. Measures of Employment Conditions in Global Financial's Businesses, 1997–2000

	Mean	SD
Wage Inequality	0.851	0.403
Managers & Professionals	0.694	0.363
Clerical Staff	0.505	0.312
Managers & Professionals vs Clerical Staff	2.613	1.041
Wage Growth	-0.007	0.212
Managers & Professionals	-0.001	0.242
Clerical Staff	-0.010	0.203
Layoffs	0.032	0.057
Managers & Professionals	0.028	0.055
Clerical Staff	0.038	0.076
Job Mobility	0.145	0.089
Managers & Professionals	0.185	0.131
Clerical Staff	0.099	0.115
From Clerical to Managerial/ Professional Positions	0.013	0.034
Employment Growth	0.156	0.412
Managers & Professionals	0.157	0.491
Clerical Staff	0.212	0.728
Employment (total)	680.842	1429.76
N of Teams within Business (<i>t</i> -1)	5.860	7.396
N of Teams in Neighboring Countries (<i>t</i> -1)	9.130	14.436

Organizational Covariates

Measures of employment conditions within business units are drawn from Global Financial's personnel records. All measures are lagged one year to avoid confusing the causes of team formation with its effects. They include:

Wage growth: proportional change in average wages within the business unit.

Layoffs: proportion of employees who were involuntarily terminated during the previous year.

Job mobility: proportion of employees who moved up within the bank's 34-level occupational classification scheme during the previous year.

Wage inequality: coefficient of variation of annual wages (standard deviation divided by the mean).

Employment growth/decline: annual hires minus terminations, divided by total employment at the beginning of the year.

To construct measures for subgroups, we utilize the bank's categorization of all employees into officers or staff. The former, who we describe as managers and professionals, include those with administrative responsibilities and those whose work requires advanced knowledge, such as marketing specialists, software engineers, and credit management analysts. Clerical staff include employees such as customer service representatives, clerks, tellers, data processors, and workflow coordinators. We calculate contrasts between the two groups where appropriate, such as the rate of mobility from staff to officer positions.

Table 2. Coefficients from Partial Likelihood Analyses of Quality Team Formation at Global Financial, 1997–2000

Variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Employment (log)	.394*** (.040)	.400*** (.041)	.393*** (.040)	.394 *** (.040)	.396*** (.039)	.390*** (.040)	.406 *** (.041)
Corporate Bank	.020 (.078)	.020 (.078)	.023 (.079)	.021 (.079)	.051 (.080)	.020 (.079)	.051 (.081)
Private Bank	-1.095*** (.253)	-1.090*** (.253)	-1.086*** (.254)	-1.093*** (.254)	-1.084*** (.253)	-1.100*** (.253)	-1.075*** (.255)
Technical Support Divisions	-.678* (.291)	-.674* (.291)	-.669* (.291)	-.673* (.292)	-.678* (.291)	-.698* (.292)	-.687* (.294)
Africa	.778*** (.181)	.827*** (.199)	.778*** (.181)	.784*** (.185)	.739*** (.182)	.772*** (.181)	.834*** (.200)
Central & Eastern Europe	.869*** (.204)	.897*** (.210)	.864*** (.201)	.875*** (.208)	.979*** (.206)	.888*** (.206)	1.038*** (.214)
Western Europe	-.420* (.187)	-.418* (.187)	-.430* (.189)	-.413* (.192)	-.472* (.188)	-.409* (.187)	-.485* (.194)
Asia	.880*** (.145)	.896*** (.148)	.867*** (.148)	.886*** (.151)	.911*** (.146)	.886*** (.145)	.929*** (.155)
Latin America	.844*** (.149)	.870*** (.156)	.846*** (.150)	.850*** (.154)	.819*** (.150)	.848*** (.150)	.866*** (.158)
N of Teams within business (<i>t</i> -1)	.038*** (.004)	.038*** (.004)	.038*** (.005)	.038*** (.004)	.038*** (.005)	.038*** (.004)	.039*** (.005)
N of Teams in neighboring countries (<i>t</i> -1)	.006** (.002)	.007** (.002)	.006** (.002)	.006** (.002)	.006* (.002)	.006** (.002)	.006* (.002)
Wage Inequality		-.055 (.095)					-.135 (.095)
Wage Growth			-.073 (.172)				-.053 (.174)
Layoffs				.111 (.711)			-.311 (.728)
Job Mobility					-1.133** (.395)		-1.212** (.411)
Employment Growth						-.119 (.148)	-.037 (.152)
Δ Log Likelihood	9517.41	.38	.18	.02	8.44**	1.69	11.72*

*** $p < .001$; ** $p < .01$; * $p < .05$

All models also include organizational size (log employment within the business), and indicators for business division and global region. We develop two measures that capture endogenous reinforcement and contagion: prior team starts within the business, and prior starts in the same division in neighboring countries. Table 1 gives means and standard deviations for all variables.

Results

Table 2 gives partial likelihood estimates of the relationship between business unit characteristics and the rate of quality team formation between 1997 and 2000. Model 0 includes size, division, region, and reinforcement/contagion effects, to which models 1–5 add measures of employment conditions. Model 6 examines the effects of all covariates simultaneously.

The employment conditions experienced by the bank's workforce as a whole were weakly related to quality team formation at Global Financial. Layoffs, wage growth, wage inequality, and employment growth/decline all have negligible and statistically non-significant effects on the rate at which teams were formed. The only statistically significant relationship is a surprising negative effect of upward mobility.

Rates of team formation varied substantially with business division and global region, and via reinforcement/contagion within and across business units. We describe these relationships briefly before turning to models that contrast the situations of clerical workers with those of managers and professionals (see Strang 2003 for a more detailed analysis of functional and geographic effects).

Variation in team formation across business divisions suggests technical contingency. CFPI projects seek to systematize work processes and improve the operational and information technologies on which they depend. They are well suited to high-volume, routine-task environments like the Consumer Bank's call centers and credit card processing operations. They are less appropriate when work is complexly relational (as in the Private Bank, which serves the needs of high net worth clients) or exploratory (as in Global Financial's Electronic Banking division). Indeed, the e-banking unit, which was largely a research and development operation, stood out in not forming a single quality team.

Regional differentials were even larger. Businesses in Asia were the quickest to form quality teams (controlling for size and division), doing so at a rate 2.4 ($= \exp[.88]$) times faster than North America. Divisions in Central and Eastern Europe, Latin America, and Africa and the Middle East were not far behind Asia, while only western Europe lagged North America. The geographic pattern seems explicable in terms of a combination of cultural and strategic factors: teams are formed more rapidly where they resonate with themes of small-group cooperation and where emerging markets create rich opportunities for corporate improvement.

Table 2 also indicates a substantial role for reinforcement and contagion. Intra-unit effects are particularly strong. For example, the business that formed the largest number of teams (Singapore's Consumer Bank) had an estimated end-of-period formation rate that was some 7.2 ($= \exp[.038 * 52]$) times greater than the one it enjoyed at program rollout. And even the median business shows a program end versus rollout differential of 135%. The formation of teams in neighboring countries also has a statistically significant effect, though about one-sixth as large.

Table 3 reports analyses that distinguish between the situation of white collar and pink collar workers. These bring a sharper picture into focus. Quality team formation was strongly related to the employment conditions experienced by managers and professionals, and also to those experienced by clerical staff. But these effects point in opposite directions.

Disaggregated measures of income inequality emphasize the gulf separating managers, professionals, and technical specialists from clerical staff. Inequality within each group was negatively related to quality team formation,

Table 3. Coefficients from Partial Likelihood Analyses of Quality Team Formation at Global Financial, 1997–2000, Disaggregated Measures of Employment Conditions

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Wage Inequality						
Managers & Professionals	-.137 (.113)					-.098 (.115)
Clerical Staff	-.143 (.117)					-.214 (.122)
M/P vs Clerical Component	.085* (.037)					.093* (.039)
Wage Growth						
Managers & Professionals		.303 (.190)				.442* (.197)
Clerical Staff		-.505* (.248)				-.654* (.270)
Layoffs						
Managers & Professionals			1.058 (1.051)			1.371 (1.094)
Clerical Staff			-.668 (.934)			-1.181 (.929)
Job Mobility						
Managers & Professionals				-.574* (.288)		-.669* (.297)
Clerical Staff				-.365 (.289)		-.208 (.310)
From Clerical to M/P Positions				-3.283* (1.634)		-3.151* (1.614)
Employment Growth						
Managers & Professionals					.410** (.137)	.482*** (.141)
Clerical Staff					-.313** (.100)	-.317** (.107)
Δ Log Likelihood vs Model 0, Table 2.	7.04	4.38	0.99	13.06**	12.44**	41.29***

*** $p < .001$; ** $p < .01$; * $p < .05$

All models control for organizational size, division, region, and reinforcement/contagion.

as arguments about social cohesion suggest (though these effects are modest and not statistically significant). By contrast, income inequality between the two groups was strongly and positively related to team formation. Businesses were quicker to form quality teams when the wage gap between managers and professionals versus clerical workers was especially large.

Job mobility tells a similar story. Upward mobility of all sorts of employees was negatively related to the formation of quality teams (this is the one case where unfavorable outcomes for bank officers are linked to high levels of CFPI activity). But the really substantial effect — almost six times larger in magnitude — involves immobility across the clerical–managerial divide. Quality teams were formed most rapidly in businesses where clerical workers hardly ever moved into supervisory or technical positions.

The relationship between wage growth and team formation differs across the two occupational groups. Quality teams were formed more rapidly in businesses where managers and professionals had experienced large wage gains (this effect is not statistically significant in Model 3, though it is when we examine all

employment conditions simultaneously in Model 6). Income growth among clerical workers had the opposite effect. Teams were more likely to be formed in businesses where clerical wages were stagnant or increasing slowly.

The changing size of the two occupational components was also related to team formation. Increases in clerical employment slowed the rate of team formation, while increases in the managerial and professional component accelerated it. Since the bank experienced modest growth over the period studied here, these effects reflect shifts in occupational composition rather than radical downsizing. Where the relative size of the clerical component was declining, we see much CFPI activity; where it was increasing, few teams were formed.

Model 6 shows that the employment conditions examined here hold simultaneously. The rate of quality team formation was accelerated by wage growth among officers and employment growth among officers. It was slowed by wage growth among staff, high job mobility among officers, high job mobility from staff to officer positions, and substantial employment growth among staff. Only one measure — layoffs — bears no relationship to team formation, perhaps due to measurement problems (voluntary and involuntary moves are not easily distinguished). These effects are robust to model specification, and produce jointly significant increments to model fit.

The substantive implications of Table 3 are clear. The employment conditions associated with quality team activity at Global Financial offer little in the way of a quid pro quo, at least as far as tellers, customer service representatives, and others making up the bank's front-line workforce are concerned. Quality teams flourished in businesses where clerical workers formed a shrinking fraction of bank employment, where they received low wages relative to those above them in the organization's hierarchy, where they experienced weak wage growth, and where they were least likely to rise into supervisory or technical roles.

The empirics of quality team formation were only compatible with a high commitment model where managers and professionals are concerned. Wage and employment growth may have given managers and professionals confidence that their status would not be undermined by quality teams, or led them to respond enthusiastically to the opportunity to participate. Indeed, observation of CFPI training sessions made it clear that professional and managerial workers, like their counterparts on the front-line, were ambivalent about a program that might turn out to be 'the flavor of the month'. They demanded proper recognition and a reasonable level of autonomy before they would commit themselves to a team effort.

Why might arguments about employee buy-in apply to white collar but not pink collar workers? We suspect that managers and professionals were the key technical contributors to quality teams. While the quality movement celebrates the know-how of those closest to the work, actual CFPI projects relied heavily on technological fixes to automate and accelerate work processes. For this reason, and by virtue of their higher status within the bank, managers and professionals were better positioned to demand and receive a quid pro quo than clerical workers were. Phone representatives

Table 4. Coefficients from a Model of Quality Team Formation where Employment Conditions Interact with Reinforcement Effects, Global Financial 1997–2000

	Main effect	Interaction with number of teams previously formed in business
N of Teams within unit (<i>t</i> -1)	.074** (.026)	
N of Teams in neighboring countries (<i>t</i> -1)	.006* (.003)	
Wage Inequality		
Managers & Professionals	-.205 (.170)	-.002 (.013)
Clerical Staff	-.413* (.162)	.040* (.020)
M/P vs Clerical Staff	.225*** (.060)	-.013* (.006)
Wage Growth		
Managers & Professionals	.883** (.297)	-.045 (.028)
Clerical Staff	-1.368*** (.369)	.101** (.034)
Layoffs		
Managers & Professionals	.963 (1.694)	.071 (.169)
Clerical Staff	-1.278 (1.319)	-.048 (.122)
Job Mobility		
Managers & Professionals	-.380 (.387)	-.050 (.047)
Clerical Staff	.118 (.422)	-.054 (.054)
Clerical to M/P Positions	-5.488* (2.163)	.773** (.288)
Employment Growth		
Managers & Professionals	.408* (.173)	.010 (.031)
Clerical Staff	-.221 (.129)	-.024 (.022)

*** $p < .001$; ** $p < .01$; * $p < .05$

Model also controls for organizational size, division, and region.

may have had little opportunity to decline to participate, while middle managers and technical experts enjoyed a wider zone of non-compliance. Employee buy-in cannot explain the full range of findings in Table 3 — most particularly, why there is a negative and not just a null relationship between the position of clerical staff and quality team formation — but it does help us understand the conditions under which white collar staff were 'on board' with participatory improvement.

Temporal Shifts in Quality Team Formation

The above analyses develop a largely static portrait of the effects of employment practices on quality team formation. Tables 2 and 3 allow estimated rates of team formation to shift as employment conditions change, via reinforcement/contagion and through common temporal variation, but treat covariate effects as stable. To examine shifts in causal determinants, Table 4 reports a model of team formation that adds interactions between each employment condition and the number of teams previously formed within the unit.

Four employment conditions have effects that varied with the business unit's CFPI experience. The negative impact of clerical wage growth eroded at high levels of team activity, as did that of immobility across the pink collar–white collar divide. The positive effect of income disparity between the two occupational groups fell with quality team experience, as did the impact of income inequality within the clerical workforce.

One way to evaluate the magnitude of these temporal shifts is to consider the point at which they offset initial disparities. By this metric, the largest shift is in immobility between staff and officer positions, where an initially strong negative effect reaches zero after seven teams have been formed ($= 5.488/.773$), and turns positive thereafter. Since the median number of teams formed per business unit was nine, a majority of the bank's country divisions experienced a sign switch in the initially team-enhancing effect of clerical immobility. The negative effects of clerical wage growth becomes positive when businesses form more than 13 teams, while the positive effect of pink collar–white collar wage inequalities turns negative once 17 teams are formed.

Overall, the positive relationship between workplace stratification and team formation thus weakened over the course of the bank's initiative. Businesses where workers received low wages and seldom moved into supervisory or technical positions jumped quickly onto the quality bandwagon, and formed relatively large numbers of teams over the life cycle of the corporate initiative. But these were not settings where participatory improvement was most effectively sustained over time. While rates of CFPI team formation were declining at Global Financial as a whole in the last year of the quality initiative, they declined most rapidly in more stratified workplaces.

Why were early risers not also late abandoners? We suggest that quality teams have short-run benefits in highly stratified businesses, but longer-term costs. In the short run, quality teams may have identified operational improvements that address staffing problems or assist in organizational restructuring. In the long run, high levels of income inequality and occupational immobility undercut the ideology of collective commitment that is central to a quality initiative, and made face-to-face teamwork across occupational positions increasingly problematic.

By contrast, the positive effects of managerial/professional wage and employment growth did not diminish over time. Here, a fast start was not combined with a later collapse in quality team activity. Businesses where managerial and professional opportunities were growing fastest continued to pursue team-based process improvement actively even after headquarters support for the program began to erode.

Discussion

Employment conditions were strongly related to quality team formation at Global Financial — but only when we distinguish the situations of pink and white collar workers. Rates of team formation were high when pink collar workers received low wages relative to managerial and professional workers, experienced weak wage growth, were less likely to rise into supervisory positions, and formed a shrinking proportion of bank employment. By contrast, team activity was positively related to wage gains and employment growth among managers and professionals.

These relationships make sense within a perspective on participatory improvement that stresses its connection to workplace restructuring. Substantial opportunities for quality team interventions arise where the role of clerical labor is diminishing (thus low wage gains and declining employment levels) and where

Table 5. Accomplishments of 17 Award-winning CFPI Teams at Global Financial, 1999

<i>Impact Type</i>	<i>Frequency</i>	<i>Example</i>
<i>Speed of Operations</i>	13	Not solved in one day inquiries down 62%
<i>Customer Satisfaction</i>	7	Customer complaints drop
<i>Reduced Errors</i>	6	33,000 fewer customers experience ATM problems
<i>Process Simplification</i>	6	Percent of contracts needing manual intervention down to 15% from 50%
<i>Employee Satisfaction</i>	3	Increased employee satisfaction
<i>Productivity</i>	2	Representatives call productivity up 45%
<i>Revenue</i>	2	Foreign exchange sales revenue up 25%

clerical tasks are most distinct from professional and supervisory work (thus high wage differentials and immobility across the pink collar–white collar divide). CFPI teams were well equipped to push forward the routinization and automation of everyday clerical tasks.

Examination of quality team achievements lends support to this interpretation. While systematic data across the bank is not available, Table 5 describes the outputs of 17 CFPI teams that were honored at Global Financial in 1999. These award winners exemplify the outcomes that senior managers and quality professionals saw as most worthy of recognition, and which they hoped other teams would be inspired by.

Award-winning teams accelerated banking operations and increased their efficiency. Thirteen of 17 were described as ‘improving cycle times’ (to use Six Sigma’s vocabulary). Teams discovered ways to reduce the number of customer inquiries that remained unresolved after one business day; accelerate the speed of fund transfers; cut the time taken to make funds available; and deliver contracts more rapidly. Greater customer satisfaction, reduced organizational errors, and simplified work processes were also central CFPI achievements. Teams implemented operational changes that led to reductions in complaints; retained an important at-risk client; increased the accuracy of global payments; and reduced handoffs by 90%.

By contrast, award winners had little apparent effect on the quality of working life. Two are described as increasing employee satisfaction, and one as reducing turnover. And although these CFPI projects may have improved working conditions in unrecorded ways, the fact that this aspect of team activity was seldom documented indicates that their attention and that of the bank was elsewhere.

The achievements of award-winning teams also point to the dark side of participatory improvement. The process simplifications achieved by one of the teams was described as ‘saving 34 full-time equivalent (FTE) positions’. While team records do not indicate whether these savings led to terminations, the threat was clear. Several Globalbankers told us that the relationship between the quality initiative and downsizing was often raised but never resolved at the bank.

Is this system of participatory improvement stable? The answer at Global Financial, as at many corporations, was no.

While human resource arguments about employee buy-in do not explain why quality teams initially flourished in the bank’s more stratified businesses, they help to account for the fragility of participatory improvement over time. Businesses

with large pink collar–white collar divides were quick to form teams early on, but exhibited sharp declines in team formation over time. These businesses provided fertile ground for efficiency measures, but were also settings where the voluntaristic, solidary ethos of participatory improvement was inconsistent with the employment conditions faced by many workers. Broad-based participation appears to have been hardest to sustain where claims of an underlying harmony of interest rang least true.

Problems also arose on the managerial side. Some teams dramatically reduced ‘organizational defects’ and increased ‘cycle times’. But as Sterman et al. (1997) emphasize, enhanced efficiency does not automatically translate into higher profits. To affect financial performance, organizational improvement must either generate more revenue or permit businesses to cut costs.

Neither revenue enhancement nor cost reduction was readily available on the scale of the operational achievements of the best teams. Opportunities for growth were limited since Global Financial was in a strong market position when Six Sigma was rolled out. And although managers were formally free to dismiss workers made redundant by team projects, their ability to do so was hamstrung within the interpretive frame of a participatory program where everyone should benefit. One quality professional told us that these normative constraints led to much managerial ‘push back’ against the corporate initiative.

In considering the erosion of support among both managers and workers, it is useful to recall that Global Financial’s Corporate Quality Initiative, like most innovation efforts, was first and foremost a professional project. It represented a triumph for the bank’s quality experts, who had long sought to convince senior leaders of the need to systematically improve work processes and customer interactions. As an elite-sponsored movement rather than one that emerged from the bank’s grassroots, Six Sigma lacked a core constituency among either line managers or workers. It could be readily abandoned by both groups when internal oppositions began to render participatory improvement problematic in its own right.

An alternative explanation for the demise of the Six Sigma program is that participatory improvement simply failed to produce sufficient technical benefits. But examination of corporate records suggests that many teams did achieve concrete improvements in operational efficiency and customer responsiveness. And, while astounding breakthroughs might have made the quality initiative politically untouchable, the results of a conventional cost–benefit analysis are unclear. Indeed, Globalbankers were unable to summarize the net financial impact of the Corporate Quality Initiative; the hypothetical balance sheet was too implicit and too localized to be knowable.

One might also argue that a manufacturing-based quality model was ill-suited to the needs of a service business. Some aspects of Six Sigma were indeed difficult to ‘naturalize’; we think, in particular, of efforts to formulate organization-level customer satisfaction metrics. However, the CFPI teams studied here have a more plastic character, since all organizations confront efficiency challenges that may benefit from the collective work of employees at different levels and with differing expertise. Globalbankers who advocated the quality initiative put great faith in these teams and their direct and indirect benefits.

We should note some of the limitations of this study. First, we were unable to develop measures of unionization or other features of industrial relations across the bank's many country-specific divisions. Unions are both possible partners in process improvement and potential opponents of top-down restructuring. Second, we have studied temporary teams rather than work groups that integrate collective problem-solving into their everyday tasks. It is possible that on-line teams would have been more closely tied to employee interests in job security, equality, and advancement. (We should point out, however, that most total quality initiatives are designed around off-line teams rather than autonomous work groups; our analysis speaks to the dominant form of contemporary participatory improvement.) Third, this paper has studied team formation at a single firm. Organizations vary greatly in how they approach participatory improvement (Marchington et al. 1994), and Global Financial's quality program was shaped by many organization-specific factors; it is for this reason that we have focused on relative rates of expansion and decline in team activity rather than the program's trajectory across the bank as a whole.

Indeed, efforts to typify 'innovation journeys' are risky. Much discussion of Six Sigma, TQM, reengineering, and other named management practices presumes considerable uniformity across firms. But one of the most important characteristics of these innovations is that each organization re-imagines them, and then responds to its own enactment. Vallas (2003) notes that 'workplace change is not akin to a surgical procedure under anesthesia'. A better metaphor might be of a surgeon operating on him- or herself.

While some skillful organizations may resolve the internal oppositions seen at Global Financial, much work on participatory improvement and related programs suggests that they are widespread. In a study of corporate restructuring in a California bank, for example, Smith (1990) finds that middle managers resisted demands for flexibility that they saw as rendering the firm unmanageable. Milkman's (1997) examination of autoworkers shows that computer-based technology and enhanced participation mainly benefited skilled employees. Vallas's (2003) analysis of why teams fail emphasizes oppositions between the 'logic of standardization' and the 'logic of participation'.

A final, big picture, question: if participatory improvement involves a conflict between ends and means, as we have argued, why is it so common? Our answer is that while 'mixed motive' programs of workplace change are beset by internal contradictions, they are nevertheless more viable than purely employer- or employee-centric visions. Stripped of a socially integrative participatory framework, process improvement tends to engender unambiguous resistance. One good example is reengineering, an unabashedly technocratic approach that was quickly tagged as another term for downsizing. Conversely, employee involvement programs that are disconnected from business issues have tenuous value from a managerial perspective, appeal to few workers as well, and tend to atrophy over time (Hill 1991). And, while some might contend that organizational leaders should avoid the hype entirely, a compelling interpretive frame is fundamental to the art of getting things done (Eccles and Nohria 1992).

Absent a harmony-inducing reconstitution of the modern organization, we thus anticipate that participatory improvement will continue to take the form of relatively ephemeral initiatives within firms, and of management fads and fashions

across them. These kinds of campaigns are unlikely to be extinguished – indeed, the language and cultural imagery of participatory improvement is taken for granted within the business community. But participatory improvement is more likely to remain a utopian ideal and reform movement than be institutionalized as an organizational reality.

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David Strang

David Strang is Professor of Sociology at Cornell University. His research focuses on diffusion dynamics within business and politics. Recent projects include a monograph-length analysis of imitation and innovation diffusion in a global bank's benchmarking program, and analysis of the post 9/11 spread of civil liberties resolutions across US cities. Current interests include models of managerial hiring and firing, conditions under which the domino theory does and does not apply, and the evolution of the 'article' in organizational studies.

Address: Sociology/Uris Hall, Cornell University, Ithaca NY 14853, USA.

Email: ds20@cornell.edu

Dong-II Jung

Dong-II Jung is Assistant Professor of Sociology at Hallym University in Korea. His research interests include organizational sociology, economic sociology, social movement, and statistical methods. Currently he is focusing on the social construction of organizational practices such as Total Quality Management and Reengineering. He is also conducting comparative research of the diffusion and institutionalization of social enterprises.

Email: dijung@hallym.ac.kr