

# The evolution and allocation of employee stock options: adapting US-style compensation to the Swedish business model

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## Abstract

From 1998 to 2002 the Sweden-based telecommunications equipment company, Ericsson, instituted a series of stock option plans, thus emulating a distinctly American mode of compensating high-tech personnel. Then in 2003, Ericsson did not renew its stock option program. Instead Corporate HR developed a unique employee stock purchase plan that made central use of an HR tool inherited from the 2001 and 2002 stock option plans to reward a subgroup of outstanding non-executive employees. The Ericsson experience with stock options shows that corporate HR managers can graft an alien mode of compensation onto a well-developed organizational structure without undermining the integrity of that structure. Our close examination of the transfer of US-style stock options to Ericsson shows why convergence to the latest US business model is not an inevitable outcome, and how in global competition in the ICT industries alternative business models can still result in competitive success.

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## A case study of the transnational transfer of employee stock options

From 1998 to 2002, the Sweden-based telecommunications equipment company, Ericsson, instituted a series of executive and non-executive stock option plans, thus emulating a distinctly American mode of compensating high-tech personnel (see Table 1). Then in 2003, the Ericsson Board of Directors declined to renew the company's stock option program. In its place Corporate HR developed a unique employee stock purchase plan, central to which is an HR tool, the Key Contributor (KC) program, originally conceived in conjunction with the 2001 and 2002 stock option plans to reward a subgroup of outstanding non-executive employees.

Ericsson's 5-year experiment with employee stock option plans represents an attempt by a European corporation to

adopt an organizational innovation developed abroad. Specifically, in the late 1990s the transfer to Europe of broad-based stock option plans appeared to be a prime mechanism for implanting New Economy employment relations in European industrial corporations. Our in-depth study of the diffusion of Silicon Valley-style stock options to Ericsson demonstrates, however, that Americanization of European industry has its limits. The adoption of US-style stock options did not in and of itself transform employment relations in a long-standing business corporation that, even after a century of global operations, still reflected the egalitarian Swedish business model. Indeed the Ericsson case shows how creative HR executives can transform a mode of compensation transferred from abroad to conform to, and apparently enhance the effectiveness of, an existing set of employment relations.



**Table 1** Recipients of stock options, Ericsson, 1998–2002

Plan	EE	EO	EO/EE (%)	SO (000s)	SO per EO
1998	103,667	494	0.48	3504	7093
1999	103,290	1803	1.75	2004	1111
2000	105,129	8225	7.82	71,615	8707
2001	85,198	15,607	18.32	44,889	2876
2001nov	85,198	1052	1.23	2618	2489
2002	64,621	12,754	19.74	53,877	4224

Notes: EE = Ericsson employees (year end); EO = Ericsson optionees in plan; SO = Stock options in plan.

Source: Internal Ericsson document, 'Summary – Ericsson Option Plans', March 10, 2003.

Building on our previous work on the transfer of the US 'New Economy business model' to innovative European telecommunications equipment companies in the era of the Internet (Casper and Glimstedt, 2001; Carpenter *et al.*, 2003; Glimstedt and Zander, 2003), this paper reveals the transfer process to have been one of 'selective adaptation'; strategic actors selected and transformed elements of a foreign business model rather than transfer it wholesale. Our approach also shows the important influence of the rapidly changing competitive environment of the late 1990s and early 2000s on the process of selective adaptation. In the tight labor market conditions of late 1990s, any established high-tech company that, as Ericsson did, competed for 'talent' in the US New Economy had to establish a stock option plan to attract and retain highly mobile professional, technical, and administrative personnel. In the early 2000s, however, the combination of the bursting of the Internet bubble and the emergence of large supplies of educated and experienced high-tech workers in emerging economies, especially India and China, meant that labor market conditions no longer dictated the adoption of broad-based stock option plans. Indeed, even in the US, academics who had favored the use of stock options to align the interests of employees with shareholders began to argue that it did not make economic sense for companies to give stock options to a broad base of non-executive employees (see Hall and Murphy 2003). It was in this dramatically changed economic environment of the early 2000s that Ericsson first adapted stock options to its own organizational needs before, in 2003, doing away with stock options altogether while preserving the KC program as the foundation for its new stock purchase plan.

The Ericsson experience with stock options shows that corporate HR managers can graft an alien mode of compensation onto a well-developed organizational structure without undermining the integrity of that structure. Indeed, given Ericsson's strong competitive performance in telecommunications equipment, there is reason to believe that this grafting process enhanced the company's organizational capabilities. The information and communication technology (ICT) industries are characterized by intense global competition in which many US companies still excel, and within the US economy the New Economy business model with its broad-based stock option plans still dominates (Lazonick, 2006a). The US New Economy business model has not, however, become universal. The

close examination of the transfer of stock options to Ericsson helps us to understand why convergence to the latest US business model is not an inevitable outcome, and how in global competition alternative business models can still result in competitive success.

The three sections that make up the body of this paper are, respectively, conceptual, historical, and statistical. In the next section, we consider the four functions of stock options as a mode of employee compensation, with an emphasis on the 'attraction' and 'retention' functions for managing the labor market and the 'motivation' and 'recognition' functions for managing the productive process.

The following section traces the evolution of stock options at Ericsson, and shows how over a period of just half a decade the company continuously altered its approach to stock options in response to changing labor market conditions. Specifically Ericsson's stock option plans moved flexibly from

- (a) the 1998 plan for a select group of high-level executives, comprising less than one-half of 1% of Ericsson's labor force, to
- (b) the 1999 plan aimed primarily at dealing as well with highly mobile high-level employees of New Economy firms that Ericsson had acquired in the US, and comprising <2% of the company's labor force, to
- (c) the 2000 plan that extended stock options to almost 8% of Ericsson's employees, but still with a primary focus on highly mobile US labor, to
- (d) the 2001–2002 plans that Corporate HR designed to manage the productive process rather than, given the downturn in the telecommunications industry, the labor market, and extended to 15% of Ericsson's worldwide employees, designated as KC, with the previous bias toward awarding options to US employees virtually eliminated in the 2002 plan, to
- (e) the 2003 Board decision to eschew new stock option plans, with Corporate HR substituting instead a novel stock purchase plan that made use of the KC designation that had been central to the functioning of the 2001–2002 plans.

In sum, while employee stock options were a distinctly US phenomenon, associated with the new era of interfirm labor mobility, Ericsson was able by 2001–2002 to refashion stock options as a mode of compensation to serve its own organizational needs. Subsequently, Ericsson jettisoned stock options *per se* while preserving the HR tool – the KC program – that had been used to transform its use of stock options from managing the labor market to managing the productive process.

Statistically, the subsequent section of the paper is devoted to the analysis of the rationale underlying the allocation of stock options among employees designated as KC by local managers in Sweden under the 2001 plan. Our goal is to discern the basis on which Ericsson's managers allocated stock options among employees once the company had settled on using options mainly to manage the productive process rather than to manage the labor market. Using a database of employees in Sweden who

received stock options under the main 2001 plan (there was also a supplementary 'November' plan, aimed at attracting new employees), we seek to determine the extent to which the retention, motivation, and recognition functions can explain the allocation of options across the company's option recipients.

We chose employees in Sweden in 2001 for the statistical study because by 2001 Ericsson had settled on an approach to stock options that was driven neither by executive compensation, as in the 1998 plan, nor by highly mobile US New Economy employees, as in the 1999 and 2000 plans. Instead Ericsson's attempt to make stock options consistent with Ericsson's existing structures of rewards in particular and employment relations more generally drove the design of the stock option plans of 2001–2002, which were conceived and approved together. It should be noted that the allocations in the 2001 plan were made before Ericsson began the drastic cuts to its labor force that characterized the 2001–2003 period, when Ericsson went from 105,329 employees at the end of 2000 to 51,583 employees at the end of 2003.

The last section articulates the most important lessons that the Ericsson case study provides on the transnational diffusion and adaptation of organizational methods within industry.

### Stock options as a mode of employee compensation

Stock options are granted to employees as part of compensation packages that generally include a base salary, medical, and pension benefits, as well as, in some cases, variable remuneration such as bonuses, performance awards, and restricted stock.<sup>1</sup> The employee stock option had its origins in the US in the late 1930s as a tax dodge for salaried corporate executives; they wanted a form of compensation that would be subject to the 25% capital gains tax rate rather than the 91% marginal tax rate that New Deal legislation had imposed on salaries in the highest income bracket (Lazonick, 2003). Ultimately, even with personal tax rates greatly reduced, gains from stock options became the main source of the explosion in top management pay in US corporations in the 1980s and 1990s (see Hall and Liebman, 1998; Pearl Meyer and Partners, 2001).

Both academics and journalists have focused most of their attention on the excesses of *executive* stock options. Yet the vast majority of employee stock options in the US have been issued to *non-executive* personnel as part of what have become known as 'broad-based' programs (Sabow and Milligan, 2000; Mehran and Tracy, 2001; Sesil *et al.*, 2002; Hall and Murphy, 2003, 51–53; Oyer and Schaefer 2005). This widespread use of stock options for non-executive employees originated in the 1960s when high-tech startups in the region that would soon be known as Silicon Valley began to offer options to scientists, engineers, and managerial personnel, at all levels, and not just top executives, to lure them away from employment at established companies. Subsequently these 'New Economy' companies used stock options to compete among themselves for personnel. In their early years, some Silicon Valley startups like Intel, Oracle, Sun Microsystems, and Cisco Systems granted stock options to substantial proportions of their employees, and during the 1980s and 1990s they maintained, and in some cases enlarged, their broad-based stock option programs even as they grew to employ tens of thousands of people.

Coming into the 1990s non-executive employee stock options remained predominantly a Silicon Valley phenomenon, and even in the mid-2000s they are more prevalent among high-tech companies in Silicon Valley than in any other part of the US, much less the world.<sup>2</sup>

Nevertheless, during the 1990s stock options as a form of compensation spread within the US and around the world. With the internationalization of the operations of US-based New Economy companies that had broad-based plans, stock options became more global. Then, toward the end of the decade, non-executive stock options entered many Old Economy companies, both in the US and abroad, that acquired US New Economy technology firms whose employees viewed stock options as an essential mode of compensation. In the telecommunications equipment industry, for example, companies with their origins in the late 19th century such as Lucent Technologies in the US, Nortel Networks in Canada, Alcatel in France, Ericsson in Sweden, and Nokia in Finland established non-executive stock option programs for the first time after they had acquired New Economy firms in the US (Carpenter *et al.*, 2003; Tainio and Lilja, 2003). An indication of the changing interest of the major telecommunications equipment companies in broad-based stock option plans was their participation in iQuantic's high-tech compensation surveys over the period 1996–2004, as shown in Table 2.<sup>3</sup>

Given the tight labor markets that prevailed in the late 1990s, it seemed imperative for these companies to offer stock options to attract and retain US employees at the acquired firms. In the midst of the boom, most Old Economy companies adopted an *ad hoc* approach to the granting of non-executive stock options, with option awards being driven much more by attempts to manage tight labor markets than to manage internal productive processes. Meanwhile demand for options spread within these companies. As the boom turned to bust in 2001, however, with the interfirm mobility of high-tech personnel greatly reduced, compensation executives in these companies began to rethink their non-executive stock option programs (see Carpenter *et al.*, 2003).<sup>4</sup> A movement to expense stock option grants, moreover, threatened to lower reported net earnings, with a potentially adverse impact on stock prices (see, e.g., Sahlman, 2002; Bodie *et al.*, 2003). Large shareholders and institutional investors began to question whether, given these economic and regulatory changes, there was any net benefit to be derived from awarding stock options to employees.

The questions that faced compensation executives were whether their companies should continue to have non-executive stock option plans, and if so, how option awards should be distributed, functionally, hierarchically, and geographically, throughout the company. Data made available by the iQuantic/Buck surveys enabled a company to benchmark its competitors' allocations across functional areas, hierarchical levels, and national locations in determining its own allocation of options among its employees. In general, employees in the US tended to get more options than elsewhere, and within a national location, technical employees tended to get more options than non-technical employees, while the number of options awarded tended to rise with hierarchical and salary levels.

**Table 2** Participation of major telecommunications equipment companies in iQuantic annual high-tech equity practices surveys, 1996–2004

Total no. of participants	Alcatel	Cisco Systems	Ericsson	Fujitsu	Lucent Technologies	Nokia	Nortel Networks	Tellabs
<i>US high-tech equity practices survey</i>								
1996	68	x						
1997	70				x			
1998	89		x	x				
1999	118		x		x	x	x	
2000	201	x	x	x	x	x	x	
2001	180	x	x	x	x	x	x	x
2002	188	x	x	x	x	x	x	x
2003	155	x	x	x	x	x	x	
2004	131	x	x		x	x	x	
<i>International high-tech equity practices survey</i>								
1999	16				x			
2000	32		x		x		x	
2001	38				x		x	
2002	46				x	x	x	
2003	52	x			x	x	x	
2004	131	x	x		x	x	x	

Notes: (a) On the basis of information collected from participating companies, the US high-tech equity practices surveys provide information for the entire group of participating companies, as well as by size of company and by industry, on the distribution of stock options across different types of employee by hierarchical level, broad functional area (tech, non-tech, and sales), and salary level.

(b) Of the other major telecommunications equipment companies, Marconi (GEC to December 1999), based in the UK, and Siemens, based in Germany, did not participate in any surveys. NEC Electronics, the microelectronics subsidiary of NEC, based in Japan, participated in the US high-tech equity practices survey in 1998, 1999, and 2000.

Source: iQuantic and Buck Consultants annual high-tech equity practice surveys ([https://buck.salaries.com/pls/mellonp/survey\\_frontend.loginpage](https://buck.salaries.com/pls/mellonp/survey_frontend.loginpage)).

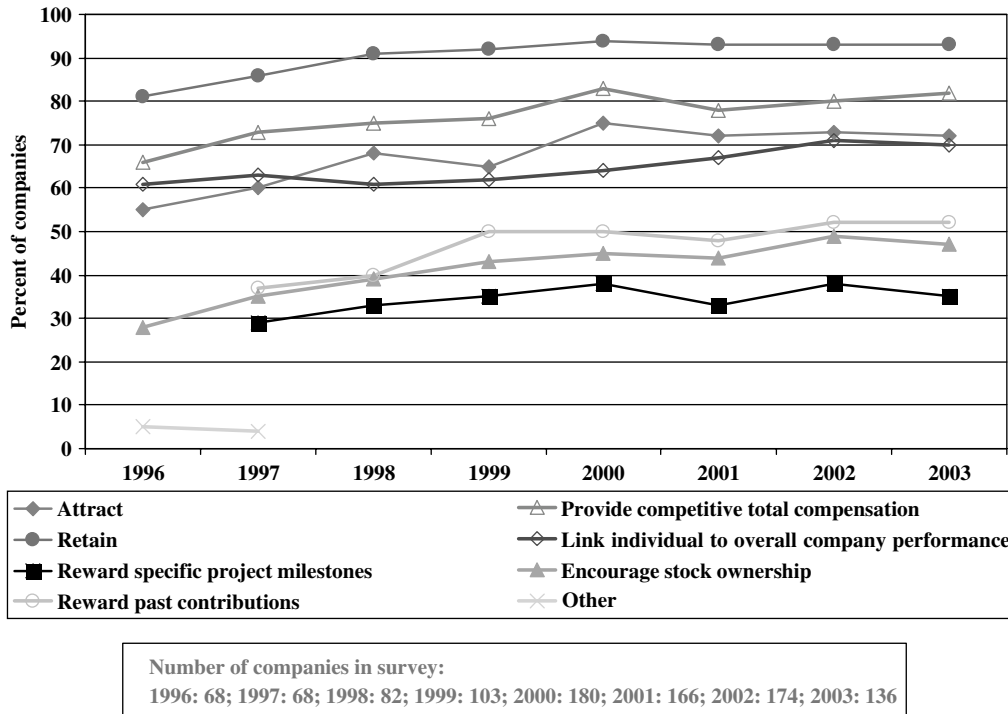
What do stock options do? In determining the distribution of stock options among employees, compensation executives can mimic their competitors, implicitly assuming that, in any location, the function of stock options is to ‘manage the labor market’ by helping to *attract* and *retain* personnel. Alternatively, or at least in addition, compensation executives can ask whether stock options have functions to perform in ‘managing the productive process’; that is, to *motivate* employees to perform better and/or to *recognize* employees’ past contributions to the firm. The structure of employee stock options plans, therefore, may reflect responses to external labor market conditions and/or initiatives to make this form of compensation serve organizational needs. An understanding of the four functions of stock options can help compensation executives decide not only how to allocate option awards among employees but also whether it is worthwhile to have a non-executive stock option plan at all.

The four functions – attract, retain, motivate, recognize – are not peculiar to stock options; any mode of compensation can potentially perform any or all of these functions. The purpose of the attraction function is to induce personnel who the company wants to employ to choose to enter into employment with the company. The purpose of the retention function is to induce existing employees to remain with the company rather than seek employment elsewhere. The purpose of the motivation function is to induce employees to expend more and better effort in engaging in work that furthers the company’s goals. The

purpose of the recognition function is to reward employees for efforts that they have already made on behalf of the company over the course of their careers, and thus to maintain the integrity, and hence the capabilities, of the business organization of which these employees have become a part.

That compensation executives in high-tech companies view non-executive stock options as capable of performing one or more of these four functions is evident in the replies that they gave when asked about the uses of stock options in iQuantic’s annual surveys from 1996 to 2003 (see Figure 1). The ‘provide competitive total compensation’ response in Figure 1 can be subsumed under either the attract or retain functions, while the ‘link individual ownership to company performance’ and the ‘encourage stock ownership’ responses, along with ‘reward specific project milestones’ response, can be subsumed under the motivation function. The ‘reward past contributions’ response represents the recognition function.

The potential benefits of the four functions of stock options will vary under different industrial, organizational, and institutional conditions. For example, the attraction function of stock options can enable highly uncertain startups to lure personnel from secure employment in established companies. The retention function of stock options can enable firms to compete with one another for ‘talent’ under tight labor market conditions. The motivation function may be most potent in startups with relatively small numbers of employees who can reap large gains from



Source: iQuantic Equity Practices Survey for the High-Technology Industries, 1996-2004.

**Figure 1** Perceptions of the functions of non-executive stock options by compensation executives in high-tech companies, 1996-2003. Source: iQuantic Equity Practices Survey for the High-Technology Industries, 1996-2004.

stock-price appreciation if and when their firm does an IPO or a private sale to another company. In contrast, the recognition function may work best in established companies that want to maintain the loyalty of long-time employees.

The functions of stock options might vary dramatically across national institutional environments, characterized by different employment relations. In the US, the indigenous home of stock option plans, the spread of non-executive stock options evolved largely as a mode of compensation for managing the external labor market, and their spread to Old Economy companies such as HP, IBM, and Lucent Technologies in the last half of the 1990s was accompanied by the decline of the expectation of employment with one company over the course of one's career (Lazonick, 2006a). In corporations such as Ericsson based in western European nations, the persistence of Old Economy employment relations would lead one to expect a greater role for stock options in managing the productive process. In either national context, we would also expect an emphasis on managing the labor market to be more pronounced in a boom period and an emphasis on managing the productive process to gain more prominence in a downturn.

In recent years, there has emerged a small academic literature on non-executive stock options that seeks to explain what functions they perform for the firm (see especially Core and Guay, 2001; Kedia and Mozumdar, 2002; Liang and Weisbenner, 2002; Sesil *et al.*, 2002; Hall and Murphy, 2003; Ittner *et al.*, 2003; Murphy, 2003; Oyer and Schaefer, 2005). The Ittner *et al.* (2003) analysis of

iQuantic data for 1998 and 1999 on the distribution of options among employees within high-tech firms suggests that option grants have a significant impact on attracting new employees, but that the size of ongoing grants do not support the retention hypothesis. Oyer and Schaefer (2005, 109-110) posit that the attraction function operates as a 'sorting' mechanism in which potential employees, who differ among themselves in their views of the prospects of any given firm, choose employers according to combinations of modes of compensation, including options, that they prefer. More optimistic employees opt for firms that include a higher proportion of options in their compensation packages.

This perspective leaves open the question of why different employers might offer different remuneration packages in which stock options are more or less prominent. Historically, in the evolution of non-executive stock options, there was a key difference in high-tech industries, especially in ICT, between, on the one side, established Old Economy companies that offered secure employment to professional, technical, and administrative employees with superior compensation taking the form of pay increases tied to promotion up the managerial hierarchy and, on the other side, startups that could not realistically hold out the expectation of employment security but could offer stock options, typically valued nominally at pennies a share. Such compensation packages became especially widespread in Silicon Valley, which in the 1980s and 1990s became the most important locale in the US, and indeed in the world, for venture-backed startups. Besides attracting talent and giving them a stake

in getting the startup to an IPO, ample stock options could substitute to some extent for cash salaries (e.g., Uchitelle 1990).<sup>5</sup> The high concentration of startups in Silicon Valley meant that increasingly in the 1980s new ventures competed among themselves to attract 'talent', with an emphasis on stock options in their compensation packages.

The growing importance of stock options in performing the attraction function placed pressure on both New Economy and Old Economy high-tech firms to look to stock options to perform a retention function. For this reason, the practice evolved in New Economy firms of making *annual* option grants, with the vesting period for any annual block of option grants being 25% of the grants at the end of each of the first 4 years after the grant date. Without creating the 'Old Economy' expectation among employees of 'lifelong careers' with the company, the perpetual existence of unvested options created a tangible retention mechanism. Indeed, the amount of options that an individual employee could expect to receive became tied to his or her position in the firm's hierarchical and functional division of labor, so that the retention function of stock options became integrally related to the employee's career progress within the business organization. Thus, a company such as Cisco Systems, which had 10 employees as a startup in 1984, and some 200 employees when it did its IPO in 1990, extended annual stock option grants on a systematic basis to virtually all its employees as its payroll touched 40,000 in 2000. The phenomenal success of a New Economy company such as Cisco in the 1990s meant that its stock price moved steadily upward, thus rendering unvested stock options an even more powerful retention mechanism.<sup>6</sup> As already mentioned, during the Internet boom of the late 1990s, with competition for high-tech labor intense, a number of Old Economy corporations such as IBM and HP adopted similar systematic broad-based stock plans to perform the retention function (Carpenter *et al.* 2003; Lazonick 2006a, b).

It is generally accepted in the literature on broad-based stock options that as a firm grows large, the effectiveness of the motivation function of stock options declines (see Sesil *et al.*, 2002; Oyer and Schaefer, 2005, 113–119). The motivation function may be most effective in a startup with a small number of employees (say 100 or fewer); the individual employee may feel that, on the one hand, his or her own application of skill and effort will affect the success or failure of the firm, while on the other hand, the gains from helping to take the new venture to an IPO or private sale to a listed company can be huge (see e.g., Mamis, 1983). Once the firm has gone public and grown larger, however, an employee is much less likely to believe that his or her individual contribution can influence the company's stock price and hence the value of stock options, especially since the stock price of a listed company will be subject to the vagaries of the stock market.<sup>7</sup>

Nevertheless stock option awards can have a motivation function even, and perhaps especially, in a large firm by signaling to the employee how the company views his or her potential performance. As already mentioned, in companies with well-established broad-based stock option plans, a promotion is typically accompanied by eligibility for more option awards on an annual basis. Stock options thus become integral to the internal system for motivating

employees to make more and better productive contributions, although in a well-developed system, access to more stock options may be so bound up with access to promotion that it would be difficult to isolate the independent motivation effect of stock options.

While recent work on broad-based stock options such as Hall and Murphy (2003) and Oyer and Schaefer (2005) has considered the attraction, retention, and motivation functions of stock options, it has ignored the recognition function of stock options. In an established company, there may be a component of an employee's compensation package that simply recognizes that the employee has a special, typically longstanding, relation to the firm. Seniority wages, for example, perform this recognition function, as do traditional defined-benefit pensions that are based on years of service with the company. There is a tendency for the compensation of a career employee to rise with age, even when the employee has little if any potential for labor market mobility, and hence retention is not an issue. The performance of junior employees, with their career prospects uncertain, will tend to be motivated by the prospect of superior compensation, including more stock options, whereas senior employees will tend to view superior compensation as their due for the contributions that they have made to the firm over the course of their careers. Stock options may be included in this recognition component of compensation. In addition, the recognition function of compensation in general and stock options in particular may reflect cultural biases and norms. For example, in a male-dominated company, it is possible that male employees may be favored over female employees in the allocation of options. Or, it may be that the managers who determine the allocation of options among employees may privilege those employees who they know best. In both these cases, it is possible that the recognition function of stock options plays a significant role in determining the amount of options that an employee receives.

To sum up, as a mode of compensation, companies use the attraction and retention functions of stock options to help manage the external labor market. A company does not employ people, however, simply to attract and retain them. It wants these employees to be productive, and, as with other modes of compensation, it can seek to make use of stock options to manage the internal productive process. It can use stock options to motivate an employee to be more productive in the present and future. Alternatively, it can use stock options to recognize an employee's previous productive contributions to the firm. The motivation function is most important when employees are in their 'prime' in terms of learning new skills and supplying extra effort, whereas the recognition function implies rewards to employees who are past their prime but whose experience or other attributes, such as loyalty, familiarity, or friendship, are valued by those who allocate stock options in the firm.

## The evolution of stock options at Ericsson

### The 1998 plan

Table 3 describes the main features of Ericsson's stock option plans for 1998 through 2002, with the number of

**Table 3** Ericsson's stock option plans, 1998–2002

Option plan	Grant date	Expiration date	Vesting conditions	Exercise price <sup>a</sup>
1998	02/03/99	02/03/06	None	SEK39.92
1999	03/01/00	02/28/07	30% after 3 years, 40% after 4 years, 30% after 5 years	SEK128.00
2000	01/17/00	01/18/07	1/3 per year on 1st, 2nd, and 3rd anniversaries of grant	SEK93.80
2001 (Main)	05/14/01	05/14/08	1/3 per year on 1st, 2nd, and 3rd anniversaries of grant	SEK30.50
2001 (November)	11/19/01	11/19/08	1/3 per year on 1st, 2nd, and 3rd anniversaries of grant	SEK25.70
2002	11/11/02	11/11/09	1/3 per year on 1st, 2nd, and 3rd anniversaries of grant	SEK7.80

<sup>a</sup>Ericsson B shares. Prices have been adjusted to reflect Ericsson's 4:1 stock split on May 8, 2000, and the rights offering of September 12, 2002 that increased Ericsson B shares outstanding by 106.74%.

Source: Internal Ericsson document, 'Summary – Ericsson Option Plans', March 10, 2003.

**Table 4** Distribution of stock options by market area under the 1998 plan

Country	Number of recipients	Percent of recipients	Percent of grants	Average options per recipient	Average no. of options/SEK100,000 salary
Sweden	289	58.5	38.0	4611	505
USA	27	5.5	13.0	16,880	1097
United Kingdom	18	3.6	6.9	13,355	912
Australia	13	2.6	4.1	11,167	1087
Spain	12	2.4	2.7	7999	724
Germany	11	2.2	4.0	12,877	942
China	9	1.8	3.2	12,383	5496
Netherlands	8	1.6	1.2	5163	401
Italy	7	1.4	2.2	11,012	683
Brazil	6	1.2	1.7	13,107	1402
With 3–5 grantees (8 nations)	32	6.5	6.7		
With 2 grantees (8 nations)	16	3.2	3.9		
With 1 grantee (46 nations)	46	9.3	9.7		

Source: Ericsson personnel files.

options awarded in each plan adjusted to reflect stock splits and rights offerings through 2002. The 1998 plan was a small experimental plan, mainly targeted at top executives. The plan rewarded 494 employees, of whom 59% were based in Sweden (see Table 4 and Appendix A). According to the Ericsson 1998 Annual Report (p. 11), the size of the allotment of options under the program depended 'on the Company's earnings per share and the individual's salary and bonus categories.' The number of options awarded per SEK100,000 salary and bonus also included extra options for recipients in countries with high rates of taxation of option income as well as for expatriates working in foreign countries on contract with Ericsson in Sweden.

A select group of mainly Swedish top executives, including the Chairman of the Board and the CEO, nominated the optionees. The list included top executives for each market area. Sweden represented an exception to this rule; the participants in the plan also included the upper stratum of technologists known as 'experts'.<sup>8</sup> For this reason, the average option award per recipient was lower in Sweden than in other market areas. Employees based in the US represented <6% of the recipients, but received 13% of the options granted. US recipients received an average of 16,880 options, compared with 4611 options on average for the much larger group of Sweden-based employees. The number of options granted to individuals ranged from

40,130 to CEO Sven-Christer Nilsson to 767 to a marketing manager in Sweden.

#### The 1999 and 2000 plans

The impetus to the 1998 plan was a desire to compensate Ericsson executives in a manner consistent with the compensation of executives of large Old Economy companies in the US. In contrast, the impetus to the 1999 plan was the acquisition by Ericsson of New Economy companies in the US. The 1999 plan extended stock option compensation to about 1800 people, but the total number of options involved was only 57% of those awarded under the 1998 plan. Whereas participants in the 1998 plan received on average 7093 options, those in the 1999 plan received on average only 1111 options. Moreover, relative to shares of Ericsson employment, the proportions of optionees and options in North America went from being distinctly underrepresented in the 1998 plan to distinctly overrepresented in the 1999 plan.

The 1999 plan still viewed stock options as a requisite of higher-level employees. Some 70% of the participants in the 1998 plan received options under the 1999 plan. The repeat participants received option allocations that were on average 83% more than those awarded to newcomers to the 1999 plan. Although 3.65 times as many employees



participated in the 1999 plan as in the 1998 plan, it still involved <2% of Ericsson's employees. Only 303 out of 12,200 North American employees – 2.5% – participated in the 1999 plan.

The 1999 plan was actually implemented in March 2000, after the launch of the 2000 plan in January of that year. Like the 1999 plan, the 2000 plan was aimed at dealing with labor mobility in the US, but was extended to a much broader base of employees that included large numbers of non-executive employees. At 8225, the number of recipients in the 2000 plan was over 4.5 times the number included in the 1999 plan, and at 71.4 million, the number of options awarded was almost 13 times greater than the number of options offered under the 1998 and 1999 plans combined. More than two-thirds of the participants in the 2000 plan were based in North America (USA and Canada), and they received 48% of the options awarded under the plan, even though employees in the North America region represented just 13% of all Ericsson employees.

If the 1998 plan reflected the mindset of a typical Old Economy company that used stock options to recognize the contributions of its career executives, the 2000 plan reflected Ericsson's attempt to attract and retain New Economy labor that was accustomed to moving from one firm to another. The orientation of the 2000 plan derived from Ericsson's strategic shift from incremental in-house product development to radical innovation through the acquisition and integration of young technology firms. Internet networking was developing outside the group of established companies that are core suppliers of switched telecommunications networks. The impetus to the 2000 plan was Ericsson's attempt to integrate Internet-related data communications and switched telecommunications technologies into a converged system. With rapid market growth in the emerging field of data communications rather than the traditional field of switched telephone networks, Ericsson, like its established competitors in the telecommunications industry, redirected internal resources to acquire the technological capabilities that were needed to compete for the new growing markets (see Carpenter *et al.*, 2003; Glimstedt and Zander, 2003).

In their letter to shareholders in the 2000 Annual Report (p. 6), former CEO Lars Ramqvist and current CEO Kurt Hellström looked back on the evolution of this New Economy strategy, stating that Ericsson's 'Internet and IP R&D started during the first part of the 1990s and was complemented with the 'String of pearls' strategy, that is,

acquisitions of suitable datacom and router technologies, ... created in 1995 and implemented in 1997'. It was Sven-Christer Nilsson, CEO from March 1998 to July 1999, who most clearly identified the need to catch-up within TCP/IP technology, and apply it to wireless communications technology. Most of the acquisitions were executed under Nilsson's regime.

Until the mid-1990s Ericsson closely tailored its strategic choices concerning data communication networks to ISDN and ATM-based network services. In response to the market opportunities that arose from the ISDN-project, Ericsson initiated an entirely new (but ill-fated) architecture known as AXE-N. As mobile telecommunications and GSM gained momentum, switched mobile telecommunications emerged as the main internal magnet, attracting most of the R&D funds. Between ISDN and GSM, top executives such as Nilsson thought that Ericsson was missing the bandwagon called the Internet. As indicated in Table 5, all of Ericsson's major direct competitors were in the process of building up competencies in TCP/IP-related technologies through acquisitions. Of the eight equipment companies listed in Table 5, only Cisco was coming from TCP/IP into telecommunications. Given the increasingly obvious market opportunity, Cisco's challenge pressured the other seven to acquire TCP-IP capabilities (see Carpenter *et al.*, 2003).

In 1997, Ericsson made an early-stage investment in the Internet equipment startup, Juniper Networks, based in Silicon Valley (Business Wire, August 29, 1997). In 1999, the two companies announced a set of strategic agreements, including the distribution of Juniper's M40 Internet backbone router as the Ericsson AXI 520. Ericsson also deepened its equity stake in Juniper and took a position on its Board (RNS, March 16, 1999; see also Business Wire, October 12, 1999).

In September 1998, Ericsson paid US\$285 million for ACC, a 220-person vendor of integrated, carrier-class remote access and internetworking products, based in Santa Barbara, California.<sup>9</sup> Ericsson extended a specific incentive to the CEO, and created a cash pool for 10 or 11 other key people. Another 30–40 people also got incentives of a lesser value (interview with Rolf Eriksson, Ericsson, June 19, 2003).

In April 1999, Ericsson made two IP acquisitions in the US, Touchwave on the West Coast and Torrent on the East Coast. Touchwave was a venture-backed Silicon Valley startup founded in 1997 that produced an IP network-integrated phone system aimed at small- and medium-sized

**Table 5** Acquisitions by telecommunications equipment companies, 1995–2000

	<i>Cisco</i>	<i>Lucent</i>	<i>Nortel</i>	<i>Ericsson</i>	<i>Nokia</i>	<i>Alcatel</i>	<i>Siemens</i>	<i>Marconi</i>
1995	4							
1996	7	1						
1997	6	4	1	1				
1998	9	12	3	2		2		
1999	18	14	5	8	6	4	2	5
2000	23	8	9	1	3	2	3	7
Total	67	39	18	12	9	8	5	12

Sources: Company websites and annual reports.

businesses. It had 40 employees at the time of the acquisition, and cost Ericsson US\$46 million in cash. Ericsson paid off the vested stock options of the employees at their value, and created a US\$4 million cash pool to retain key people. The company also offered US\$900,000 as retention bonuses to five senior executives to stay with Ericsson for 2 years; only the ex-CEO of Touchwave turned down the offer (interview with Rolf Eriksson, Ericsson, June 19, 2003).

The acquisition of Torrent, based in Silver Spring, Maryland, gave Ericsson control over a carrier-class gigabit IP router. Torrent had been founded in 1996 by the former head of switching architecture development at Bell Labs and had only 80 employees. Ericsson paid US\$400 million in cash to buy the firm, an expensive acquisition on a per employee basis, especially given that competitors such as Alcatel, Cisco, Lucent, and Nortel were using their over-valued stock rather than cash to make acquisitions (see Carpenter *et al.*, 2003). In terms of absolute and per employee cost, Torrent was far and away the most expensive pearl in the string.

Ericsson's investments in New Economy companies compelled its top management to think about how to use stock options as a tool for attracting and retaining relatively youthful and highly mobile technical and administrative personnel who would not normally have qualified for options under an Old Economy plan. The New Economy was booming, and labor market mobility by high-tech personnel was at its peak. The 1999 plan and even more so the 2000 plan reflected Ericsson's acquiescence to the pressure for stock options emanating from the US.

The Qualcomm acquisition in particular forced Ericsson to move toward the broader based approach in the 2000 stock option plan. With 1200 employees, the infrastructure division of Qualcomm was Ericsson's biggest acquisition in terms of staff. Based in San Diego, California and founded in 1985, Qualcomm had developed CDMA technology as the wireless telephony standard for the US, and had global ambitions. Prior to the acquisition, Ericsson and Qualcomm had had an acrimonious relationship. During the first half of the 1990s, while Ericsson was promoting GSM as the global standard, it was also claiming infringement by Qualcomm on CDMA patents that it held. Qualcomm in turn sued Ericsson for 'unfair competitive behavior' because of disparaging statements that Ericsson had made about a Qualcomm product (Exchange Telecommunications Newsletter, February 23, 1996; Extel Examiner, December 11, 1996). In March 1999 Ericsson announced that it would acquire Qualcomm's infrastructure division for US\$121 million in cash as part of a settlement of the patent dispute.

No sooner had the acquisition been made than some former Qualcomm employees sued Qualcomm for its failure to include a sum in the purchase price to compensate them for their unvested stock options. A total of 1053 people who were transitioning to Ericsson had unvested options, ranging in value from US\$50,000 to US\$1.8 million (AM Cycle, May 7, 1999; PR Newswire, May 10, 1999). To settle the issue, Qualcomm and Ericsson created a Bonus Retention Program that included a cash pool to cover as much as 50% of the value of the unvested options of those employees who stayed with

Ericsson and signed a waiver not to enlist in a class-action lawsuit.

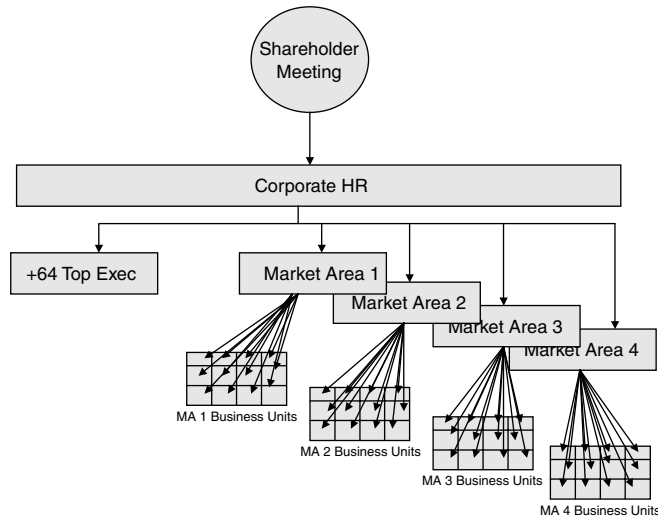
The Qualcomm experience forced Ericsson's management to recognize the importance of non-executive stock options in the New Economy. In November 1999, with New Economy labor market competition becoming ever more intense, Ericsson held a special shareholders' meeting to approve a broad-based stock option plan that would be mainly aimed at its US-based employees. Indeed, Ericsson's Board recommended that the 2000 plan be followed by (subject to shareholders' approval) 2001 and 2002 plans *for the United States only* while the 'rest of the world' allocation made in the 2000 plan would be a one-off event (Ericsson, 2000a).

The 2000 plan was much more broad-based than the previous plans, involving 8225 employees, almost 8% of Ericsson's labor force. More than two-thirds of these employees, 5539 of them, were based in North America, and almost all were in the US (which accounted for 98.5% of all Ericsson's North American employees). The number of options allocated under the 2000 plan was over 12 times the number allocated under the two previous plans combined. Almost half of these options went to North America, with an average of 6018 options per participant. This average was well under that of the other market areas, reflecting the more broad-based participation of North American employees in the 2000 plan. The acquisition of US technology firms had pushed Ericsson into using stock options as a mode of compensation for a broad base of employees.

#### The 2001 and 2002 plans

As already mentioned, the Ericsson Board agreed in November 1999 to budget for three consecutive option programs for the US, where the labor market pressure was most intense, and one plan only for the rest of the world, Sweden included. But Marcus Sheard, head of worldwide compensation, and Britt Reigo, head of Corporate HR, advocated a more equitable balance between Ericsson's US and non-US personnel, thus reinforcing a growing demand by the company's non-US employees for participation in a broad-based stock option plan. According to Sheard, many experts, senior engineers and managers who realized that they would have been eligible for stock options, had they worked for Ericsson in Dallas or San Diego, vigorously demanded the spread of broad-based option plans across Ericsson's global operations. The end of the Internet boom, already perceived at Ericsson in late 2000, brought a marked decrease in interfirm mobility on the part of high-tech personnel in the US, as well as elsewhere, thus removing the premise of continuing boom conditions that underlay Ericsson's earlier intention to focus not only its 2000 plan but also its 2001 and 2002 plans on the US (interview with Marcus Sheard, Ericsson, February 19, 2004). Instead the 2001 main plan and the 2002 plan, both conceived in late 2000, were reconfigured to conform with Ericsson's global compensation strategy rooted in its established organizational structure.

Nevertheless, in 2001, before it became apparent how deep the downturn would go, Ericsson adopted a special plan (which we have designated the 2001 November plan) aimed at new recruits that would enable the company to continue to address the problem of attracting employees in



**Figure 2** Organization of the stock option allocation process at Ericsson.

labor markets characterized by high interfirm labor mobility. A total of 1052 employees received options under the November plan. While the North America market area had 10.5% of all Ericsson employees, under this plan it accounted for 43.0% of the employees who received options and 52.8% of the options allocated (see Appendix A).

The early 2000s were marked, however, by downsizing, not recruitment. Under Hellström's cost-cutting regime, Ericsson downsized total worldwide employment from about 105,000 employees in 2000 to less than 65,000 in 2002. As demand for new carrier networks collapsed, all major telecommunications equipment manufacturers suffered, some far worse than Ericsson (see Carpenter *et al.*, 2003). Meanwhile Sheard and his team adapted the rules for allocating stock options to build on the company's existing organizational structure. In particular, Corporate HR introduced a new tool for nominating optionees – the Key Contributor, or KC, program – that required some 600 local managers to choose the 15% of the employees under their span of control who would be eligible to receive stock options under the 2001 and 2002 plans.

### The KC program

After the special Board meeting in November 1999, Sheard and his team wrote in an internal memo to Hellström, the new CEO, that options should be allocated to three distinct groups of employees: 'Top Executives', 'Next Generation Managers' and 'Key Talents'. As illustrated in Figure 2, Corporate HR made the allocations of options to top executives (IPE 64 and higher) directly, and distributed option budgets to market areas (or business segments) based on numbers of employees. Market area and business segment managers then allocated the budgeted options across business units or divisions under their span of control. At the business unit level, it was the responsibility of line managers to determine the allocation of options among those individuals within their units who they deemed to be 'Next Generation Managers' or 'Key Talents'.

The decision to create a plan for 2001 and 2002 that was more inclusive and equitable across Ericsson's global operations called for the systemization of the option

allocation process. The challenge for Corporate HR was to identify those employees who were most 'valuable' to the company, quite apart from current salary or hierarchical position (IPE level), and for this purpose Sheard and his team devised the KC program. If mainstream Swedish corporate culture can be said to be egalitarian, with an emphasis on the role of the team and team players, the KC initiative represented a sharp break with the dominant corporate culture. In a memo entitled 'Key Contributors Directive', Sheard advised: 'Central to our competitive effort is the acceptance that not all parts of our business are equally critical to our future success. The same goes for individuals: we accept that some – because of a mixture of skills, talent, and drive – are more important than others. We call them KCs' (Ericsson, 2000b).

The KC program was expected to result in a list of 16,000 names, or about 15% of the Ericsson labor force at the end of 2000. Corporate HR refrained from issuing direct guidelines or clearly defined criteria that would identify a KC. Rather, it was expected 'that Local HR would, in discussion with local management, agree on its own definition of a KC'. Local managers, however, were explicitly asked to disregard hierarchical position, age, and gender. Instead they were urged to consider 'individual performance' (rather than scarcity of skills) and 'future potential' (Ericsson, 2000b).

When KCs were first nominated in November 2000, Corporate HR felt that many business units, particularly in Sweden, were taking a group approach to making nominations. For example, Corporate Technology nominated almost 50% of their employees, and many units nominated groups of professionals. Especially in Sweden, it appeared that local managers were reluctant to distinguish among employees as individuals in making nomination decisions.<sup>10</sup>

In the second round of KC nominations that took place in 2002, Sheard and his team sought to impress upon local managers that they should select option recipients based on strong performance, professional potential, and critical competence. Corporate HR distributed a 'Manager's check list' to guide local managers in explaining to option recipients why they had been chosen and the role of stock options in the ongoing employment relation. Reiterating the 'criteria for selecting an optionee', the check list advised local managers to explain to the optionee the superior results that he or she had achieved, his or her potential at Ericsson, and the character of the critical competence that he or she contributed to the company (Ericsson, 2002).

One result was that there were a lot of new faces among the KCs in 2002 compared with 2000. Almost 43% of the 2002 KCs had not been KCs in 2000, with about 5000 new KCs resulting from an expansion of the program and another 2500 new KCs replacing participants under the 2000 program who were not renominated. In the process, the average age of KCs declined; in 2000 the highest concentration in the age distribution was among 35–39 year olds whereas in 2002 it was among 30–34 year olds (Ericsson, 2003a).

The 2000 KC program provided the basic foundation for the allocation of options under the 2001 plan, with all KCs eligible for options. It was then up to local managers to

**Table 6** Grant size recommendations by 'difficult to replace' assessment

<i>Criterion</i>	<i>No. of options</i>
Managers and experts (IPE 62–63)	4000
Extremely difficult to replace	3000
Very difficult to replace	1500
Difficult to replace	750
None of the above	0

*Source:* Memo, Individual Distribution Principles, LME/DSK/K Stefan Årlund, 2001-03-21.

allocate their option budgets among the local employees who were on the KC lists in their span of control. In deciding how many options to allocate to an employee, Corporate HR asked local managers to reflect on how hard it would be to replace an individual KC. As shown in Table 6, Corporate HR suggested allocations based on the perceived difficulty of replacing an individual at IPE 61 and below, while non-executive 'managers and experts', at IPE 62 and 63, were accorded special allocation status (Ericsson, 2001).

The general impact of these guidelines was to reinforce the notion, which as we have seen underlay the KC program more generally, that some employees were more valuable to the company than others. At the same time, the 'difficult to replace' language may have led local managers to view 'retention' as the foremost function of stock options in determining the allocation of options among KCs. Yet by the time these local allocations under the 2001 plan were actually made, the telecommunications industry had begun its recessionary decline. Given that local managers ultimately had a free hand in determining the allocation of their option budgets among the KCs under their span of control, they could also use the allocation of options to perform a 'motivation' function, one that would encourage the recipients to perform better as individuals in the future. Then again, local managers were also free to allocate more or less options among recipients as 'recognition' of their prior contributions to the firm. With the KC program in place, what roles did 'retention', 'motivation', and 'recognition' play in determining the actual allocation of options by local managers among eligible employees? Corporate HR had an interest in understanding the grounds on which local managers not only nominated KCs but also the rationale whereby they allocated their option budgets among these designated elites.

**Allocation of stock options by local managers in Sweden**

The account that we have given of the evolution of stock option plans at Ericsson from 1998 to 2002 shows that, at the corporate level, the main function of stock options changed from recognizing high-level executives to managing interfirm labor mobility in the high-tech labor market, especially in the US New Economy, to managing the internal productive process by using the KC program to adapt stock options as a mode of compensation to Ericsson's existing organizational structure. Given the option budgets that Corporate HR allocated to them, what determined local managers' allocation of stock option budgets among KCs under their span of control? To generate some answers to this question, we did a detailed

statistical analysis of the allocation of stock options among recipients under the main 2001 plan, the first plan that made use of the KC program. These local allocations were made at a time when Ericsson, like all other established telecommunications equipment companies, was in a down-sizing mode but when it was still not apparent how drastic the cutbacks would be over the coming years. By 2001, however, even in the US, interfirm labor mobility was no longer driving stock option awards.

We do not have direct evidence, for example that which could have been generated by responses to a survey questionnaire, on why local managers allocated more or less options to KCs under their spans of control. Instead we construct a 'functions' model of stock option allocation that makes use of the characteristics of the option recipients to explain why local managers allocated varying numbers of options to them. We ask: Did an employee who received stock options have characteristics that suggest that he or she was the type of person that the company had a special interest in attracting, retaining, motivating, or recognizing? On the basis of independent variables constructed from employee characteristics that seek to capture the attraction, retention, motivation, and recognition functions, we can then estimate models to explain the rationale that local managers used in the actual allocation of stock options among eligible personnel.

While we had access to data on all of the recipients under all of the Ericsson stock option plans, we had to make choices about which data set would be most worthwhile to analyze, given the resource constraints of our project. We decided to focus on a data set of employees based in Sweden who received stock options in 2001, primarily because of our interest in discerning how stock options were functioning in Ericsson's home base at a time when the company was, as we have shown, adapting stock options to its existing organizational structure.

In total 5110, or 14%, of Ericsson employees based in Sweden received stock options under the 2001 main plan. The data set that we use, however, excludes from the analysis upper-level corporate managers (hierarchical level, or 'IPE', 64 and up plus top corporate executives), leaving 4603 observations. The personnel files yielded sufficient information on 3782 of these 4603 employees to be included as observations for purposes of statistical analysis. Note that the database that we use for statistical analysis only includes those employees based in Sweden who participated in the stock option plan; it does not include employees who did not receive options. Our analysis takes the designation of a subset of employees as KCs as given, and does not seek to explain those choices. Our statistical results, therefore, only indicate the bases on which local managers, whom we shall henceforth call 'allocators', allocated more or less options to individual employees who had already been selected to participate in the 2001 main stock option plan.

The data set of Sweden-based employees in the 2001 main plan only permits us to test a 'three functions' model because the 2001 main plan was not used to attract new employees to Ericsson. Rather, as already noted, the 'attraction' function was the specific purpose of the much smaller 2001 November plan. In fact, in the Swedish 2001 database that we have used for regression analysis, there are only 21 people who had been hired in the previous year.

As we have seen, in receiving their option budgets from the company, allocators were given guidelines concerning certain option thresholds to which they should adhere, based on their assessment of the degree to which they judged certain employees difficult to replace. 'Difficult to replace' employees were to receive 750 options, 'very difficult to replace' 1500 options, 'extremely difficult to replace' 3000 options, and 'managers & experts' 4000 options. The number of options received by the 3782 people in the sample ranged from 750 to 12,000 with a mean of 1994 options and a median of 1800 options.

One cannot use the observed option thresholds in the 'difficult to replace' guidelines as RETENTION variables because the very construction of this measure in terms of numbers of options entails an inherent bias to explain a high proportion of the variance. Indeed, a regression that uses these thresholds as RETENTION variables, along with various MOTIVATION and RECOGNITION variables sketched out below, yields an adjusted  $R^2$  of over 84%. For estimating the 'three functions' model of the local allocation of options, we need to measure RETENTION in terms of the characteristics of option recipients rather than the corporate 'difficult to replace' option thresholds.

For the RETENTION variable, we used the functional area in which a recipient worked. The rationale for this measure is that, given the state of the general labor market at any point in time, some functional capabilities are more in demand than others, and local managers will want to allocate more options to individuals in those high-demand areas to retain ostensibly more highly mobile employees. Table 7 provides the basic data on the distribution of options across and within functional areas in the database. Note that, at 3010, the average number of options granted was greatest in Manufacturing (MANU), and that, at 1746, it was lowest in Other General and Administrative (OGA). An exceptionally large proportion of option recipients in Manufacturing received 4000 or more options, contributing to an exceptionally large SD (1948) in the allocation of options among recipients.

In the regression analysis, FIN, HR, ISIT, MANU, MSPM, OPS, R&D, and SSM are represented as dummy variables,

with a value of 1 if a recipient is in that functional area and 0 if he or she is not. In the regression equation, the functional category OGA is excluded as a variable, so that the coefficients on the variables in the included functional categories show the number of additional options a recipient receives as a result of being in a particular category relative to the excluded category, OGA.

In a large company like Ericsson, stock options can serve to motivate employees by *reinforcing* their existing positive assessments of their career progress within the company. Put differently, we posit that if an employee is not already motivated to make rapid career progress, an award of more rather than less stock options to that employee is not likely to instill that motivation. Hence, for motivation purposes, we can hypothesize that allocators will want to award more options to employees who are making more rapid career progress. One such 'fast track' measure is whether or not the employee has been named a Corporate Next Generation Executive (CNGE), a designation conferred on a select group of employees, ranging in age from 28 to 50 in 2001 with an average age of 37, whom the company viewed as being destined for higher management positions. In our usable database of 3782 employees, only 59 employees have the CNGE designation. The 3723 non-CNGE employees were granted an average of 1976 options; the CNGE employees, an average of 3146.

RECOGNITION variables should be based on characteristics of employees that make them more or less visible to allocators, thus leading these allocators to award them more or less options. One such measure is the length of service of the employee with the company. In our data set of 3782 employees, the average number of years with the company is 10.3. We would hypothesize that employees who have more years of service with the company are more visible to allocators, which leads them to garner more options for recognition purposes.

A second measure of recognition is the 'closeness' of the option recipient to the allocator. A very good measure of closeness in this context is whether the local manager to whom the employee reports is or is not the same person who is allocating options to that employee. In our data set, for 54%

**Table 7** Allocation of stock options by functional area

Functional area	No. of recipients	Total no. of options	Mean	Med.	Min.	Max.	SD	Recipients, 4000+options	Percent, 4000+options
FIN	125	326,654	2613	2700	750	8000	1575	19	15.2
HR	101	246,890	2444	2700	750	8000	1503	14	13.9
ISIT	78	192,350	2466	2000	750	12000	1638	7	9.0
MANU	296	890,820	3010	2700	750	12000	1948	89	30.1
MSPM	758	1,351,200	1783	1500	750	8000	1120	49	6.5
OPS	136	246,950	1816	1500	750	12000	1345	8	5.9
R&D	1655	3,083,410	1863	1800	750	12000	1114	77	4.7
SSM	188	426,740	2270	1800	750	12000	1578	21	11.2
OGA	445	776,975	1746	1500	750	8000	1122	26	5.8
Total	3782	7,541,989	1994	1800	750	12000	1324	310	8.2

FIN = finance; HR = human resources; ISIT = information systems/information technology; MANU = manufacturing; MSPM = marketing, sales, and product management; OPS = other professional services; R&D = research and development; SSM = sourcing and supply management; OGA = other general and administrative.

Source: Ericsson personnel files

of the employees, the local manager to whom the employee reports is also the allocator (this relation holds for 61% of the female option recipients and 53% of the male option recipients). In some cases, the employee who is awarded options is himself or herself also the allocator and/or the 'reporting' manager, but in most cases the optionee is neither.

A third possible measure of recognition is gender. In our data set, 85% of the option recipients and 85% of allocators are male. Given the other variables in the model, the inclusion of the gender variable seeks to determine whether there is any evidence of gender bias on the part of allocators in the award of options.

Finally, a fourth recognition variable is whether or not the employee received options in the 2000 plan. About 19% of the 2001 participants received options in 2000. If, controlling for all other variables that explain the variance of options, the receipt of options in the 2000 plan has a significant impact on the number of options that one is awarded under the 2001 plan, it could be argued those who received options in 2000 were more visible to allocators in 2001, thus accounting for the additional options that they were awarded in 2001.

Note that a variable that we have not included in Model 1 is the salary of the option recipient. The stock option database that Ericsson provided to us did not include information on salary. In any case, within our 'three functions' model, it would be difficult to determine whether a recipient's salary represented a RETENTION, MOTIVATION, or RECOGNITION variable. Some functions might have higher average salaries than others, and hence reflect 'retention' in our model. A higher salary may be awarded for 'motivation' purposes. Or a higher salary may represent a form of 'recognition'. Insofar as salary represents a RECOGNITION variable, it would be highly correlated with years of service, which is included in the model. Indeed, in testing alternative specifications of the model, we found that years of service and age of the option recipient were highly correlated, and we therefore elected to drop age as a RECOGNITION variable from the model.

**Model 1: full data set**

Table 8 summarizes the results of regression analysis of the 'three functions' model of the allocation of stock options among predesignated KCs (full results are presented in Appendix B). In Model 1, all of the coefficients on the RETENTION variables are positive (given the particular

category, OGA, that we excluded from the regression), and five of the coefficients (FIN, HR, ISIT, MANU, and SSM) are statistically significant at the 1% confidence level. The coefficients on the retention variables show the extra number of options that one gets from being an option recipient in, for example, 'manufacturing' (MANU) relative to being a recipient in 'other general and administration' (OGA); in this case, being an option recipient in MANU nets one 1179 extra options. According to the retention hypothesis, the positive and statistically significant coefficients on FIN, HR, ISIT, MANU, and SSM suggest that option recipients in these functions get more options than recipients in OGA because, controlling for all other factors, the company is more concerned with retaining individuals with FIN, HR, ISIT, MANU, and SSM capabilities relative to individuals with OGA capabilities. It should be noted that these results appear to be driven by the unequal option budgets per recipient in the different functional areas (see Table 7), which in turn are a function of Corporate HR option budget decisions and/or KC-nominator decisions concerning the number of total recipients in functional areas among whom given option budgets will be shared.

The coefficient on the MOTIVATION variable, CNGE, is statistically significant at the 1% level. Holding the RETENTION and RECOGNITION variables constant, recipients who are Corporate Next Generation Executives get an extra 786 options (25% of the average number of options that CNGE recipients receive) compared with the vast majority of recipients who are not accorded this status.

Of the RECOGNITION variables, the coefficient on Closeness is significant at the 1% level and that on Years at the 5% level. Having an allocator who is the same as one's reporting manager yields an extra 411 options, while each additional year with the company results in an extra 6.2 options. Neither Gender nor 2000 Participant has a statistically significant impact on the number of options an employee receives. Gender is in fact negative; there is thus no evidence of a gender bias in the allocation of options among recipients (although there may have been in allocators' choices of recipients as KCs from among the larger pool of employees). Only 19% of those who received options under the 2001 plan had also received them in 2000. In addition, as we have seen, the design of the 2001 option plan was completely different than its predecessor.

This model explains 10.5% of the variance in the number of options allocated across participants in the 2001 plan. If we run the same regression, but exclude from the database

**Table 8** Summary of main regression results

Model no.	Model description	N	Adjusted R <sup>2</sup>	Statistically significant coefficients		
				P-value < 0.01	P-value < 0.05	P-value < 0.10
1	Full data set	3782	0.105	FIN, HR, ISIT, MANU, SASM, CNGE, Closeness	R&D, Years	
2(i)	GSM-TDMA-EDGE systems	647	0.093	MANU, SASM	Closeness, 2000 Participant	FIN, ISIT
2(ii)	Mobile systems	330	0.291	FIN, MANU, CNGE, Closeness	HR	
2(iii)	Microelectronics	192	0.484	HR, MANU, SASM, Closeness		

Dependent variable: stock options granted to individual non-executive recipients.

the 310 people (or 8.2% of the total sample) who received 4000 or more options – that is, ‘Managers and Experts’ insofar as allocators adhered to the corporate ‘difficult to replace’ guidelines – the adjusted  $R^2$  falls to 5.2%.<sup>11</sup> The statistical significance of the coefficients remains the same, except that the coefficients on both R&D and Years are now significant at the 1% rather than 5% level. Given the high concentration of 4000+ recipients in Manufacturing, however, with the exclusion of the apparent ‘Managers and Experts’ from the analysis, the extra options that a recipient gets from being in Manufacturing falls from 1179 to 358.

It should be mentioned that low levels of explanatory power are quite usual with cross-sectional databases such as this one; we are attempting to impose our simple model on a complex social process in which the various actors may be making choices according to their own rationality, not according to that assumed by the model. A major reason for doing statistical analyses of this type is not to generate results that give definitive answers but rather as part of a process that stimulates reflective thinking on the part of those who are involved in shaping organizational structure and outcomes, and can thus help us ‘discover’ the actual underlying model of decision-making. For this reason as well, we may gain further insight by estimating the models at a more disaggregated level.

#### Models 2(i), 2(ii), 2(iii): business units/divisions

We have seen in Model 1 that there are significant differences in the number of options allocated across functions. It may have also been the case that there were systematic differences in the allocation of options across divisions or business units. The mix of employees likely differed across divisions or business units. Additionally, allocators in different divisions or business units may have felt different pressures from the corporation above and their subordinates below, as well as from the competitive environment, in the allocation of options. Table 9 provides descriptive statistics for the allocation of options among recipients by division or business unit.

We ran regressions on the distribution of stock options for the 13 divisions or business units that, in the sample of 3782 recipients, had 100 or more employees receiving options. As shown in Table 9, adjusted  $R^2$  for these regressions ranged from 9% (GSM-TDMA-EDGE Systems, with 647 observations) to 48% (Microelectronics, with 192 observations). In this paper, as versions of Model 2, we include the results for these two business units plus Mobile Systems Division, with an adjusted  $R^2$  of 29% and 330 observations.

Among the functional variables, many of the coefficients have different signs than in Model 1 (the full data set). The coefficients on MANU are positive and statistically significant at the 1% level for all three divisions/BUs in Model 2. In GSM-TDMA-EDGE Systems only 17 of the 647 recipients were in MANU, but they were allocated an average of 2982 options compared with 1987 options for all recipients in the business unit. In Mobile Systems 20 MANU recipients received an average of 3040 options compared with an average of 1882 for all 330 option recipients in the division. In Microelectronics, six MANU employees received an average of 5000 options compared with an average of 1882 for all 192 option recipients in the

business unit. Being in the MANU functional category was worth an extra 1169 options in GSM-TDMA-EDGE Systems, 1290 in Mobile Systems, and 3676 in Microelectronics.

There is more variation in the coefficients of some of the other functional categories. For example, the coefficient on HR is positive and statistically significant in Mobile Systems (in which there were five HR recipients with an average of 2480 options) as well as in Microelectronics (in which there were five HR recipients with an average of 2050 options) but negative and not significant in GSM-TDMA-EDGE Systems (in which there were 20 HR recipients with an average of 1890 options). Similarly the coefficient on SASM is positive and statistically significant in GSM-TDMA-EDGE Systems (in which there were 32 SASM recipients with an average of 2663 options) as well as in Microelectronics (in which there were four SASM recipients with an average of 2375 options) but negative and not significant in Mobile Systems (in which there were five SASM recipients with an average of only 1440 options).

Whereas, according to Model 2, a recipient in Microelectronics received 1214 extra options for being in SASM compared with other recipients in his or her business unit, a recipient in Mobile Systems received 101 fewer options. It may be that these varying results are driven by the small number of recipients (in these cases, four or five) in certain functional areas in certain divisions/BUs. Larger numbers of recipients in these function/division or function/BU cells might have yielded different statistical results.

There are sharp differences across the divisions/BUs in the CNGE results. The coefficient on CNGE is positive and statistically significant at the 1% level in Mobile Systems, but negative and not significant in GSM-TDMA-EDGE Systems and nonexistent in Microelectronics, which had no CNGE recipients. In all, 20 CNGE recipients in Mobile Systems received an average of 3165 options, whereas 10 CNGE recipients in GSM-TDMA-EDGE Systems received an average of 2400 options.

The coefficient on Years and Gender is not statistically significant in any of the three divisions/BUs. The coefficient on 2000 Participant is positive and significant at just over the 1% level in GSM-TDMA-EDGE Systems but negative and insignificant in Microelectronics, and positive and insignificant in Mobile Systems. The coefficient on Closeness, which is the strongest RECOGNITION variable across the full data set, is positive and significant across all three divisions/BUs but at different confidence levels. Closeness yields a recipient an additional 383 options in Mobile Systems, 317 options in Microelectronics, and 197 options in GSM-TDMA-EDGE Systems.

As in the case of Model 1, we also ran regressions with recipients of 4000 or more options dropped from the database. In the GSM-TDMA-EDGE Systems regressions, with 31 of 647 observations removed, adjusted  $R^2$  decreases from 9.3 to 4.0%, and the coefficients on Manufacturing, Closeness, and 2000 Participant are no longer statistically significant.<sup>12</sup> In Mobile Systems, with 10 of 330 observations removed, adjusted  $R^2$  drops from 29.1 to 20.4%, while HR has a significant impact at the 1% level and the coefficient on FIN is no longer significant. In Microelectronics, with five of 192 observations removed, adjusted  $R^2$  declines from 48.4 to 25.3%, and the coefficient on Years now is significant at the 5% level.

**Table 9** Allocation of options by division or business unit

<i>Division or business unit</i>	<i>Total no. of options</i>	<i>Ave.</i>	<i>Min.</i>	<i>Max.</i>	<i>SD</i>	<i>No. of recipients by Div/BU</i>	<i>Adj. R<sup>2</sup></i>	<i>Recipients 4000+ options</i>	<i>Percent 4000+ options</i>
GSM-TDMA-EDGE systems	1,285,800	1987	900	6000	1089	647	0.09	31	4.8
Mobile systems division	621,200	1882	900	8000	969	330	0.29	10	3.0
Internet applications	682,150	2215	750	7000	1276	308	0.20	34	11.0
WCDMA, PDC systems	554,100	1972	900	6000	1140	281	0.31	14	5.0
Defence	407,750	1773	950	6200	1111	230	0.11	4	1.7
Mobile systems transmission	349,200	1663	750	8000	1228	210	0.40	14	6.7
Microelectronics	258,500	1346	750	8000	1011	192	0.48	5	2.6
Corporate common units	316,500	1840	750	6100	1349	172	0.42	22	12.8
Antenna near products	334,500	2003	900	6000	1407	167	0.18	16	9.6
Network core products	334,100	2336	900	6000	1519	143	0.24	18	12.6
Ericsson corporate functions	381,389	2686	750	6000	1348	142	0.10	27	19.0
Cables	193,400	1758	1000	6000	1141	110	0.25	7	6.4
Service provider & carrier networks	243,700	2321	1000	6500	1093	105	0.19	3	2.9
Enterprise systems	229,550	2495	750	12,000	2314	92		8	8.7
Market unit	114,750	1471	750	12,000	1795	78		2	2.6
Telecom management & prof. services	147,300	2104	1000	8000	1850	70		12	17.1
Access network	109,250	1762	1000	5000	1284	62		9	14.5
ATM backbone networks	97,800	1686	750	3000	590	58		0	0.0
Business innovations	120,900	2572	750	7000	1862	47		10	21.3
Global services division	118,000	3026	1000	8000	2230	39		21	53.8
Special business systems	68,100	1746	900	3000	510	39		0	0.0
Multi-service networks division	71,000	1972	1000	6000	1225	36		4	11.1
Internet solutions	39,750	1728	750	4000	1259	23		5	21.7
IP multimedia	44,600	2124	1000	4000	631	21		1	4.8
Ericsson education	59,000	3105	1000	8000	2865	19		8	42.1
Optical networks	34,750	2044	850	3000	799	17		0	0.0
Data backbone & optical Ntwks. Div.	21,950	1372	850	2000	427	16		0	0.0
Network roll-out	72,000	4500	4000	8000	1366	16		16	100.0
Customer services	13,000	1000	1000	1000	0	13		0	0.0
Speech processing products	18,000	1800	1800	1800	0	10		0	0.0
Edgecom	24,000	3000	1500	8000	2087	8		1	12.5
EHPT	16,500	2750	750	4500	1475	6		2	33.3
Home communications	12,500	2083	1000	3000	801	6		0	0.0
IP network edge and access	13,000	2167	1000	6000	1941	6		1	16.7
Ericsson microsoft mobile venture	8700	2175	1000	5250	2061	4		1	25.0
Ericsson/microsoft	17,000	5667	5250	6500	722	3		3	100.0
Corporate common functions	5000	2500	1500	3500	1414	2		0	0.0
GSM & UMTS phones	1700	1700	1700	1700	0	1		0	0.0
Unknown	101,600	1917	900	6000	913	53		1	1.9
Total	7,541,989	1994	750	12,000	1324	3782	0.10	310	8.2
13 div/BUs units with 100+ employees	5,718,589	1963	750	8000	1089	3037		31	4.8
13 100+ div/BUs as % of total	75.82				969	80.30		10	3.0

Source: Ericsson personnel files.

These results from the divisions/BUs, therefore, exhibit considerable variation in the explanatory power of the 'three functions' model as well as in the particular variables that are important determinants of the distribution of options among employees across divisions/BUs. The fact that there is not one model that fits all divisions/BUs suggests that the operation of these units themselves, and the mix of employees in them, may have been important determinants of the allocation of options across all Sweden-based recipients in the 2001 main plan.

#### Alternative specification for 'motivation'

Finally, given that only 59, or 1.6%, of the 3782 employees in the full sample were designated CNGE, we wanted to construct an alternative variable that might capture the rate of progress of an employee in the company, and that therefore, for reasons outlined above, might serve as a MOTIVATION variable in the stock options allocation model. A possible MOTIVATION variable, for which there is more variation among the participants, is the rate at which an employee progressed up the Ericsson hierarchical

ladder. This 'rate of progress' variable measures the number of 'IPE' steps per year that an employee has climbed. The IPE level of employees was not included in the original data set provided to us by Ericsson. Moreover, we needed IPE data going back to at least 1997 through 2001 to construct a reasonably robust 'rate of progress' variable. The integration of the IPE data into our data set was time-consuming and expensive since an Ericsson employee who could be trusted with these data had to construct promotion profiles for each individual in the database. In order to conserve on resources, these data were entered only for an 8% sub-sample of the full data set, randomly chosen, thus permitting us to test the potential explanatory power of the variable before committing more resources to data collection and entry for this variable.

The regression results for a sub-sample of 307 employees suggest that the IPE variable does not add to our ability to explain the allocation of stock options. The adjusted  $R^2$  is only 8.9%. The coefficient on IPE is negative and not statistically significant. Moreover, dropping CNGE, the coefficient of which is positive and statistically significant at the 1% level, from the model does not change this result. There is little correlation between CNGE and IPE. We decided, therefore that it was not worth the time and effort to collect IPE data for the whole dataset of 3782 employees.

#### Implications for understanding the evolution of Ericsson's stock option plans

The historical analysis that we carried out earlier in this paper suggests the Ericsson sought to use the 2001 and 2002 plans to manage the internal productive process in contrast to the 1999 and 2000 plans that were aimed at managing the external labor market. In the statistical analysis, we have asked on what grounds local managers allocated stock options among eligible employees (that is, pre-designated KCs). If successful, the quantitative analysis could tell us about the direction in which Ericsson's succession of stock option plans were moving in terms of the relative emphasis of the 'retention', 'motivation', and 'recognition' functions in the minds of local managers whose task it was to allocate options among KCs. The statistical results that we have generated for the 2001 plan on the basis of our 'three functions' model indicate that by 2001, in contrast to the stated purposes of the 1999 and 2000 plans, rationales other than 'retention' had come to the fore. This observation suggests that under the 2001 plan internal forces had become more prominent in the process whereby stock options were allocated to employees at Ericsson.<sup>13</sup>

As actual measures of the underlying phenomena that we are trying to capture that are based on the characteristics of individual option recipients, we have the most confidence in the MOTIVATION and RECOGNITION variables, although especially the motivation measure could be improved. The RETENTION variables based on a person's function do not capture variation in *individual* characteristics of employees *within a function* that may affect the differential potential of those individuals for interfirm labor mobility. More generally there is considerable variance in the allocation of options that is unexplained in these models. Moreover, the explanatory power of the model as well as the statistical impact of the different independent

variables on the allocation of options vary markedly across business units/divisions, as shown in the results obtained from the Model 2 regressions.

In the extreme, it may be that allocators did not have a 'three functions' model in mind, especially once they had already identified the pool of option recipients (as is the case in our study). It could be that, having been instructed to allocate the options that were budgeted to their units, they handed them out simply because it was a task that had to be done. In that case, it may be that a high level of unexplained variance is in fact an explanation of the true underlying 'model' of decision-making.

It may also be that the local managers who allocated options at the unit levels did so according to well-defined criteria that we have failed to capture in our models. In that case, an improvement of the statistical results would require a deeper understanding of allocators' motivations and behavior. Statistical analysis of the type that we have done here can serve as a point of departure for a systematic exploration of what alternative criteria allocators may have had in mind as well as how, with changes in the industrial, organizational, and institutional environment as well as their own individual learning processes, these criteria changed over time. To understand such behavioral changes and their impacts on allocation outcomes requires evolutionary analysis.

#### Adaptation of stock-based compensation to the Swedish business model

The sharp downturn in the global telecommunications industry in 2001 and 2002 had a dramatic impact on Ericsson. Revenues fell from just over US\$29 billion in 2000 to under US\$17 billion in 2002 (see Table 10). This 42% reduction in revenues was accompanied by an almost proportional decline in employment, as Ericsson cut its labor force by 40,500 in just 2 years. As can be seen in Table 10, Ericsson continued to downsize in 2003, with employment stabilizing in 2004 and 2005 at just under 50% of its level in 2000. Losses that totaled US\$5.7 billion in 2001–2003 were transformed into profits totaling US\$6.4 billion in 2004–2005.

In March 2003, after a 5-year experiment with different types of stock option plans, the Ericsson Board of Directors decided not to offer any new option plans. The Board viewed the returns on stock options as too dependent on the vagaries of the stock market; the plunge in Ericsson's stock price from a high of SEK165.20 on March 6, 2000 to a low of SEK3.37 on September 30, 2002 put all outstanding options well under water (see Appendix C). During March 2003, when the Board decided not to offer any new stock option plans, the price of Ericsson B stock did not rise above SEK6.30.

Since February 2002, however, Ericsson has had a stock purchase plan that Corporate HR has remodeled, in a distinctly 'Swedish' fashion, in effect to make up for the absence of a new stock option plan. The purpose of the February 2002 purchase plan was to give all Ericsson employees access to stock-based compensation, and not just high-level executives and those employees with KC status. The Ericsson stock purchase plan permitted any employee to designate up to 7.5% of his or her pay for the

**Table 10** Revenue, net income, net profit margin, and employment, Ericsson, 1996–2005

Year ending December 31	Revenue (US\$ mil.)	Net Income (US\$ mil.)	Net Profit Margin (%)	Employees
1996	18,291.0	1033.0	5.6	93,949
1997	21,219.0	1511.0	7.1	100,774
1998	22,760.0	1609.0	7.1	103,667
1999	25,267.0	1423.0	5.6	103,290
2000	29,026.0	2230.0	7.7	105,129
2001	22,117.0	−2029.0	—	85,000
2002	16,808.0	−2192.0	—	64,621
2003	16,366.0	−1507.0	—	51,583
2004	19,954.0	2876.0	14.4	50,534
2005	19,099.0	3059.0	16.0	51,742

Source: Hoovers.com.

purchase of Ericsson B shares at the prevailing market price. The company would then match every such share that an employee held for 3 years with one free share. In August 2003, the Board renewed this stock purchase plan (Ericsson, 2003b), and in August 2004 approved its transformation into the Long-Term Incentive Plan 2004, stating: ‘The Board of Directors is convinced that continuation of annual long-term incentive programs is essential to retain and in the future recruit key personnel and to develop conditions for the company’s future development and creation of value’ (Ericsson, 2004). LTI 2004 retains the one-plus-one share match for all Ericsson employees. Under this plan, however, KCs get two shares for every one they purchase and hold for 3 years, while 150 senior managers get a one-plus-four match and 50 top senior managers get a one-plus-six match. The extent of the match for the 200 senior managers depends on growth in earnings per share.<sup>14</sup>

Through this unique plan, therefore, Ericsson has continued its experiments with stock-based compensation in two ways. Firstly, the KC program, initially instituted as a basis for determining which employees would be eligible for stock options, became central to the distribution of rewards under the stock purchase plan. In the aftermath of stock options, Marcus Sheard viewed the KC program as a ‘modular instrument on which several different types of incentive programs can be combined regardless of whether they as based on options, stock or cash’ (interview with Marcus Sheard, Ericsson, June 19, 2006). Internal company records show that by 2002 the KC program played a role at Ericsson well beyond the determination of which employees would receive stock options. In a survey to which KCs responded, more than half stated that, as a consequence of their nomination to the KC program, they were awarded extra bonuses, made eligible for certain internal training programs, received cash rewards and base salary increases, and even job promotions (Ericsson, 2003a). Secondly, the structure of rewards in LTI 2004 is relatively egalitarian, especially when it is recognized that only the 200 senior executives are subject to a performance criterion to determine the number of matching shares that, after the 3-year holding period, they actually receive. Under LTI 2004 all employees have the right to purchase shares that, if

held 3 years, can generate at least a one-plus-one match. LTI 2004 is, therefore, both inclusive and relatively egalitarian; it is a stock-based compensation scheme that represents an adaptation to the Swedish business model.

How and to what extent this model has enabled Ericsson to manage the dramatic downturn and cutbacks of the early 2000s and re-emerge as a leading competitor in the global telecommunications equipment industry is a subject of our ongoing research. What is clear from our comparative research on the adoption of New Economy business practices by Old Economy companies in the telecommunications equipment industry is that the organizational structures of the leading North American companies, Lucent Technologies and Nortel Networks, were gravely damaged by the process whereas those of the leading European companies – not only Ericsson, but also Alcatel, Siemens, and Nokia – were not (Carpenter *et al.*, 2003). In contrast to their North American counterparts (as well as Marconi in the UK), the investment strategies and organizational structures of the continental European telecommunications equipment companies have been driven less by market forces and more by organizational imperatives over the past decade.

Our study of Ericsson suggests that a prime reason why the adoption of New Economy stock option plans did not undermine the organizational integrity of the Sweden-based company is because Corporate HR was able to transform the use of stock options from managing the labor market to managing the productive process. Ultimately what was important in this transformation was not the mode of compensation *per se*, but rather the designation of a sizeable minority of the labor force as KCs. By motivating and recognizing an elite group of employees, this organizational innovation may have added new vitality to the still egalitarian Swedish business model.

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### Notes

- 1 A stock option gives the employee who receives it the non-transferable right to purchase a share of the company for which he or she works at a pre-set ‘exercise’ price between the date the option ‘vests’ and the date it ‘expires’. Typically in US option grants, the exercise price is the market price of the stock at the date the option is granted; the vesting period is four years with 25% of the options vesting on the first, second, third, and fourth anniversaries of the date on which a block of options was granted; and the expiration date of an option is 10 years from the date of the grant. Unvested options usually lapse 90 days after termination of employment with the company. If

- the market price of the stock is well below the exercise price, the option is said to be 'under water'.
- 2 The predominance of Silicon Valley companies in the granting of non-executive stock options is clear from the locations of the headquarters of participants in the annual high-tech stock option surveys by Buck Consultants, which originated in 1996 as iQuantic (<http://www.mellon.com/hris>) as well as from controlled Factiva searches that the authors have done.
  - 3 We are grateful to Michael Bendorf of iQuantic, now Buck Consulting, for giving us access to these reports. Note that while Ericsson participated in the US iQuantic surveys in 2000–2003, it did not participate in the international surveys. Corporate HR, based in London and Stockholm, did not make use of iQuantic data in allocating options budgets to local managers (interview with Bo Ericsson, Ericsson, June 19, 2006).
  - 4 We gained valuable insights into these processes of change from a series of interviews with top human-resource executives at Alcatel, Ericsson, Sony, and STMicroelectronics during the first half of the 2000s. We have particularly benefited from discussions with Jean-Luc Corniglion at Alcatel and Marcus Sheard at Ericsson.
  - 5 The use of stock options as an alternative to cash salaries appears to be a phenomenon associated primarily with startups. There has been debate in the literature on whether *established* firms grant stock options to preserve cash. Core and Guay (2001) contend that they do, while Ittner *et al.* (2003) argue that cash-rich companies issue more employee stock options. See also Hall and Murphy (2003, 56) who argue that 'option-intensive companies like Microsoft, Intel, and Cisco are well-known for paying cash compensation above competitive levels, and Microsoft and others routinely use their excess cash to repurchase shares to reduce the dilution caused by large option grants.' Indeed, as Lazonick (2006b) shows, in the 2000s the extent of stock repurchases by these companies has gone beyond offsetting dilution to also include the objective of simply boosting their stock prices.
  - 6 Elsewhere, one of the authors (Lazonick, 2006b) has estimated that the *average actual gains* to Cisco employees (other than the five highest paid) from the exercise of stock options were as much as \$68,000 in 1995, \$106,000 in 1996, \$96,000 in 1997, \$103,000 in 1998, \$218,000 in 1999, and \$330,000 in 2000, before declining to \$127,000 in 2001, \$17,000 in 2002, \$11,000 in 2003; \$37,000 in 2004, and \$27,000 in 2005.
  - 7 On the negative impacts of stock options in a high-growth technology firm in the presence of volatile stock markets, see Welch, 2002.
  - 8 When the 1998 plan was implemented, the concept of market area corresponded to nations, but, as indicated in Appendix A, subsequently shifted to larger regions.
  - 9 'Ericsson acquires ACC to become a major player in carrier-class remote access,' Ericsson press release, September 8, 1998.
  - 10 Interviews with Marcus Sheard, Jessica Häggström, and Stefan Ärlund, Ericsson, February 19, 2004.
  - 11 For reasons of space, we have not included details of these regression results, as is also the case below when we exclude 4000+ recipients from the functional models based on business units or divisions.
  - 12 Only changes in statistical significance are reported here. In all three division/BU cases, the statistical significance of the other variables reported in Table 8 remained the same.
  - 13 Further proof of this hypothesis would require a replication of the statistical analysis for the 1999, 2000, and 2002, exercises

- that neither the quality of Ericsson's data nor our project's resources would permit. As for the statistical analysis of the 2001 plan that we have carried out, one can, in principle, separate out the proportions of the total variance explained by the RETENTION, MOTIVATION, and RECOGNITION variables, respectively, within upper and lower bounds (see, for example, Lazonick and Brush 1985, 83). But to engage in such an exercise would imply more precision in the statistical results that we have generated than is warranted by the robustness of our measures of retention, motivation, and recognition. We would prefer that the reader view the results of our statistical analysis as indicative rather than definitive.
- 14 For details of LTI 2004, see Ericsson, 2004: 'The terms of the additional performance match for senior managers are based on an average annual percentage growth rate in earnings per share ('EPS') between July 1, 2004 and June 30, 2007, with annualized first half 2004 EPS as the starting point. Maximum matching shares will be allocated if the average annual EPS growth is at or above 25 percent. No allocation of matching shares will occur if the average annual EPS growth is at or below 5%. Matching of shares between an average annual EPS growth 5 and 25% is linear.' In 2005 EPS was 38% higher than in 2004.

## References

- Bodie, Zvi, Robert Kaplan and Robert Merton, 2003, "For the last time: Options are an expense". *Harvard Business Review*, 81(3): 72–80.
- Carpenter, Marie, William Lazonick and Mary O'Sullivan, 2003, "The stock market and innovative capability in the New Economy: The optical networking industry". *Industrial and Corporate Change*, 12: 963–1034.
- Casper, Steven and Henrik Glimstedt, 2001, "Economic organization, innovation systems, and the Internet". *Oxford Review of Economic Policy*, 17: 265–281.
- Core, John and Wayne Guay, 2001, "Stock option plans for non-executive employees". *Journal of Accounting and Economics*, 61: 253–287.
- Ericsson, AB, 2000a, "Ericsson millennium stock option plan – summary, internal memo, March.
- Ericsson, AB, 2000b, "Key contributors directive", internal memo, CLO/DK, June 15.
- Ericsson, AB, 2001, "Individual distribution principles", internal memo, LME/DSK/K, March 21.
- Ericsson, AB, 2002, "Manager's check list", internal memo, LME/DK, Rev. A., October 10.
- Ericsson, AB, 2003a, "Manager's views on stock options". *Internal memo*. 2003-06-04.
- Ericsson, AB, 2003b, "The shareholder's meeting in Ericsson decided on transfer of own stock in relation to the Global Stock Incentive Program 2001", press release, April 8.
- Ericsson, AB, 2004, "The Ericsson Board of Directors proposes a Long Term Incentive Plan 2004 and transfer of own shares", press release, March 4.
- Glimstedt, Henrik and Udo Zander, 2003, "Sweden's wireless wonders: The diverse roots and selective adaptations of the Swedish Internet economy. In B. Kogut (ed.) *The global Internet economy*. Cambridge, MA: MIT Press, pp 109–151.
- Hall, Brian and Jeffrey Liebman, 1998, "Are CEOs really paid like bureaucrats?". *Quarterly Journal of Economics*, 113: 653–691.
- Hall, Brian and Kevin Murphy, 2003, "The trouble with stock options". *Journal of Economic Perspectives*, 17(3): 49–70.
- Ittner, Christopher, Richard Lambert and David Larcker, 2003, "The structure and performance of equity grants to employees of new economy firms". *Journal of Accounting and Economics*, 34: 89–127.
- Kedia, Simi and Abon Mozumdar, 2002, "Performance impact of employee stock options", AFA 2003 Washington, DC Meetings, January, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=304188#PaperDownload](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=304188#PaperDownload). accessed 17 September 2006.
- Lazonick, William, 2003, "Stock options and innovative enterprise: Evolution of a mode of high-tech compensation", INSEAD working paper, August.

- Lazonick, William, 2006a, "Evolution of the New Economy business model". In E Brousseau and N Curien (eds) *Internet and Digital Economics*. Cambridge: Cambridge University Press, pp 59–113.
- Lazonick, William, 2006b, "The US stock market and the governance of innovative enterprise", INSEAD working paper, August.
- Lazonick, William and Thomas Brush, 1985, "The 'Horndal effect' in early U.S. manufacturing". *Explorations in Economic History*, 22: 53–96.
- Liang, Nellie and Scott Weisbenner, 2002, "Who benefits from a bull market?", US Federal Reserve Board, Finance and Economic discussion series.
- Mamis, Robert, 1983, "Golden handcuffs". *Inc*, 5(8): 59.
- Mehran, Hamid and Joseph Tracy, 2001, *The impact of employee stock options on the evolution of compensation in the 1990s*. NBER working paper no. 8353, July.
- Murphy, Kevin, 2003, "Stock-based pay in new economy firms". *Journal of Accounting and Economics*, 34: 129–147.
- Oyer, Paul and Scott Schaefer, 2005, "Why do some firms give stock options to all employees?: An empirical examination of alternative theories". *Journal of Financial Economics*, 76: 99–133.
- Pearl Meyer and Partners, 2001, "Trends 2001: Looking forward and back <http://www.execpay.com/trends2001.htm>", accessed 5 October 2005.
- Sabow, Steven and Erin Milligan, 2000, "Trends in broad-based stock option plans". *Journal of Employee Ownership, Law, and Finance*, 12(2): 99–105.
- Sahlman, William, 2002, "Expensing options solves nothing". *Harvard Business Review*, 80(12): 90–96.
- Sesil, James, Maya Kroumova, Joseph Blasi and Douglas Kruse, 2002, "Broad-based employee stock options in US 'New Economy' firms". *British Journal of Industrial Relations*, 40: 273–294.
- Tainio, Risto and Kari Lilja, 2003, "The Finnish business system in transition: Outcomes, actors, and their influence". In B Czarniawska and G Sevón (eds) *The northern lights: Organisation theory in Scandinavia*. Copenhagen: Copenhagen Business School Press, 69–87.
- Uchitelle, Louis, 1990, "Unequal pay widespread in US". *New York Times*, August 14.
- Welch, Julia, 2002, "Stock-option cultures: Employee ownership in a high-growth software company". *Academy of Management Proceedings: H1-H6*.

## Appendix A

### Distribution of stock options by market area (Tables A1–A3)

**Table A1** Distribution of stock options at Ericsson, EMEA, and NA, 1998–2002

Plan	EMEA				NA			
	AE/EE (%)	AO/EO (%)	ASO/PSO (%)	ASO per AO	AE/EE (%)	AO/EO (%)	ASO/PSO (%)	ASO per AO
1998	72.2	80.0	67.4	5975	9.5	5.9	13.4	16,172
1999	68.6	68.8	62.4	1008	11.8	16.8	23.3	1538
2000	67.7	26.2	43.4	13945	12.8	67.3	48.0	6018
2001	71.3	54.2	56.4	2952	10.5	28.6	28.3	2804
2001 November	71.3	33.4	30.2	2191	10.5	43.0	52.8	2973
2002	73.8	68.1	65.8	4083	9.8	13.3	17.3	5489

Notes: EE = Ericsson employees (year end); EO = Ericsson optionees in plan; AE = area employees; AO = area optionees; PSO = stock options in plan; ASO = stock options allocated to area.

Market areas: EMEA = Europe, Middle East, and Africa; NA = North America; LA = Latin America; AP = Asia Pacific.

Source: Ericsson personnel files.

**Table A2** Distribution of stock options at Ericsson, LA and AP, 1998–2002

Plan	LA				AP			
	AE/EE (%)	AO/EO (%)	ASO/PSO (%)	ASO per AO	AE/EE (%)	AO/EO (%)	ASO/PSO (%)	ASO per AO
1998	7.6	4.9	6.4	9292	10.8	9.3	12.9	9826
1999	7.9	4.7	4.4	1047	11.6	9.7	9.9	1137
2000	8.0	1.7	2.7	13,235	11.5	4.7	6.0	10,643
2001	6.3	7.2	6.4	2492	12.0	10.0	8.9	2515
2001 November	6.3	6.4	5.2	1970	12.0	17.3	11.8	1655
2002	4.4	6.1	5.1	3527	12.0	12.6	11.9	3993

Source: Ericsson personnel files.

**Table A3** Distribution of stock options at Ericsson, Sweden, 1998–2002

Plan	SWEDEN			
	AE/EE (%)	AO/EO (%)	ASO/PSO (%)	ASO per AO
1998	43.0	58.5	38.0	4612
1999	42.1	44.9	36.4	901
2000	40.4	15.4	25.4	13869
2001	43.8	32.7	32.6	2819
2001 November	43.8	23.1	17.8	1860
2002	46.8	39.1	39.5	4274

Source: Ericsson personnel files.



## Appendix B

Detailed regression results (see Tables B1)

Table B1

Dependent variable	Number of stock options granted to an individual recipient			
	Model 1 (full data set)	Model 2(i) (GSM-TDMA-EDGE systems)	Model 2(ii) (mobile system)	Model 3(iii) (microelectronics)
(Constant)	1511.04*** (84.86)	1832.42*** (191.50)	1166.06*** (228.97)	658.95*** (199.61)
<i>Retention</i>				
FIN	759.68*** (127.78)	389.53* (219.64)	1298.66*** (339.68)	-105.27 (741.01)
HR	614.81*** (140.32)	-141.42 (279.10)	941.65** (414.01)	1125.34*** (350.12)
ISIT	693.74*** (154.24)	567.61* (293.53)	487.17 (355.83)	-382.72 (526.79)
MANU	1178.54*** (95.69)	1168.72*** (257.19)	1290.15*** (241.24)	3676.21*** (294.18)
MSPM	39.90 (75.19)	23.91 (169.04)	129.97 (206.28)	75.47 (150.12)
OPS	81.95 (123.71)	-319.35 (252.73)	426.89 (356.02)	34.01 (349.47)
R&D	165.29** (67.72)	-5.29 (149.328)	117.12 (183.19)	128.82 (137.50)
SASM	471.91*** (109.71)	662.93*** (233.71)	-101.25 (405.05)	1214.33*** (379.50)
<i>Motivation</i>				
CNGE	785.51*** (165.78)	-17.21 (343.70)	1103.80*** (193.01)	No CNGE recipients in microelectronics
<i>Recognition</i>				
Years	6.16** (2.69)	6.89 (5.80)	6.51 (6.39)	10.92 (7.56)
Closeness	410.92*** (41.85)	196.57** (86.41)	382.86*** (108.01)	317.43*** (121.15)
Gender	-85.65 (59.13)	-185.51 (135.27)	17.69 (135.99)	158.98 (161.28)
2000 Participant	6.32 (53.18)	330.33** (129.17)	163.94 (118.37)	-115.48 (130.99)
Adjusted R <sup>2</sup>	0.105	0.093	0.291	0.484
Observations	3782	647	330	192

Variable definitions:

(i) For definitions of FIN, HR, ISIT, MANU, MSPM, OPS, R&D, SSM, and OGA, see Table 7. FIN or HR or ISIT or MANU or MSPM or OPS or R&D or SSM = 1 if employee is in that function, otherwise 0. Omitted functional category: OGA.

(ii) CNGE = 1 if a Corporate Next Generation Executive, otherwise 0.

(iii) Years = number of years of service with the company.

(iv) Closeness = 1 if the nominator and reporting managers are the same person.

(v) Gender = 1 if male, 0 if female.

(vi) 2000 Participant = 1 if employee received options in 2000, otherwise 0.

SE are in parentheses. \* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level.

## Appendix C

### Gains from stock options at Ericsson

As of mid-September 2006 only options received from the 1998, 2001 November, and 2002 plans have yielded returns. With an exercise price of SEK39.92 and no vesting period (see Table 3), the 494 executives and experts who received option grants under the 1998 plan had the opportunity to reap gains as the Ericsson stock price rose to a peak of over SEK165 in early March 2000. If, for example, Sven-Christer Nilsson, the CEO and number one option recipient in 1998, had been able to wait to exercise his 40,130 options at the peak he would have gained just over SEK5 million (about US\$570,000). By that time, however, he was no longer CEO, and had left the company. More generally, if recipients had exercised their 1998 options at the peak, the extra income

on average for grantees based in Sweden would have been SEK577,000 (US\$65,500), in the US SEK 2,111,000 (US\$239,500); in Britain SEK 1,670,000 (US\$189,500); and in France (where there were two grantees) SEK 2,336,000 (US\$265,000). The subsequent broader based plans have been less lucrative. The 1999 and 2000 plans remain well under water. In late March 2006, Ericsson's stock price reached SEK30.50, its highest level in 4 years and just equal to the exercise price of options from the 2001 main plan, but it has subsequently declined. Options from the 2001 November plan, with an exercise price of 25.70, were in the money between July 6, 2005 and May 9, 2006, with the market price ranging from 25.90 to 30.50. If an option holder from this plan with an average option grant of 2489 had exercised all the options on March 30, 2006, when the



Ericsson stock price hit SEK30.50, the total gain would have been SEK11,947 (US\$1410). For those recipients of options under the 2002 plan who have stayed with the company long enough for their options to vest, there have been greater gains to be made. With an exercise price of SEK7.80, an employee who had been awarded the average number of options, 4224, under the 2002 plan and who exercised

options as they vested could have gained SEK6054 (US\$786) on November 11, 2003, SEK19,430 (US\$2810) on November 11, 2004, and SEK26611 (US\$3247) on November 11, 2005. On this basis, a recipient of 12,000 options – the maximum for non-executives under the 2002 plan – would have made a total of SEK147,997 or US\$19,400 when the options were fully vested and exercised.