Volume Title: Differences and Changes in Wage Structures

Volume Author/Editor: Richard B. Freeman and Lawrence F. Katz, Editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-26160-3

Volume URL: http://www.nber.org/books/free95-1

Conference Date: July 12-24, 1992

Publication Date: January 1995

Chapter Title: International Differences in Executive and Managerial Compensatio

Chapter Author: John M. Abowd, Michael Bognanno

Chapter URL: http://www.nber.org/chapters/c7853

Chapter pages in book: (p. 67 - 104)

2 International Differences in Executive and Managerial Compensation

John M. Abowd and Michael L. Bognanno

Every spring, as large American companies prepare for their annual shareholder meeting, executive compensation replaces income-tax returns as the topic of conversation around the lunch table and in the business press. The regularity of the phenomenon is related to the annual disclosure, in the proxy statements that accompany the annual reports usually published in March and April, of the compensation package earned by the five highest-paid employees of U.S. corporations. Because these reports must show the cash value of the capital gain associated with the exercise of stock options, they invariably contain some extremely large numbers. Furthermore, because the gains associated with the stock options have often accrued during the five to ten years that preceded the announcements, every year ushers in one or many cases of a chief executive officer (CEO) who has an exceptionally large income in a year in which the company has done poorly. In a book that touched off a firestorm around the issue of U.S. executive pay, Graef Crystal (1991, 1993) argued that the typical American chief executive was grossly overpaid and, worse, got there by the use of complicated long-term incentive compensation, including many

John M. Abowd is professor of labor economics and management at Cornell University and a research associate of the National Bureau of Economic Research. Michael L. Bognanno is assistant professor of economics at Temple University.

This paper was begun while Abowd was a visiting professor at the Institut National de la Statistique et des Etudes Economiques (INSEE) and the Ecole des Hautes Etudes Commerciales (HEC) in Paris. The research was partially supported by the Center for Advanced Human Resource Studies at Cornell University, the National Science Foundation (grant SES 91–11186 to Abowd), the NBER program "Differences and Changes in Wage Structures," and the Ministère de la Recherche et de la Technologie de la République Française. Francis Kramarz, Jean-Louis Lheritier, David Margolis, and Kevin J. Murphy provided helpful comments on earlier versions. The authors did not use confidential data in this paper. The data appendix and references show the authors' private and governmental source publications.

forms of stock options, that shareholders could not properly evaluate.[1] A central thesis of Crystal's book and the recent congressional and regulatory attempts to limit executive compensation is that American executives receive compensation that is far greater than that received by executives in comparable positions around the world.

Several authors, most notably Jensen and Murphy (1990a, 1990b), have argued that the debate over the level of CEO compensation is misguided because the form of the payment, specifically the sensitivity of total compensation to the performance of the firm, is more important than the level of pay. Jensen and Murphy show that U.S. CEO pay is not very sensitive to performance, although they note that the portion of pay delivered as restricted stock and stock options creates a portfolio whose increased value to the CEO is clearly related to the price performance of the firm's stock. In their extensive review of the pay-for-performance literature, Ehrenberg and Milkovich (1987) concluded that very few studies, including studies of CEO compensation, had established a clear statistical link between the structure of compensation and the performance of the firm.[2] While we agree that understanding the relation between compensation system design and firm performance is central to the study of CEO compensation, we also believe that a careful multinational comparison of the level and structure of executive pay and its evolution over time can inform the debate concerning the relative pay of American CEOs. Crystal's book does not contain detailed statistical comparisons. To the best of our knowledge, the only detailed statistical studies comparing executive compensation across many countries are those conducted by the large private compensation consulting firms, specifically the Hay Group, Hewitt Associates, Mercer International, Towers Perrin, and the Wyatt Company. These are our primary sources, and, except for Hewitt Associates, we have used data from each of these sources. Although we make a variety of statistical adjustments, as do the sources before they publish their results, it is clear that American CEOs do earn more than CEOs of comparably sized companies in other countries. It is also clear that the structure of the American CEO's compensation is quite different, being composed of a much larger long-term component. Other American executives, however, do not earn more than comparable executives in comparably sized companies around the world.

A careful international comparison of executive compensation and its rela-

1. *In Search of Excess* was originally published in 1991. The paperback edition, published in 1993, contains additional chapters that discuss the critiques of the hardback edition. Crystal was a professional executive compensation consultant before he retired to join the faculty of the University of California, Berkeley, business school as an adjunct professor.

2. Since their review was published, studies by Abowd (1990), Gerhart and Milkovich (1990), and Leonard (1990) and an additional review by Rosen (1990) have appeared. These newer studies estimated both an equation linking executive pay to firm performance and a second equation linking firm performance to the structure of executive pay. Although the results are mixed, these attempts to address both parts of the research question have focused scientific studies on the problem of efficient compensation system design rather than the level of pay.

tion to the compensation of ordinary employees could provide important evidence on the intercountry variation in CEO, high-level manager, and regular employee compensation. The quality of the conclusions drawn from such a comparison rests critically on the comprehensiveness of the compensation information and the thoroughness of the distinction maintained between employer cost and employee value. Comprehensive data are necessary because (1) total compensation costs include all cash disbursements to employees, voluntarily provided benefits, publicly mandated benefits, perquisites, and long-term compensation (multiyear bonus plans and stock-based compensation), (2) in different countries different parts of this compensation package are regulated with regard to funding or benefit formulas, and (3) there is substantial international variation in prices so that components delivered in kind in some countries can have a very different value than if they were delivered in kind elsewhere. Distinguishing between employer cost and employee benefit is necessary because (1) public funding of certain parts of the compensation package creates an explicit tax-and-transfer component to the mandatory benefits that is quite heterogeneous across countries and (2) many long-term compensation plans are worth less to the employee who receives them than they cost the employer to provide.[3]

In section 2.1 of this paper, we use public data from four different consulting firms and from the U.S. Bureau of Labor Statistics to illustrate the real level and evolution of employer total compensation costs for CEOs, top human resource directors (HRDs), and nonsupervisory manufacturing employees (called *operatives* below) for twelve OECD countries (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States) over the eight-year period from 1984 to 1992. Our findings are (1) that U.S. CEOs rank first in total real compensation cost all through the period, (2) that U.S. HRDs fall in rank from first to tenth between 1984 and 1992, and (3) that U.S. manufacturing operatives not only fall from first to tenth in rank but are the only employees in the survey to decline in total real compensation cost, stated in U.S. dollars. In section 2.2, we use published data from the OECD, national statistical agencies, and multinational accounting and consulting firms to construct a measure of after-tax constant purchasing power income that includes the value of privately consumed services supplied through the public sector. We call this measure the private *replacement value* of the compensation package. Unlike real total compensation costs, which reflect employer costs and vary as a function of both the compensation costs and exchange rates, our constant purchasing power replacement values reflect variation in consumer indirect utility. The two compensation measures, therefore, respond differently to the integration of world

3. We refer here to the riskiness of long-term compensation packages, which cannot be diversified like the other parts of executive wealth. Thus, we presume that either a total tax advantage (to the employer and employee jointly) or a productivity gain from the incentive nature of such compensation motivates its use.

markets. Increased integration of world product and capital markets, through factor price equalization, should tend to equalize real total compensation costs across countries for similar employees. On the other hand, increased integration of labor markets, through international migration, is required to equalize purchasing power parity adjusted replacement values. Section 2.3 examines the trends in both of our compensation measures and in the intercountry variation in these measures. We show that there has been a strong tendency toward equalization of the real total compensation costs but that no such tendency is evident for the replacement values.

In section 2.4, we examine some of the tax and institutional differences that may contribute to the American CEO's high total cost. We show that there are enormous differences in marginal tax rates, particularly marginal payroll tax rates, among our sample countries between high-level managers and manufacturing operatives. These high marginal tax rates have a depressing effect on CEO total compensation costs and replacement values but not on the costs or private replacement values of other high-level managers or manufacturing employees. In contrast, the ratio of either CEO or HRD compensation (or replacement value) to the comparable measure for manufacturing employees is very sensitive to differences in the marginal tax rates, indicating that the financing of certain programs through the public sector in some countries and through the private sector in others has a very important distorting effect on the wage structure, particularly at the high end. In this section, we also show that American managerial pay is more sensitive to the size of the company managed than is managerial pay in any of the European countries in our sample (comparable data for Canada and Japan were not available). The tax rate differences and the differential sensitivity of pay to the size of the firm are two important factors in explaining the high pay of American CEOs. Unfortunately, we cannot find an explanation for the big differences in long-term pay between American and other CEOs. We show some evidence that the incidence of stock option compensation is increasing in several of our European countries and that estimates of zero incidence rates for such compensation are probably not correct. We also show that there are no longer serious legal restrictions to stock-based compensation in any of our sample countries and that in some of those countries such compensation enjoys a tax advantage. We cannot explain why only U.S. CEOs seem to have received such large long-term compensation plans, and we speculate that a more integrated world labor market for executives, coupled with the absence of currency and stock ownership regulation, may foster an increase in the stock-based long-term component of non-U.S. executives' compensation.

2.1 Real Total Compensation Costs

Real total compensation cost is the total cost to the firm associated with maintaining an employee, stated in 1990 U.S. dollars. Total compensation consists of the sum of base salary; annual bonus monetary compensation; all bene-

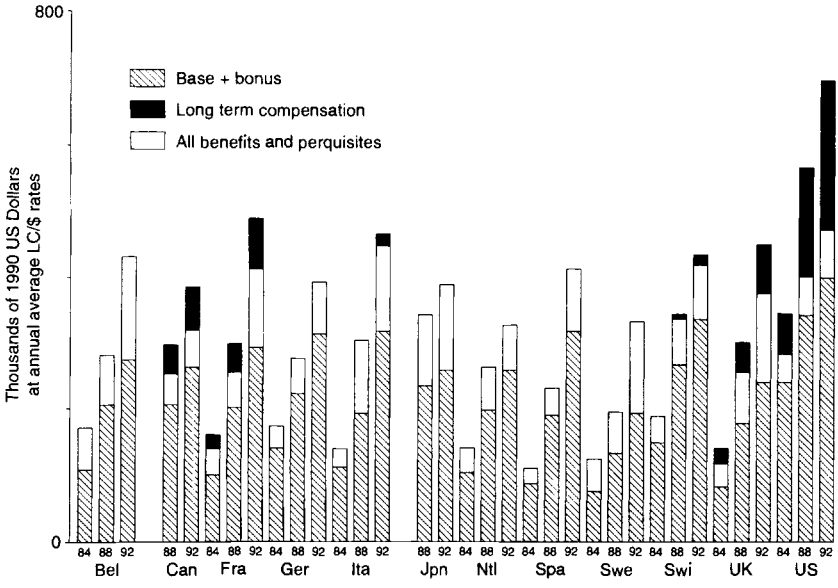

Fig. 2.1 Real total compensation of CEOs, by components, 1984–92

fits, payments in kind, and perquisites; and all long-term monetary compensation. Base salary (or base pay for manufacturing workers) is all cash compensation set in advance and payable throughout the year. The annual monetary bonus is all additional cash compensation based on annual performance evaluations. Benefits, payments in kind, and perquisites consist of all costs associated with providing a service or retirement income to an employee. We distinguish between voluntary benefits, which are provided by an employer but not required by law, and publicly mandated benefits, which are provided either by the employer or by the government and are financed by a tax on employment such as a payroll tax. The cost of voluntary benefits is the employer's expense in providing the benefit. The cost of mandatory benefits is the sum of the employer expense in providing the benefit and the mandatory tax payments. The cost of long-term compensation is the annuity equivalent of the present value of awards that accrue over a period exceeding one year.[4] Forms of long-term compensation include stock-based compensation, such as stock option plans, and multiyear bonus plans.

Figure 2.1 shows the real total compensation cost of the CEO in three components—base salary plus annual bonus, all benefits and perquisites, and long-

4. All long-term compensation comes from the Towers Perrin surveys cited in the data appendix. Towers Perrin estimates the present value of long-term compensation on the date of award using a variety of economic models for the cash flows, including option pricing formulas and pro forma business simulation. The annuity equivalent is calculated using the usual interval between awards so that, if a company awards stock options, e.g., every three years, the present value of any given option award is converted to a three-year annuity equivalent.

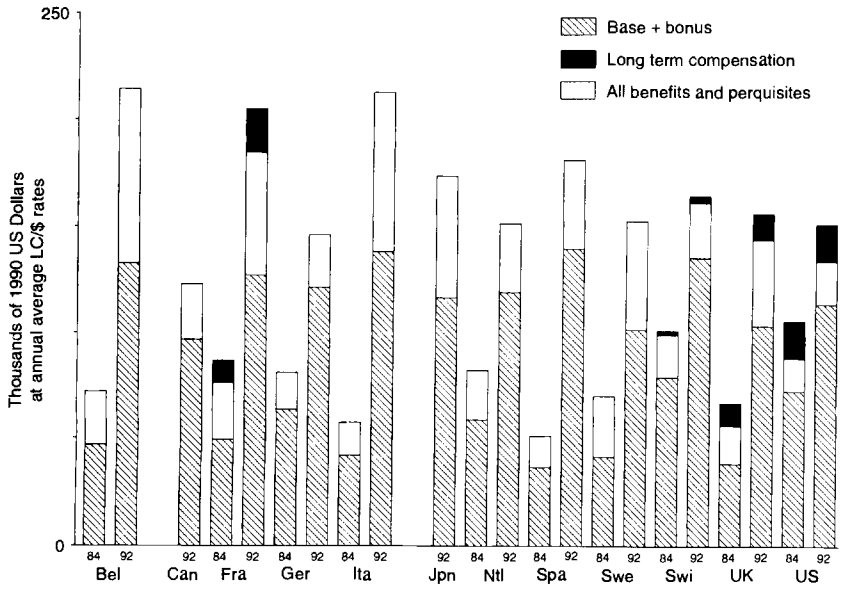

Fig. 2.2 Real total compensation of HRDs, by components, 1984–92

term compensation—for the three years 1984, 1988, and 1992 and for all twelve countries.[5] Compensation is stated in thousands of 1990 U.S. dollars using annual average exchange rates and the U.S. consumer price index. Across countries, an increasing trend in the level of total compensation cost for CEOs is evident. The trend results from general growth in all three compensation components. The total compensation cost of U.S. CEOs is far higher than that of foreign CEOs in each of the three years, in large part because of much higher amounts of long-term compensation, but also because U.S. CEOs receive the highest base salaries and annual bonus payments. We note that U.S. CEOs maintain their absolute edge over foreign CEOs in real total compensation cost despite the weakening of the dollar between 1984 and 1992. The weakening of the dollar vis-à-vis other currencies causes the compensation costs of other countries to rise when expressed in terms of U.S. dollars.[6]

Figure 2.2 shows the real total compensation cost of the top human resource

5. In this section and the next, we present figures comparing our various compensation measures for the years 1984 (the earliest year available), 1988 (the sample midpoint), and 1992 (the latest year available) in all twelve of our countries. The data selected for the figures is a subset of the data used in the statistical analyses of sec. 2.3 below. We tried to minimize problems of comparability by selecting two managerial occupations (CEO and HRD) for which we had reasonably complete data from comparable sources. Thus, the compensation data shown in the figures have not been statistically adjusted to account for differences in sources or average firm size.

6. Although this remark is equally applicable to the real total compensation costs in fig. 2.1, fig. 2.2 below (for HRDs), and fig. 2.3 below (for manufacturing operatives), the real exchange rate effects in figs. 2.2 and 2.3 are much more apparent. Exchange rates provide the correct notion of employer cost; nevertheless, the data appendix provides in figs. 2A.1, 2A.2, and 2A.3 a comparison of total compensation costs adjusted using OECD annual average purchasing power parity rates.

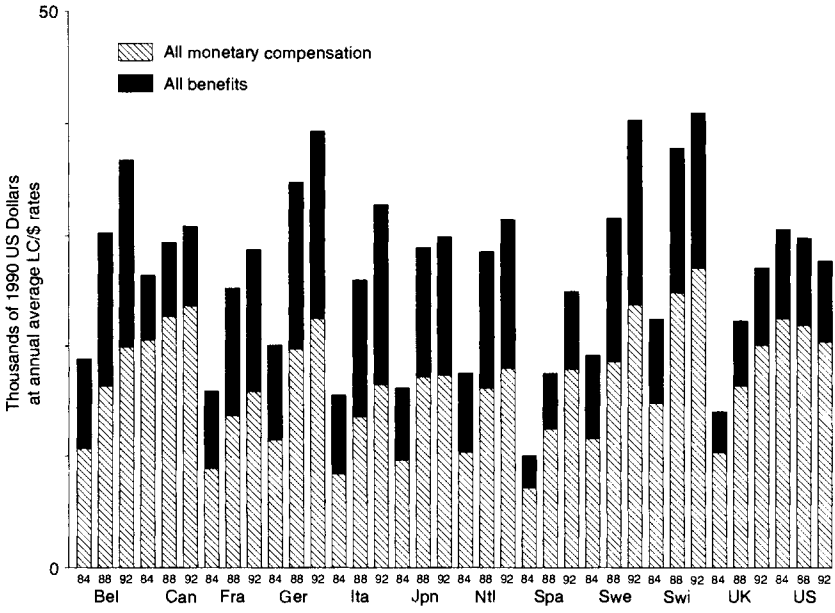

Fig. 2.3 Real total compensation of manufacturing operatives, by components, 1984–92

directors divided into the same three components as for the CEOs. Compensation is again expressed in thousands of 1990 U.S. dollars at annual average exchange rates. The total compensation cost is rising markedly for HRDs between 1984 and 1992 in each country. In contrast to the experience of U.S. CEOs, however, U.S. HRDs fell, relative to the HRDs of the other countries, in total compensation cost from first in 1984 to tenth by 1992. The rate of increase in real U.S. dollar total compensation cost for HRDs was much greater outside the United States.[7]

Figure 2.3 shows the real total compensation cost of a production manufacturing employee in two ways: total monetary compensation and all benefits and perquisites. Long-term compensation (except for pensions, which are included in benefits) is not an important part of manufacturing operative income. Compensation is stated, again, in thousands of 1990 U.S. dollars at annual average exchange rates. We note a strong upward trend in real total compensation costs for all but U.S. manufacturing operatives. A global real exchange rate adjustment of the dollar relative to other currencies, which occurred during the 1980s, is the apparent cause of this trend. Although U.S. CEOs maintained their top ranking in compensation cost and U.S. HRDs fell in ranking but still experienced a real increase in compensation cost, the compensation cost of

7. We show results only for the years 1984 and 1992 in fig. 2.2 because none of our data sources provided an estimate for a human resource director in 1988.

U.S. manufacturing operatives declined in rank from first to tenth over the period and actually fell in real terms—the only position and country combination to fall in real total compensation cost in our entire sample.

2.2 Private and Public Compensation at Constant Purchasing Power

Private and public compensation at constant purchasing power, which we call the private replacement value of the compensation package, is the after-tax value to the employee of all privately and publicly provided compensation and benefits stated in 1990 OECD dollars using the OECD annual average purchasing power parity (PPP) exchange rates. Thus, the private replacement value of the compensation package represents the minimum expenditure at international prices required to replace the utility level associated with the goods and services provided publicly and privately to an employee earning the typical compensation package in the country.

We have paid careful attention to the value of benefits whether privately or publicly financed or provided because for international compensation comparisons it is important to account for the significant differences among the countries in the system of financing and delivering benefits. Some countries finance most of the benefit package through a maze of payroll taxes, while consumers purchase the benefits themselves on the open market, and a semipublic agency then reimburses them. In other countries, the employer supplies the benefits as compensation in kind. In still other countries, consumers purchase and finance certain services, considered employment benefits elsewhere, wholly outside the employment relation. In addition to benefits consumed currently by the employees, the countries in our sample differ markedly in their systems for financing and delivering retirement income. In several countries (Belgium, France, Italy, and Sweden, in particular), the public pension system represents both a significant employment cost and a direct public benefit even for CEOs. In order to compare the real after-tax and public benefit incomes of managers and workers in our twelve countries, therefore, we undertook a detailed analysis of the public benefit packages in each country.

We define the private replacement value of a compensation package as the sum of base salary, annual bonus, voluntary benefits, publicly provided (mandatory) benefits, perquisites, long-term monetary compensation, and all public and private pension benefits less employee payroll and income taxes. We then divide this quantity, stated in local currency, by the product of the 1990-based OECD purchasing power parity exchange rates and the OECD index of consumer prices (1990 = 1.00). Thus, our measure controls for local differences in the prices of both publicly and privately supplied goods and services.

We valued base salary, annual bonus, voluntary benefits, perquisites, and long-term monetary compensation at employer cost. Therefore, the before-tax amount is identical to the amount that we used in the employer cost calculations above. We computed the value of publicly provided (mandatory) benefits

by taking the sum of a country's expenditures on social protection programs, dividing this sum by the population of the country, and multiplying by four, thus assuming that the employee had a family of four. We valued public and private pension benefits by computing the projected retirement benefit on the basis of survey estimates of the percentage of final salary and bonus paid as a public or private pension at age sixty-five. We computed the present value of the pension at retirement assuming an expected remaining life of fifteen years (at 2 percent real interest). Finally, we converted this sum to an annuity equivalent over a forty-year working life (again at 2 percent real interest). To estimate employee payroll and income taxes, we used survey estimates and direct calculations from simplified summaries of the relevant tax schedules. Income taxes assumed a family of four including two children. For source details, see the data appendix.

For our measure of public benefits, we considered government spending on nine types of social protection, as classified by Eurostat—sickness, invalidism, employment-related injury or disability, maternity, family assistant plans, job training and placement, unemployment benefits, housing subsidies, and miscellaneous social programs. For the countries of the European Community, the social protection expenditure data came directly from Eurostat. We note, for completeness, that Eurostat also reports government current expenditures on old-age and retirement income systems, but we used our own measures of the replacement value of the pension income. For the other countries, we list below the expenditure categories from the country's statistical abstract, which we compared with the Eurostat categories.

For Canada: Sickness included all government health expenditures. Invalidism was included in the category of sickness. Employment injury included provincial workers' compensation. Maternity was included in family assistance. Family assistance included all Canada assistance plans, family allowances, and other provincial welfare programs. Job training and placement included Canada job strategies. Unemployment benefits included federal unemployment insurance. No expenditures were included under housing subsidies. And miscellaneous social programs included registered Indians' and veterans' benefits, vocational rehabilitation of disabled persons, state tax credits and rebates, and municipal social security.

For Japan: Sickness included all medical care expenditures paid directly by the government, the old-age insurance system, or the national insurance system (these expenditures include invalidism expenditures). Employment injury and disability expenditures included the benefit amounts paid for workers' compensation claims. Family assistance included net expenditure on social welfare. No expenditures were included under maternity. Job placement and training included employment services expenditures. Unemployment benefits included total allowances paid under general employment insurance. Housing subsidies included housing aid. And no expenditures were included under miscellaneous.

For Sweden: Sickness included expenditures for sickness and disease. No expenditures were included under invalidism. Employment injury included occupational industry insurance and industrial safety. No expenditures were included under maternity or job training and placement. Family assistance included family and child welfare expenditures. Unemployment benefits included all unemployment insurance system expenditures. No expenditures were included under housing. And miscellaneous included veterans' care.

For Switzerland: Sickness included total public expenses on health care less administrative expenses. Invalidism included total expenses on invalid care less administrative expenses. Employment injury included all expenses, cost of treatment, daily indemnities, invalid premiums, and survival pay. No expenditures were included under maternity. Family assistance included cantonal and federal aid to families. No expenditures were included under job training and placement. Unemployment included total expenses related to unemployment. And no expenditures were included under housing subsidies or miscellaneous social programs.

For the United States: Sickness included federal and state expenditures on Medicare, hospital, medical care, other health and medical programs, and veterans' health and medical programs. Invalidism was included in sickness. Employment injury included state temporary disability insurance. All workers' compensation, state and federal, and state temporary disability insurance. Maternity assistance consisted of maternal and child health programs. Family assistance included public assistance, state and federal; Supplemental Security Income, state and federal; and food stamps. Job training and placement included other state and federal employment training programs and other public employment aid. Unemployment benefits included unemployment insurance; employment services, state and federal; and other railroad unemployment insurance. Housing subsidies included housing expenditures, state and federal. And miscellaneous included all other public welfare programs.

The importance of controlling for differences in publicly provided benefits may not be obvious for a study of executive and managerial compensation. To illustrate the importance of these differences, we selected health care costs, a benefit that is quite significant in U.S. compensation systems, to illustrate the international contrasts. Table 2.1 shows medical and health care expenditures for all OECD countries (the twelve we study and the remaining twelve, for which we have insufficient executive compensation data to use in our other statistical analyses). The table illustrates that, when valued at international prices, U.S. expenditures are higher per capita (col. A) but a lower percentage of GDP (col. C for 1990 and col. D for 1985) than the OECD average. On the other hand, U.S. health care prices are 24 percent above the international average (col. B). Of our sample countries, the French spend the most per capita (in real terms), and the Japanese have the lowest health care prices. For comparison purposes, we include a column (col. E) showing the percentage of health purchases made in the private as opposed to the public sector. Our

Table 2.1 Medical and Health Care Expenditures in the OECD

Country	(A) 1990 Real Health Care Expenditures per capita	(B) 1990 Health Price Index	(C) 1990 Health Percentage of GDP	(D) 1985 Health Percentage of GDP	(E) 1990 Private Percentage of Health
Belgium	1,796	79	9.7	9.3	92.7
Denmark	1,153	139	6.0	5.3	15.0
France	2,499	83	12.7	10.0	68.7
Germany	1,799	113	8.7	8.3	95.1
Greece	502	61	6.0	4.8	51.7
Ireland	835	100	6.9	6.1	28.0
Italy	1,526	91	8.4	6.0	54.1
Luxembourg	1,349	87	6.2	5.1	88.1
Netherlands	1,452	93	8.1	7.9	100.0
Portugal	618	58	6.2	4.4	35.3
Spain	820	80	6.2	4.7	45.7
United Kingdom	1,314	75	7.3	6.6	21.6
EEC	1,559	90	8.8	7.4	67.0
Austria	1,544	94	8.2	8.1	32.7
Switzerland	1,554	151	7.2		81.9
Finland	1,280	145	6.8	7.4	30.0
Iceland	1,461	130	7.8		13.5
Norway	1,560	121	8.6	8.3	37.2
Sweden	1,774	127	9.2	11.1	11.9
Turkey	178	34	3.4	2.9	66.3
Australia	1,296	99	7.1	5.8	57.9
New Zealand	1,201	77	7.8	6.6	55.8
Japan	1,722	70	8.6	10.2	93.6
Canada	1,587	99	7.3	3.1	32.8
United States	1,820	124	7.5	7.6	91.5
OECD	1,563	100	8.0		78.0

Sources: Purchasing power parities and real expenditures for 1990 are from Volume 1 EKS Results 1990 (OECD 1992d) Tables 1.1, 1.3 and 1.6. Purchasing power parities and real expenditures for 1985 are from OECD (1987b, table 3).

Note: 1990 real health care expenditures per capita (col. A) are stated in U.S. dollars using the OECD purchasing power parity price indices. The health price index (col. B) is relative to the OECD, which has a value of 100. 1990 and 1985 health percentages (cols. C and D) are stated at OECD average prices. Columns A–D include private and public expenditures.

method of controlling for the public and private benefit packages has the effect of counting as an employment cost the employer's expenditures on health care and the taxes (regardless of statutory incidence) that support the financing of both the private and the public components of the health care expenditures in a given country. Similarly, our method of computing the private replacement value of health care benefits counts the employer's direct expenditures, government reimbursements of private expenditures, and direct public expenditures. Finally, the use of the OECD purchasing power parity exchange rates controls

for the enormous differences in local relative prices. Although not as detailed as the health care cost analysis shown here, our benefit valuation method provides essentially the same comprehensive measurement of sources and prices for unemployment insurance, pensions, and other social welfare benefits as the table 2.1 comparison provides for health costs.

Figure 2.4 shows the CEO's private and public compensation package in OECD dollars at average annual OECD purchasing power parity rates. The figure has three components for each year and country entry. The component labeled *private net compensation* is base salary, annual bonus, voluntary benefits, perquisites, and long-term monetary compensation less employee payroll and income taxes; hence, this component is, essentially, after-tax total private compensation. The component labeled *public benefits* is the per capita expenditure on all public benefits except pensions times four, plus the annuity equivalent of the projected public pension. The component labeled *all payroll and income taxes* equals payroll taxes (employer and CEO parts) plus the CEO's personal income taxes.

In the figure, the portion of each bar above zero shows the CEO's replacement value of public and private compensation and benefits in constant purchasing power (at OECD average prices). The two components of the positive part of each bar show the division of the replacement value between private after-tax compensation and public benefits. It is important to notice that, for countries like France, Italy, and Sweden, the public portion of the benefit package is a significant part of the CEO's compensation, as reflected in our measure of the replacement value. The portion of each bar below zero shows the amount of all payroll and income taxes. While the size of public benefits differs across countries, differences in payroll and income taxes, both in absolute size and in proportion to private net compensation, dwarf this variation. Heavier proportional tax burdens are weakly linked to larger public benefits, even for the CEO. The replacement value of public and private compensation and benefits for U.S. CEOs increased in real terms more than that of non-American CEOs. The high and increasing real standard of living of the American CEOs is due to higher before-tax compensation, lower effective taxes, and lower prices for goods and services.

Figure 2.5 shows the top human resource director's private and public compensation package. U.S. HRDs rank first in the replacement value of compensation in both 1984 and 1992. However, the differences between the HRDs are small, especially in comparison to the differences among the CEOs. Although U.S. HRDs rank tenth in compensation costs to their employers in 1992, they rank first in replacement value, by a slim margin, because of low taxes and low relative prices in the United States.

Figure 2.6 shows a manufacturing employee's private and public compensation package for our twelve countries. U.S. manufacturing operatives are near the middle of the pack in the replacement value of their compensation. While low prices in the United States raised the ranking of U.S. manufacturing opera-

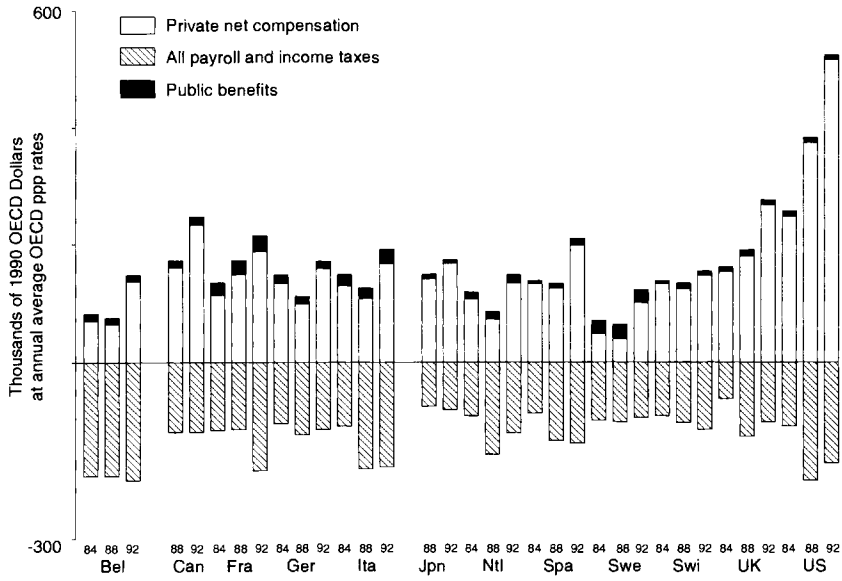

Fig. 2.4 Total taxes, private after-tax compensation, and public benefits for CEOs, 1984–92

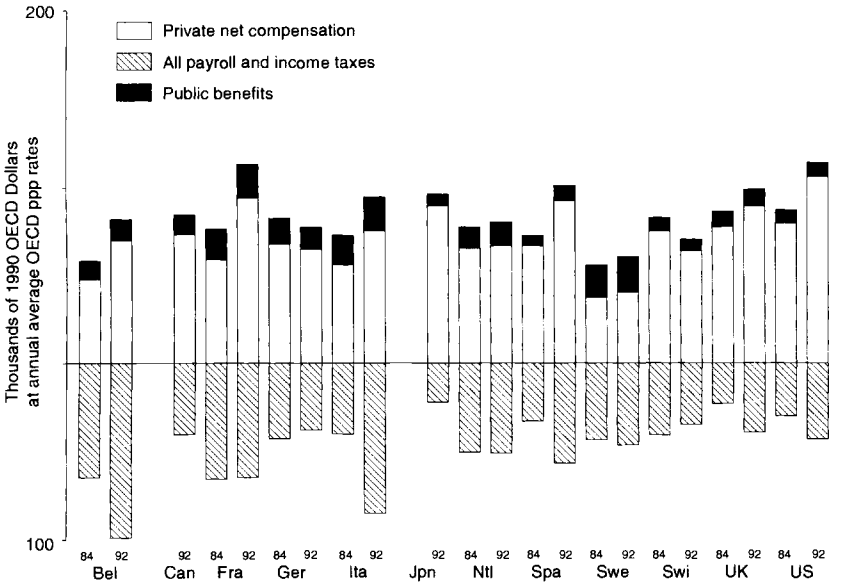

Fig. 2.5 Total taxes, private after-tax compensation, and public benefits for HRDs, 1984–92

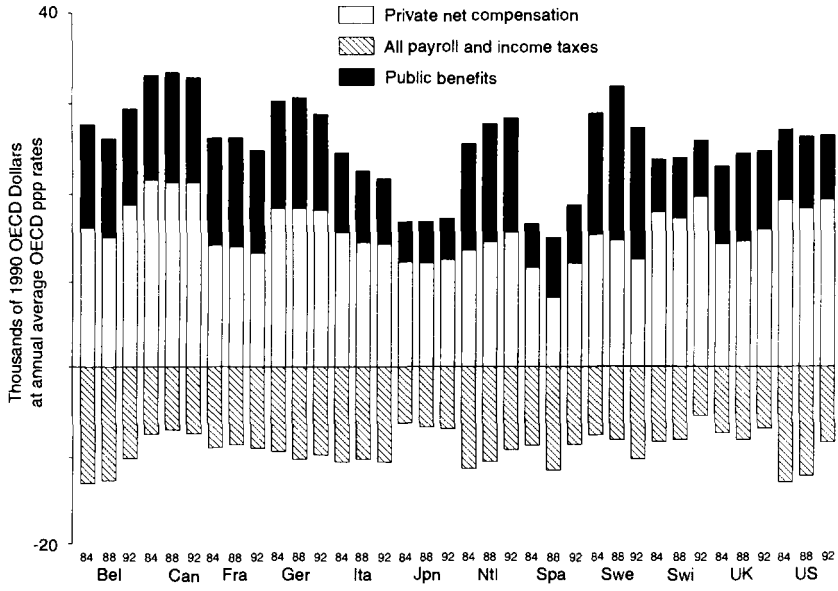

Fig. 2.6 Total taxes, private after-tax compensation, and public benefits for manufacturing operatives, 1984–92

tives from tenth in terms of total compensation cost in 1992 to sixth in terms of replacement value, the lighter tax burdens seen in the case of U.S. CEOs and HRDs are not evident for U.S. manufacturing operatives. Considering all countries together, the manufacturing operatives have not made the gains in replacement value seen among the HRDs and CEOs during the sample period.

2.3 Statistical Analysis of Total Compensation Cost and Replacement Value

In this section, we conduct a variety of statistical analyses using all our executive compensation data to show the basic trends in compensation of CEOs, high-level managers, and manufacturing operatives. We extracted the basic executive compensation data from surveys conducted by Arthur Young, the Hay Group, Towers Perrin, and the Wyatt Company. Survey data apply to the years 1984 and 1988–92. A source had to include information for at least three-fourths of our countries in order to enter the sample. The complete list of compensation sources is given in the data appendix.

Table 2.2 presents a basic regression analysis of the levels of three different compensation measures and two different methods of standardizing across countries. For compensation measures, we considered (*a*) total compensation, defined as the sum of base salary, annual monetary bonus, voluntary benefits, compulsory benefits (employer payroll taxes), perquisites, and long-term mon-

Table 2.2 **Regression Analysis of the Logarithms of Several Real Compensation Measures**

Compensation Measure and Independent Variable	Log of Real Measure ($U.S.)			Log of PPP Measure (OECD)		
	CEO	High-Level Manager	Manufacturing Operative	CEO	High-Level Manager	Manufacturing Operative
A. Total compensation						
Overall trend	.125	.011	.085	.025	−.084	−.002
	(.011)	(.047)	(.012)	(.014)	(.055)	(.008)
U.S. incremental effect	.816	.383	.482	.536	.016	.302
	(.139)	(.219)	(.196)	(.180)	(.257)	(.130)
U.S. incremental trend	−.048	−.052	−.087	.022	.026	−.017
	(.023)	(.032)	(.034)	(.029)	(.038)	(.023)
Marginal employee income tax rate + marginal payroll rate	−.339	.244	−.234	−.512	.069	.124
	(.096)	(.169)	(.189)	(.124)	(.198)	(.126)
Marginal corporate income tax rate	.160	.464	.391	−.040	.518	.112
	(.204)	(.316)	(.360)	(.263)	(.370)	(.240)
R^2	.853	.706	.598	.675	.215	.201
Standard error of equation	.150	.208	.550	.193	.243	.135
Error degrees of freedom	73	57	42	73	57	42
B. Replacement value						
Overall trend	.116	.025	.089	−.025	−.070	.002
	(.025)	(.043)	(.016)	(.028)	(.046)	(.012)
U.S. incremental effect	.891	.443	.272	.601	.075	.092
	(.180)	(.202)	(.267)	(.198)	(.216)	(.205)
U.S. incremental trend	−.055	−.063	−.071	.016	.015	−.001
	(.029)	(.030)	(.047)	(.031)	(.032)	(.036)
Marginal employee income tax rate + marginal payroll rate	−.895	−.271	−.272	−1.077	−.445	.087
	(.145)	(.156)	(.258)	(.159)	(.167)	(.199)

(*continued*)

Table 2.2 (continued)

Compensation Measure and Independent Variable	Log of Real Measure ($U.S.)			Log of PPP Measure (OECD)		
	CEO	High-Level Manager	Manufacturing Operative	CEO	High-Level Manager	Manufacturing Operative
Marginal corporate income tax rate	.193	.398	.432	.060	.453	.153
	(.296)	(.292)	(.491)	(.325)	(.311)	(.378)
R^2	.873	.735	.457	.784	.368	.021
Standard error of equation	.186	.192	.277	.204	.302	.213
Error degrees of freedom	49	57	42	49	57	42
C. Base + bonus or salary						
Overall trend	.141	.023	.091	.041	−.072	.003
	(.019)	(.044)	(.011)	(.013)	(.049)	(.009)
U.S. incremental effect	.741	.334	.630	.461	−.033	.450
	(.137)	(.209)	(.182)	(.167)	(.230)	(.160)
U.S. incremental trend	−.063	−.053	−.094	.008	.025	−.023
	(.023)	(.031)	(.032)	(.027)	(.034)	(.028)
Marginal employee income tax rate + marginal payroll rate	−.380	−.118	−.772	−.553	−.292	−.364
	(.095)	(.161)	(.176)	(.115)	(.177)	(.155)
Marginal corporate income tax rate	.330	.422	−.038	.130	.477	−.317
	(.201)	(.301)	(.335)	(.245)	(.332)	(.294)
R^2	.836	.741	.680	.646	.317	.395
Standard error of equation	.148	.198	.189	.180	.218	.323
Error degrees of freedom	73	57	42	73	57	42

Note: The table shows the estimated coefficients (with standard errors) from ordinary least squares regressions. Regressions for the CEO include variables indicating the data source and the average size of a company. Regressions for the high-level manager include the average size of a company in the survey. Panel C contains regressions analyzing the base plus bonus for the CEO and high-level manager and analyzing cash compensation for the manufacturing operative. The variable labeled *marginal payroll tax* is the employee plus the employer marginal payroll tax rate.

etary compensation, as discussed in section 2.1; (*b*) replacement value, defined as the sum of base salary, annual monetary bonus, voluntary benefits, perquisites, and public benefits (family of four) less employee payroll taxes and personal income taxes (family of four), as discussed in section 2.2; and (*c*) base salary plus annual monetary bonus, a conventional measure. To standardize for price differences we used (1) real U.S. dollars (i.e., compensation stated in local currency divided by the product of the average annual exchange rate [local currency per dollar] and the U.S. consumer price index [1990 = 1.00]) and (2) OECD purchasing power parity dollars (i.e., compensation stated in local currency divided by the product of the OECD purchasing power parity rate [local currency per dollar, 1990 based] and the OECD index of consumer prices [1990 = 1.00]).[8]

Panel A of table 2.2 shows our statistical analysis of total compensation. Real total compensation of CEOs grew rapidly over the eight-year period from 1984 to 1992 (a logarithmic trend of .125 with a standard error of .011). U.S. CEOs were paid more (incremental logarithmic effect of .816 with a standard error of .139), but the U.S. trend was lower than in the other countries (incremental logarithmic trend of −.048 with a standard error of .023). We defer the discussion of tax rate effects until the next section. High-level managers' real total compensation did not grow (an overall trend of .011 with a standard error of .047). For the high-level managers, the U.S. total compensation is insignificantly different from the average, and the incremental trend is negative, meaning that U.S. managers' total compensation grew more slowly than the average of the twelve countries. For manufacturing operatives, real total compensation grew rapidly, but not as fast as for CEOs, over our sample period (overall trend of .085 with a standard error of .012). U.S. manufacturing operatives had higher real total compensation (U.S. incremental effect of .482 with a standard error of .196); however, the U.S. trend for manufacturing operatives was negative and fully offset the overall trend (a U.S. incremental logarithmic trend of −.087 with a standard error of .034). The table also shows these analyses in terms of local purchasing power. Using the OECD purchasing power parity rates, the relative position of U.S. CEOs, high-level managers, and manufacturing operatives is unchanged; however, there are no significant trends, either overall or incrementally for the United States, when the purchasing power parity adjusted measure of total compensation cost is used.

Panel B of table 2.2 shows our statistical analysis of the replacement value of compensation (for the definition, see sec. 2.2). Consider first the purchasing power parity results shown in the rightmost three columns of the table. These results use the OECD deflator that we also used to calculate the replacement values shown in section 2.2. There was no significant overall trend in the replacement value of compensation for any of the three positions during the sam-

8. The dollar was chosen as the unit of account for this analysis, but the OECD purchasing power parity rates have the property that they are invariant with respect to the unit of account.

ple period. U.S. CEOs, however, had a higher replacement value than their non-American counterparts (a U.S. incremental effect of .601 with a standard error of .198). Neither high-level managers nor manufacturing operatives in the United States had higher replacement values than elsewhere. The U.S. trend was not different from the overall trend for any of the three positions.

The table also shows the regression analysis of the replacement value of compensation as measured in real (1990) U.S. dollars in the leftmost three columns of panel B. Stated in terms of U.S. dollars, the CEOs and manufacturing operatives both had positive upward trends (overall trends of .116 and .089 with standard errors of .025 and .016, respectively). In addition, measured in 1990 U.S. dollars, both U.S. CEOs and high-level managers had higher replacement values (U.S. incremental effects of .891 and .443 with standard errors of .180 and .202, respectively). On the other hand, measured in U.S. dollars, the U.S. replacement values were declining relative to the other eleven countries for all three positions (see the negative U.S. incremental trend coefficients). One should take caution in drawing conclusions from the replacement value comparisons when stated in 1990 U.S. dollars. Because we used the average annual exchange rate and the U.S. consumer price index in this calculation, comparisons of these replacement values presume that the individual employees could purchase private and public goods and services at U.S. prices, which is clearly not the case. For comparisons of replacement values, we prefer the results based on the OECD purchasing power parity rates.

Panel C of table 2.2 presents the regression analysis of base salary plus annual monetary bonus (cash compensation for the manufacturing operative). This is a commonly used, although flawed, measure of pay. In terms of 1990 U.S. dollars (the leftmost three columns of panel C), we note that the overall trend was positive for CEOs and manufacturing operatives but not for high-level managers. The United States had higher base plus bonus for the same two positions. The U.S. incremental trend, however, was negative, canceling about half the gain for CEOs and all the gain for manufacturing operatives. In terms of OECD purchasing power (the rightmost three columns), CEOs had a slightly positive upward trend, while the overall trend for the other two positions was not significantly different from zero. U.S. CEOs and manufacturing operatives had higher base plus bonus than their non-American counterparts. Finally, in terms of purchasing power, the U.S. incremental trend was not significantly different from zero for any of the positions.

We next consider two hypotheses concerning the integration of the product, capital, and labor markets among our twelve countries. Product and capital market integration alone is sufficient, under very general conditions, to equalize the employer cost of labor. That is, increased product or capital market integration should be associated with smaller intercountry differences in the real total compensation costs. By contrast, integration of the labor markets, including the possibility of intercountry mobility, is required to reduce the differences across countries in the constant purchasing power replacement value

of the compensation package. Table 2.3 addresses these questions directly. We compute the adjusted intercountry variance of real total compensation and replacement value at purchasing power parity for each of our sample years.[9] For all three positions (CEOs, high-level managers, and manufacturing operatives), the variance of real total compensation declined substantially over the sample period. Since the period from 1984 to 1992 represented one of increased goods flows between these countries and substantial real exchange rate adjustments, we believe that the decline in the variance of real total compensation costs represents some evidence that the prices of these three types of labor are more similar now than at the beginning of the 1980s, as predicted by factor price equalization. Conversely, there is no downward movement in the variances of replacement value at purchasing power parity over the same time period. Since the labor markets of these countries have not become more integrated over this time period (with the possible exception of the European Community countries), it is not surprising that we find no evidence of the variance reductions that labor mobility might have induced.

Many of the discussions of U.S. CEO pay have focused on the ratio of CEO base plus bonus to manufacturing annual earnings (see, e.g., Crystal 1991). We believe that our two compensation measures (total compensation cost and replacement value) provide a more complete picture of the relative position of CEOs and high-level managers as compared to manufacturing production employees. Figure 2.7 shows the following ratios: CEO total compensation to manufacturing total compensation, CEO replacement value of compensation to manufacturing replacement value, HRD total compensation to manufacturing total compensation, and, finally, HRD replacement value to manufacturing replacement value. Whether measured from the employer or employee perspective, the ratio of American CEO compensation to that of manufacturing operatives is clearly much larger than the ratios in the other eleven countries. For HRDs, however, the American ratios are about average as compared to the ratios in the other eleven countries.

Table 2.4 contains a statistical analysis of these pay ratios. Panel A of table 2.4 analyzes the ratios for total compensation. For CEOs, the overall trend in the ratio of their total compensation to that of manufacturing operatives is positive (a logarithmic trend of .034 with a standard error of .013), while the overall trend for high-level managers is insignificantly different from zero. For both CEOs and high-level managers, neither the U.S. incremental effect nor the U.S. incremental trend is statistically significant. We discuss marginal tax rate effects in the next section. Panel B shows the analysis of replacement values relative to manufacturing employees. None of the overall trends is statistically

9. The regression equation, whose residuals were used to compute these variances, included a complete set of year indicators (for all positions), indicators for the source of the data (CEOs only), and indicators for the position (high-level managers only). A separate equation was fit for each position.

Table 2.3 **Trends in the Intercountry Variance of Total Compensation and Replacement Value, 1984–92**

	1984	1988	1989	1990	1991	1992
Real total compensation:						
CEO	.0863	.0834	.0614	.0517	.0436	.0378
High-level manager	.0486				.0263	.0256
Manufacturing employee	.0774	.0375	.0332	.0315	.0241	.0252
Replacement value at PPP:						
CEO	.1068	.1970			.1239	.1319
High-level manager	.0204				.0434	.0353
Manufacturing employee	.0415	.0532			.0351	.0328

Note: Reported variance is the average squared residual by year from a regression including a complete set of year indicators (all rows), indicator variables for the source (CEOs only), and indicator variables for the position (high-level managers only).

different from zero. U.S. CEOs, however, had a higher ratio than their counterparts elsewhere (a U.S. incremental effect of .681 with a standard error of .351). The U.S. incremental trend is not statistically different from zero.

To complement our analysis of the compensation levels and ratios, we consider in table 2.5 some differences in the structure of the CEO and HRD compensation for ten of our twelve countries.[10] Consider first the effects of company size. We adjusted our own statistical analyses, discussed above, for differences in the average size of the company responding to the source survey. However, we note that U.S. base salaries are more sensitive to company size than are the base salaries in other countries, as shown in the first two columns of table 2.5.[11] One source of the larger U.S. salaries that appear in unadjusted comparisons is clearly the differential size effect in the United States compared to other countries. Another potential difference between U.S. and other executive compensation systems is the use of stock-based long-term compensation. We consider this in more detail in the next section. We note that, according to Wyatt surveys, stock options, the most common long-term compensation plan in the United States, appear common in Europe. Incidence rates for stock options are shown in the fourth column of table 2.5. There is a problem, however, with using these estimates of the stock option incidence rates. The source for table 2.5 (the Wyatt Company) pools salary responses for U.S. expatriates, other expatriates, and home country nationals in its executive compensation survey.[12] Therefore, the stock option incidence rates in the fourth column are

10. The data in table 2.5 come exclusively from Wyatt sources, which did not contain comparable data for Canadian and Japanese firms.

11. We believe that this statement is also true for total compensation, but we do not have the data with which to confirm this suspicion.

12. Arthur Young, the principal source for 1984, also includes expatriates in its survey. Towers Perrin, the principal source for 1988–90 and one of several sources for 1991 and 1992, includes only home country nationals in its worldwide compensation survey.

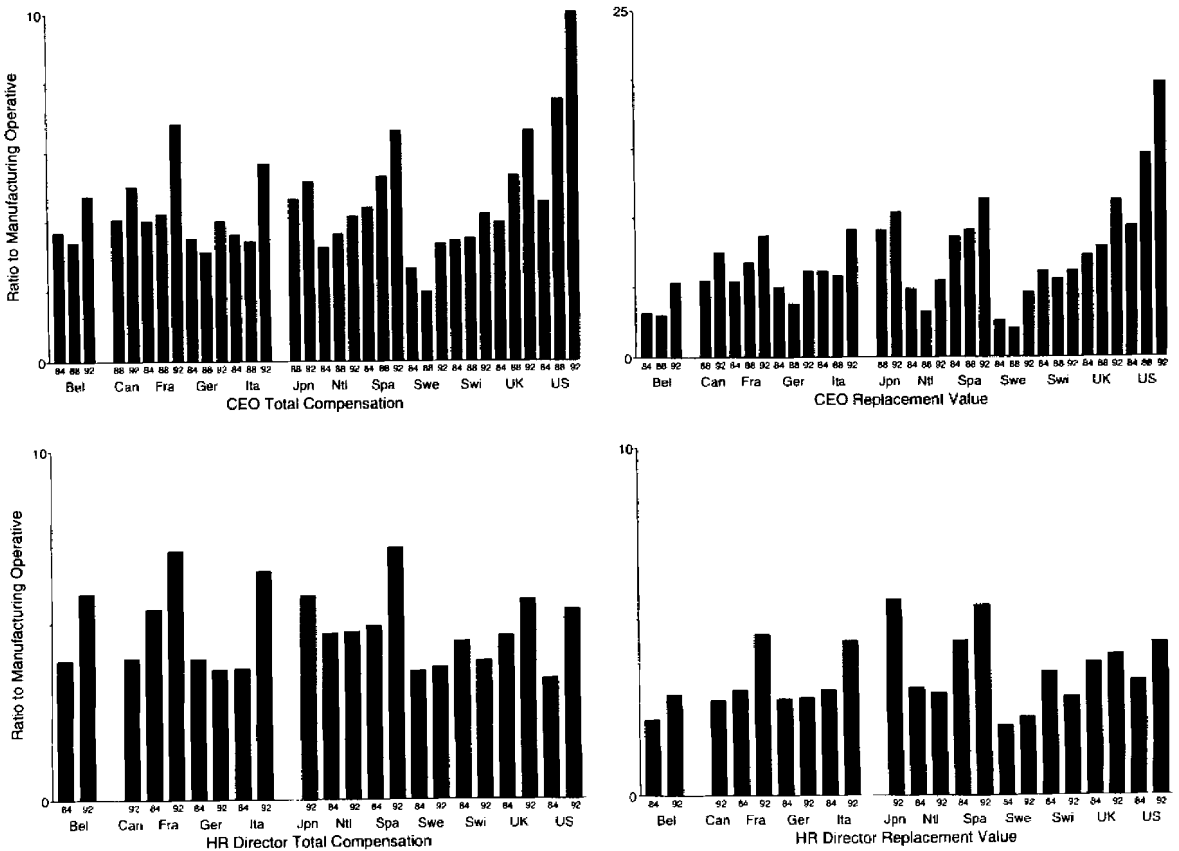

Fig. 2.7 Ratio of CEO and HRD total compensation and replacement value to that of manufacturing operative, 1984–92

Table 2.4 **Regression Analysis of the Ratio of Compensation of Managers to Manufacturing Operatives**

Compensation Measure and Independent Variable	Log of Compensation Ratio	
	CEO	High-Level Manager
A. Total compensation relative to manufacturing operative		
Overall trend	.034	.014
	(.013)	(.014)
U.S. incremental effect	.306	−.235
	(.219)	(.268)
U.S. incremental trend	.043	.036
	(.035)	(.040)
Marginal employee tax rate − manufacturing operative marginal rate	−.363	−.403
	(.168)	(.188)
R^2	.518	.181
Standard error of equation	.230	.257
Error degrees of freedom	51	59
B. Replacement value relative to manufacturing operative		
Overall trend	.027	.005
	(.021)	(.017)
U.S. incremental effect	.681	.087
	(.351)	(.326)
U.S. incremental trend	.023	.015
	(.056)	(.048)
Marginal employee tax rate − manufacturing operative marginal rate	−.702	−.559
	(.269)	(.229)
R^2	.445	.165
Standard error of equation	.368	.312
Error degrees of freedom	51	59

Note: The table shows the estimated coefficients (with standard errors) from ordinary least squares regressions. Regressions for the CEO include indicators for the data source. Data are for the years 1984, 1988, and 1992 only. The marginal employee tax rate is the marginal personal income tax rate plus the sum of the marginal employee and employer payroll tax rates.

contaminated by the relatively high representation of U.S. expatriates in the sample (shown in the fifth column). One solution to this problem is to estimate the stock option incidence rate for each country assuming that the home country nationals have a zero incidence rate and that the U.S. expatriates have the rate shown in the U.S. row of the table. The final column of the table makes this calculation. In every country except for the United Kingdom, the estimated stock option incidence rate in the final column is lower than the actual survey

Table 2.5 **Some Characteristics of the Wyatt Executive Compensation Sample**

Country	CEO Sales Elasticity	HRD Sales Elasticity	Company Sales ($U.S.)	% CEOs Awarded Options	% American Expatriates	CEOs Options if National Rate = 0 (%)
Belgium	.089	.087	157	22	52	19
France	.108	.084	110	26	63	23
Germany	.093	.070	306	24	33	12
Italy	.104	.166	114	26	56	20
Netherlands	.057	.032	95	30	56	20
Spain	.056	.045	194	24	54	20
Sweden	.157	.150	343	42	68	25
Switzerland	.059	.043	128	30	42	15
United Kingdom	.124	.078	130	23	65	24
United States	.219	.207	511	36		

Source: Wyatt Co. (1992b).

Note: Sales elasticity is from the regression of log base salary on log sales. Comparable data for Canada and Japan were not available.

rate (fourth column), indicating that either U.S. expatriates receive stock options more often than their U.S. counterparts (which is unlikely) or that the foreign national stock option incidence rate is above zero.[13] This conclusion is particularly important for countries like Germany and Sweden where popular discussions of the compensation packages assert that the long-term component of compensation is zero.[14]

2.4 Tax and Institutional Differences between Countries

In the descriptive analyses of sections 2.2 and 2.3, we noted (1) that differences in long-term compensation are very important between the United States and the other countries in our study and (2) that marginal tax rates appear to be related to all our measures of compensation. In this section, we explore these issues in greater detail. With respect to tax effects, we show (1) that top personal marginal income tax rates have become lower and more equal over our sample period, (2) that top marginal payroll tax rates (employer plus employee parts) have remained very unequal, with no change in the level for executives, (3) that marginal income tax and payroll tax rates for manufacturing

13. Charterhouse (1989, 1991) estimates show that U.K. CEOs receive stock options at a rate exceeding the Wyatt estimate and that this rate grew over the 1980s.

14. Our own figs. 2.1 and 2.2 above show no long-term compensation for Belgian, German, Japanese, Dutch, and Swedish executives. The value of the long-term component of compensation in these countries was estimated from Towers Perrin sources. Towers Perrin excludes all expatriates from its *Worldwide Remuneration* surveys. Thus, for the Wyatt and Towers Perrin estimates of long-term compensation incidence rates to be consistent for Germany and Sweden, it must be the case that other European expatriates account for the positive stock option incidence rates in these countries.

employees have increased and become more unequal, and, finally, (4) that marginal overall tax rate differences are strongly related both to the levels of total pay and to the ratios of executive/managerial pay to the pay of manufacturing operatives. With respect to the differences in long-term compensation, we examine both the tax-favored and the non-tax-favored forms of stock-based compensation in all twelve of our countries. Although many countries limit or refuse favorable tax treatment of stock options, they are, nevertheless, legal in all twelve of our countries. Consequently, it is difficult to explain why executives in other countries receive far less of this kind of compensation, especially since the disclosure requirements in other countries are generally not as restrictive as those in the United States.

Define the marginal tax rate on personal income as the tax due from a one-unit increase in taxable personal income. Define the marginal tax rate on corporate income as the tax due from a one-unit increase in taxable corporate income. Let the marginal employer payroll tax rate be the payroll tax due from the employer from a one-unit increase in base salary. Finally, define the marginal employee payroll tax rate as the payroll tax due from the employee from a one-unit increase in base salary.[15] Table 2.6 shows our estimates of these marginal tax rates based on the sources discussed in the data appendix for 1984 and 1992. The columns labeled *both payroll taxes* show the sum of the employer and employee marginal payroll tax. For the executive employees, marginal personal income tax rates declined in every country in the sample (as did top corporate rates, also shown, for most countries). At the same time, marginal personal income tax rates for the manufacturing employees do not show a clear trend between the two years. As regards marginal payroll tax rates, the sum of the employer and employee top marginal rates was virtually unchanged for the executives but rose substantially for the manufacturing employees.

Variability in the marginal personal income tax rates and in the marginal payroll tax rates (sum of employer and employee parts) is not matched by equivalent variability in the level of public benefits provided to executives as opposed to manufacturing employees. The distortion induced in the wage structure of our sample countries from the heterogeneous marginal tax rates coupled with the heterogeneous benefit schedules is evident in the regression analyses shown in tables 2.2 and 2.4 above. In table 2.2, we note that the marginal employee income tax rate plus the marginal payroll rate (sum of employer

15. For clarity, we note that *payroll tax* is an American business term. In international English, these are often called *mandatory employer and employee contributions*, which depend on compensation (salary, annual bonus, other cash payments, the taxable part of voluntary benefit packages, the taxable part of perquisites) and not directly on family or personal revenue subject to income tax. A payroll tax is a deductible business expense for the employer and, generally but not always, deductible for the employee. The French terms are *cotisations patronales* (employer) and *salariales* (employee). The German terms are *Gesetzliche Arbeitgeberbeiträge* (employer) and *Arbeitnehmer* (employee). The Italian terms are *contributi obbligatori a carico dell'azienda* (employer) and *dipendente* (employee). The Japanese terms are *kaisha no hōteikyo shukkin* (employer) and *jūgyōin no hōteikyo shukkin* (employee).

Table 2.6 **Summary of Marginal Tax Rates for Corporate Income Tax, Personal Income Tax, and Payroll Taxes in 1984 and 1992**

Year and Country	Corporate Income Tax	Executive Employee		Manufacturing Employee		Difference between Executive and Manufacturing
		Personal Income Tax	Both Payroll Taxes	Personal Income Tax	Both Payroll Taxes	
1984:						
Belgium	.45	.72	.48	.33	.35	.52
Canada	.46	.52	.00	.14	.13	.25
France	.50	.65	.21	.15	.45	.26
Germany	.63	.56	.00	.19	.40	−.03
Italy	.46	.71	.07	.18	.38	.22
Japan	.56	.78	.01	.21	.22	.37
Netherlands	.48	.72	.00	.16	.58	−.02
Spain	.35	.66	.00	.19	.35	.12
Sweden	.52	.70	.36	.15	.30	.62
Switzerland	.31	.46	.10	.21	.21	.14
United Kingdom	.52	.60	.00	.30	.25	.05
United States	.55	.62	.00	.16	.27	.19
Average	.48	.64	.10	.20	.32	.22
1992:						
Belgium	.39	.59	.40	.32	.61	.06
Canada	.44	.49	.00	.26	.19	.04
France	.37	.57	.21	.07	.68	.03
Germany	.59	.53	.00	.19	.57	−.23
Italy	.48	.51	.06	.23	.72	−.39
Japan	.52	.65	.01	.20	.35	.12
Netherlands	.35	.60	.00	.25	.57	−.23
Spain	.35	.53	.00	.23	.46	−.16
Sweden	.30	.49	.36	.34	.51	.01
Switzerland	.31	.50	.12	.06	.31	.24
United Kingdom	.35	.40	.10	.26	.29	−.04
United States	.40	.42	.00	.17	.35	−.11
Average	.40	.52	.11	.22	.47	−.05

Source Note: Corporate marginal income tax rates are for undistributed income as reported by Price Waterhouse (1984, 1992). Marginal tax rates for executives are for the CEO in the Arthur Young (1985) survey using the tax schedules in Price Waterhouse (1984) and the CEO in the Towers Perrin (1992) survey using tax schedules therein. Marginal tax rates for manufacturing employees are for the BLS manufacturing employee using tax schedules in Price Waterhouse (1984) Wyatt (1992a), and Price Waterhouse (1992). The column labeled *difference between executive and manufacturing* is the difference between the sum of the two executive marginal tax rates shown and the two manufacturing rates shown.

and employee parts) is strongly negatively related to CEO compensation regardless of the measure chosen. For the other high-level executives, there is some evidence of a negative relation between marginal employee tax rates and compensation (primarily for the replacement value measures), but not as strong as for the CEO. Conversely, the marginal employee tax rate (including both parts of the payroll taxes) has a significant negative effect on manufactur-

ing compensation only when we use base salary plus annual monetary bonus as the compensation measure. These results suggest that the public financing and supply of benefits serves to depress the compensation of CEOs and, to a lesser extent, high-level executives but serves only to change the form of manufacturing compensation from private to public benefits.

Table 2.4 confirms this conclusion by showing that the ratio of both CEO and high-level manager compensation (either total compensation or replacement value) to manufacturing operative compensation exhibits a strong negative relation to the difference between the marginal employee tax rates (personal income tax rate plus the sum of employer and employee payroll tax rates). The final column of table 2.6 shows that this difference in marginal tax rates declined markedly over our sample period. Consequently, although there is no overall trend toward higher ratios of executive to manufacturing compensation, the strong negative trend in differential marginal tax rates was associated with a pronounced increase in these ratios; that is, the trend toward greater executive to manufacturing operative pay is entirely "explained" by the downward trend in differential marginal tax rates. As it becomes legally possible to deliver higher executive standards of living through the compensation system, it appears that executive pay increases relative to manufacturing pay regardless of the cultural environment.

Turning now from tax effects on total compensation and replacement value to tax effects on long-term compensation, we try to explain why stock-based compensation is less common in all our sample countries as compared to the United States. Unfortunately, the answer is not as apparent as in the case of the effects of changes in the tax structures on total compensation measures. Table 2.7 shows the legal status of tax-favored and non-tax-favored, stock-based long-term compensation plans in all our countries.[16] Such compensation is legal in all twelve countries. In addition, most of the countries have some form of tax-favored scheme, although these schemes are often limited with respect to the size of the tax benefit. Furthermore, plans resembling U.S. nonqualified stock option plans, which were not designed to be tax favored but which do have a tax advantage whenever individual marginal tax rates (the sum of the marginal personal income tax rate, the employer marginal payroll tax rate, and the employee marginal payroll tax rate) exceed corporate marginal income tax rates or whenever individual marginal tax rates are likely to fall in the future, would be similarly tax advantaged in every country we studied except the Netherlands and Sweden. Table 2.6 shows that both the conditions for a tax

16. A compensation plan is tax favored if it results in lower total tax payments, i.e., if the present value of corporate income taxes plus personal income taxes plus all payroll taxes is lower than would result from an equivalent amount of total compensation delivered using salary instead of long-term compensation. The tax-favored status of the plans shown in table 2.7 depends on the deductibility of the compensation expense from taxable corporate income. For all countries shown in the table (except the United States), the expense associated with the stock-based compensation is a legal employment expense and would, thus, be deductible; however, the tax guides do not confirm this directly.

Table 2.7 **Summary of Employee Tax Treatment of Long-Term, Stock-Based Compensation Plans**

Country	Tax-Favored Long-Term Compensation and Restrictions	Ordinary Long-Term Compensation and Recent Legal Changes
Belgium	SOs: G is TE when XN per year does not exceed the lesser of BEF 500,000 or 25% of EE's normal salary. $X \geq S(0)$. $H \geq 2$.	Other SOs: G taxed as EI. Passage of the 1984 Fiscal Recovery Act created tax favored SOs.
Canada	SOs: 25% of G is TE when $X \geq S(0)$, remainder taxed as EI.	Other SOs: G taxed as EI. 1988–89 33% of G was TE, and 50% of G was TE in 1987.
France	SOs: G is TE when $H \geq 1$ and $(R + H) \geq 5$.	Other SOs: G taxed as EI. Restrictions on foreign companies offering SOs to French residents were removed in 1986.
Germany		SOs: G taxed as EI. However, if $R \leq 9$ months, $G = [S(0) - X]N$.
Italy		SOs: G taxed as EI. Security regulations were relaxed in 1988.
Japan		SOs: G taxed as EI. Japanese firms are generally prohibited from acquiring their own stock. EE stock association groups must be set up to acquire stock in order to permit EEs to exercise their SOs. Although these associations are independent, they are funded by the company and EE contributions.
Netherlands	SOs: 7.5% of S(0)N taxable as EI in year of grant. G is TE if $X \geq S(0)$ and $R \leq 5$. If SO is not exercised, there is no refund of tax at grant.	Other SOs: same tax system applies; however, the percentage of S(0)N that will be taxed as EI in the grant year must be negotiated with Dutch tax authorities.
Spain	SOs: G taxed as CG, which is adjusted for holding period and inflation before the EI rates are applied, if EE was charged for the option.	Other SOs: G taxed as EI if the SO was granted at no charge to the EE, as is typical in an American compensation SO.
Sweden	Convertible debenture: Fair market value of the convertible debenture is S(0)N. If EE buys debenture for S(0)N, then 60% of the gain at the exercise of the conversion provision, $[S(1) - S(0)]N$, is TE. If EE pays less than fair market value, say, PN, then $[S(0) - P]N$ is taxable immediately as EI, and 60% of	SOs are taxed as EI when granted. Taxable EI is the difference between the fair market value of the SO and the price paid by the EE at the grant, say ZN. At exercise no taxable income is recognized. When the stock is sold, the gain on sale $[S(1) - X]N - ZN$ is taxable as CG. (Note that S(1) refers to the stock

(*continued*)

Table 2.7 (continued)

Country	Tax-Favored Long-Term Compensation and Restrictions	Ordinary Long-Term Compensation and Recent Legal Changes
	[S(1) − S(0)]N is TE. H ≥ 2. Other variations are possible.	price at sale of the stock and not at exercise in this case.) There are some restrictions on Swedish companies granting stock options that can be circumvented by the use of parent companies and independent stock option funds. Prior to 1989 exchange controls effectively prohibited stock option plans by non-Swedish companies.
Switzerland		SOs: G taxed as EI.
United Kingdom	SOs: G and subsequent stock price appreciation taxed as CG when the shares are sold, not at exercise. 3 ≤ R ≤ 10, minimum 3-year interval between exercises, and the value of shares underlying the SOs must not exceed the larger of 4 times an EE's earnings or £100,000.	Other SOs: G is taxed as EI. If R < 7, taxable income may be recognized on the grant date. Legislation in the late 1970s and early 1980s promoted EE stock ownership.
United States	Incentive stock options (ISOs) are not taxed until the EE sells the shares. If R ≥ 2 and H ≥ 1, G plus the price appreciation on the stock since exercise is taxed as CG. Compensation expense of G is not tax deductible for the employer.	Other SOs: Nonqualified plans have G taxed as EI. ISOs are not automatically tax favored because of the loss of the employer's tax deduction on the compensation expense.

Sources: Primarily William H. Mercer International and Arthur Anderson & Co. (1990), with supplemental information from other tax sources listed in the data appendix.

Note: BEF = Belgian francs. S(0) = market price of share at grant. S(1) = market price of share at exercise. X = exercise price of option. N = number of shares optioned. G = [S(1) − X]N. H = number of years shares are held after the exercise of the options. R = number of years the options are held after the grant. SOs = stock options. EE = employee. TE = exempt from employee income and payroll taxes. EI = employment income (called *earned income* in the United States). CG = long-term capital gain.

advantage from non-tax-favored stock option compensation held for all our sample countries except Germany over the period 1984–92. Thus, we might expect that German, Dutch, and Swedish CEOs would have less stock-based compensation for purely tax reasons. For the other countries, however, stock options should have been at least as attractive a form of compensation for CEOs as they were in the United States. We cannot explain why among non-Americans only Canadian, French, Italian, Swiss, and British CEOs have any

stock-based compensation. We also cannot explain why the proportion of stock-based long-term compensation is not higher in these countries, although we note that France and the United Kingdom have very strong positive trends for long-term compensation.

2.5 Conclusion

In this paper, we have analyzed the total compensation of chief executive officers, high-level managers, and manufacturing operatives from twelve OECD countries over the period 1984–92. American CEOs are clearly the highest paid whether we measure compensation from an employer cost viewpoint or from an individual replacement value viewpoint. American high-level managers, on the other hand, receive compensation that is on par with their counterparts in the other eleven countries. We identified three important factors related to the higher compensation of U.S. executives. First, the U.S. tax system favored direct compensation as opposed to unmeasured perquisites relative to the compensation systems of the other countries. The negative relation between marginal tax rates and total compensation (either measure) establishes this effect. As marginal tax rates of executives increase as compared to those of ordinary employees, a country's compensation structure becomes more compressed; that is, the ratio of executive compensation to manufacturing operative compensation declines. An international trend toward lower top-end tax rates, therefore, contributed to an increase in executive pay relative to that of manufacturing operatives. The second factor contributing to the difference between U.S. CEOs and others is the large component of long-term compensation that they receive. CEOs in other countries are much less likely to receive stock-based compensation even when the same tax incentives exist to use such remuneration. Although we can document the differences in the institutional environments across our sample countries, we cannot explain why companies outside the United States do not use stock option compensation more extensively. The third factor affecting U.S. executive compensation relative to other countries is the relatively low price of goods and services in the United States as compared to the other OECD countries. Purchasing power adjusted comparisons, particularly using the replacement value of the compensation package, thus, accentuate U.S. differences, whereas exchange rate–adjusted comparisons, particularly over the period 1984–92, tend to ameliorate those differences.

Our compensation comparisons for the executives as well as for the manufacturing production employees are more extensive than most other studies because we considered both total compensation costs from the employer's viewpoint and the replacement value of the compensation package, both public and private components, from the employee's viewpoint. Integration of international goods and capital markets provides an economic mechanism driving total compensation costs to equality across countries. Our evidence suggests

that the increased trade in goods and capital has come at the same time as lower intercountry variance in total compensation costs for all three positions studied. This result suggests that factor price equalization may have been an important factor driving changes in wage rates across countries. The integration of world labor markets is required to drive the replacement value of the compensation package to equality across countries. We find no evidence that the intercountry variance in the replacement value of compensation has changed over our sample period.

While one could refine many of the measures used in this paper, we believe that our basic conclusions are sound regarding the relative compensation structures and the correlates of differences across countries in these structures. American CEOs are paid more than their counterparts elsewhere. Whether that higher pay is justified by the economic performance of the firms that these Americans manage is still an open question. Regardless of the answer to this question, it is clear that the American pay advantage is limited to CEOs. American high-level managers and manufacturing production workers are compensated in a manner quite typical of the other developed countries we studied.

Data Appendix

Compensation Data

Sources for CEO Compensation data in 1984 and 1988–92

Arthur Young (1985) includes base plus bonus, estimated personal income taxes, and estimated employee payroll taxes. Employer payroll taxes (compulsory benefits), voluntary benefits, perquisites, and long-term compensation were estimated using the sources listed below. Towers Perrin (1988) includes, for 1988, base plus bonus, compulsory benefits, perquisites, long-term compensation, estimated income taxes, and estimated employee payroll taxes. Voluntary benefits were estimated for 1988 using the sources listed below. Data are for a company with $100 million in annual sales. Towers Perrin (1991) includes voluntary benefits. Data are for a company with $250 million in annual sales. Towers Perrin (1989, 1990) include the same variables as 1988, while Towers Perrin (1992) is comparable to 1991. Wyatt Company (1992b) includes base plus bonus, estimated individual income taxes, and estimated employee payroll taxes. To facilitate comparisons with Towers Perrin, Wyatt base plus bonus estimates were adjusted to represent a company with $250 million annual sales using Wyatt's regression coefficients. Voluntary benefits, compulsory benefits, perquisites, and long-term compensation were estimated using Towers Perrin (1992) and the sources listed below. Wyatt Company (1992c) includes only base plus bonus. All other Japanese compensation com-

ponents were estimated using Towers Perrin (1992) and the sources listed below. The 1992 Wyatt Japanese base plus bonus data are for a company with 1,000–2,999 employees.

Sources for HRD Compensation in 1984, 1991, and 1992

Arthur Young (1985), Towers Perrin (1991, 1992), and Wyatt Company (1992b, 1992c). All variables are comparable to the CEO variables discussed above from the same source.

Source for Cadre Dirigeant (highest management level) and Cadre Supérieur (senior management) in 1991

Bénichou (1992) reports the results of a specially commissioned study by the Hay Group, giving base plus bonus, estimated individual income taxes, and estimated employee payroll taxes. Voluntary benefits, compulsory benefits, perquisites, and long-term compensation were estimated using Towers Perrin (1991) and the sources listed below.

Sources for Manufacturing Employee Compensation in 1984 and 1988–92

U.S. Department of Labor (1991) includes hourly total compensation costs for a manufacturing production worker from each of our countries in each of our analysis years. We compare the BLS component "pay for time worked," which includes all cash payments made to the workers before any deductions of any kind, to executive base plus bonus. Voluntary benefits are measured as the difference between the BLS "hourly direct pay," which includes the compensation components normally classified as voluntary benefits, and "pay for time worked." Compulsory benefits are measured as the BLS "employer social insurance expenditures," which includes all legally mandated compensation components. We used OECD (1991a, 1992a) to estimate the BLS measures for 1991 and 1992. OECD hourly rates in manufacturing were used to estimate 1991 and 1992 hourly compensation costs by multiplying by the 1990 ratio of BLS hourly compensation costs to hourly pay for time worked. A comparable calculation was used to estimate the voluntary and compulsory benefits components. Annual hours were taken from International Labor Organization (1991). We assumed that no additional perquisites and no long-term compensation were paid to the manufacturing employees. Note that pension costs are included by the BLS in the two benefit measures as appropriate.

Personal Income Tax Rates

Primary Sources for Personal Income Tax Rates for all Executives and Manufacturing Employees in 1984

Deloitte Haskins and Sells (1985), U.S. Department of the Treasury (1984), and OECD (1988).

Primary Sources for CEO Personal Income Tax Rates in 1988–90

DRT International (1991), all countries; the *OECD Economic Surveys*, all countries, various years; and Price Waterhouse, *Doing Business in . . .* , all countries, various years.

Primary Sources for Personal Income Tax Rates for All Executives in 1991–92

Towers Perrin (1991, 1992).

Primary Sources for Personal Income Tax Rates for Manufacturing Employees in 1991 and 1992

Wyatt Company (1992a), Price Waterhouse, *Doing Business in . . .* , all countries, various years.

Corporate Income-Tax Rates

Primary Source for Corporate Income Tax Rates in 1984

Price Waterhouse (1984).

Primary Source for Corporate Income Tax Rates in 1988–92

DRT International (1991), all issues; the *OECD Economic Surveys*, all countries, various years; and Price Waterhouse, *Doing Business in . . .* , all countries, various years.

Social Security and Other Payroll Taxes

Social Security and Other Payroll Taxes for Manufacturing Employees

U.S. Department of Labor (1990, 1991).

Social Security and Other Payroll Taxes for All Executives

Deloitte Haskins and Sells (1985), William M. Mercer International (1987, 1992), Towers Perrin (1988), and Wyatt Company (1992a). Private communication with INSEE Division of Revenue was used for French payroll taxes.

Public Benefits Sources and Expenditure Categories

European Community Countries (Belgium, France, Germany, Italy, the Netherlands, Spain, and the United Kingdom)

Eurostat (1989, 1990, 1991, 1992).

Other Countries

Statistics Canada (1988, 1990, 1992), Japan Productivity Center (1988, 1990), Japan Institute of Labor (1991), Management and Coordination Agency (1991), Statistics Sweden (1992), Central Bureau of Statistics of Norway (1992) (the Norwegian tables contained some comparative data with Sweden), Nordic Statistical Secretariat (1990), Office Fédéral de la Statistique (1989, 1992), U.S. Chamber of Commerce (1991), U.S. Department of Commerce (1989, 1990, 1991), and International Monetary Fund (1991).

Exchange Rates and Purchasing Power Parities and Consumer Prices

Average annual exchange rates are from CITIBASE (1989). Where rates could not be found in CITIBASE (1989), they were taken from U.S. Department of Labor (1991).

For the basis on which the OECD computed purchasing power parities, see OECD (1992d). To compute 1990-based purchasing power parities in the years 1985, 1990, and 1991, we used OECD (1992b). We used changes in consumer prices to put the other year purchasing power parities on the base year 1990 and, thus, to estimate the 1984, 1988, 1989, and 1992 purchasing power parities using OECD (1989a, 1992a).

The U.S. consumer price index is from CITIBASE (1989). The OECD index of consumer prices is from OECD (1990a, 1992b).

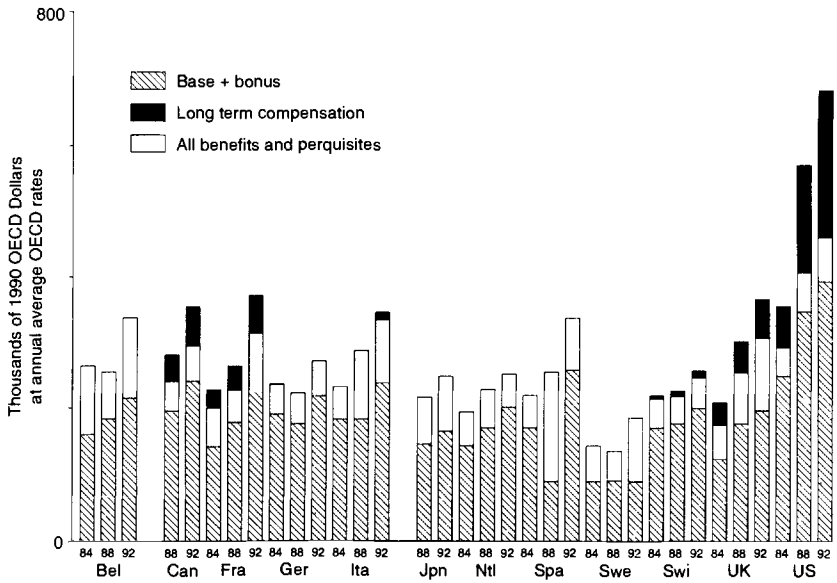

Fig. 2A.1 Total compensation of CEOs at purchasing power parity exchange rates, 1984–92

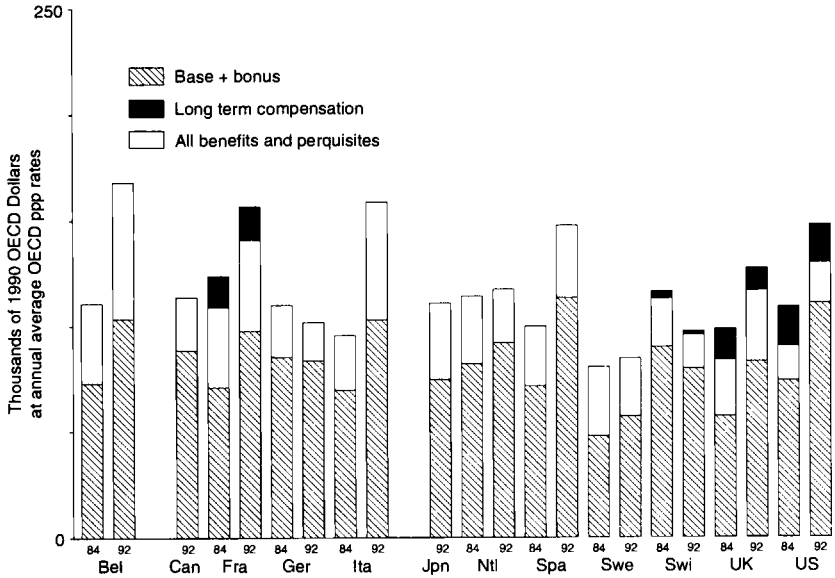

Fig. 2A.2 Total compensation of HRDs at purchasing power parity exchange rates, 1984–92

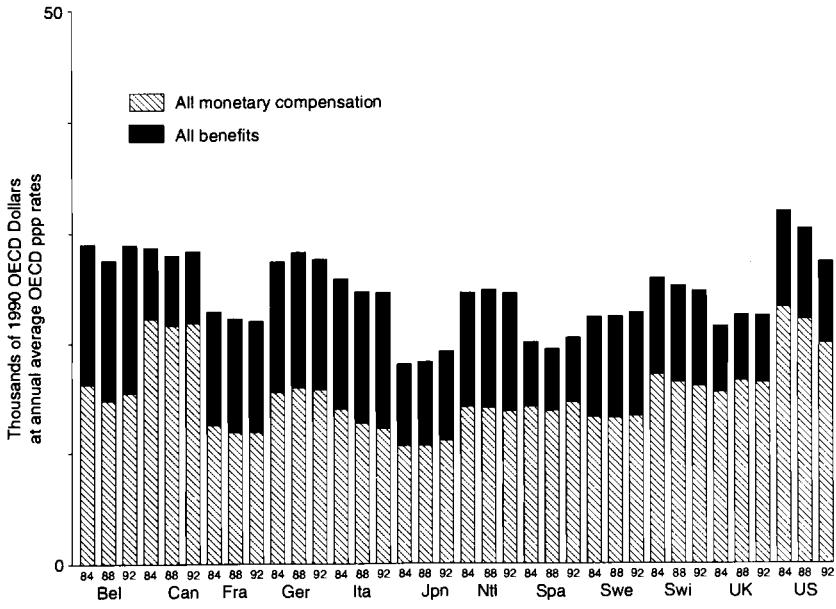

Fig. 2A.3 Total compensation of manufacturing operatives at purchasing power parity exchange rates, 1984–92

References

Abowd, John M. 1990. Does performance-based compensation affect corporate performance? *Industrial and Labor Relations Review* 43, no. 3: 52–73.

Arthur Young. 1985. *Executive compensation international.* New York: Business International Corp.

Bénichou, Paul. 1992. Les cadres français sont-ils bien payés? *Capital* 6 (March): 102–12.

Central Bureau of Statistics of Norway. 1992. *Statistical Yearbook of Norway.* Oslo.

Commission des Communautés Européennes. 1991. *Statistiques de base de la Communauté.* Luxembourg: Office des Publications Officielles des Communautés Européennes.

Charterhouse. 1989. *Top management remuneration, 1988/1989.* Essex: Monks Partnership.

———. 1991. *Board earnings United Kingdom, 1990/1991.* Essex: Monks Partnership.

CITIBASE. 1989. Citibank economic database [machine-readable magnetic data file], 1946–present. New York: Citibank N.A.

Crystal, Graef. 1991. *In search of excess: The overcompensation of the American executive.* New York: Norton.

———. 1993. *In search of excess: The overcompensation of American executives.* 2d ed. New York: Norton.

Deloitte Haskins & Sells. 1985. *Taxation of international executives.* New York: Kluwer Law and Taxation.

U.S. Department of the Treasury. Internal Revenue Service. 1984. *Instructions for preparing form 1040.* Washington, D.C.

DRT International. 1991. *International tax and business guides (Canada, Europe, Japan and United States editions).* New York.

Ehrenberg, Ronald, and George T. Milkovich. 1987. Compensation and firm performance. In *Human resource management and the performance of the firm,* ed. M. Kleiner et al. Madison: IRRA.

Eurostat. 1989. *Basic statistics of the Community.* Luxembourg.

———. 1990. *Basic statistics of the Community.* Luxembourg.

———. 1991. *Basic statistics of the Community.* Luxembourg.

———. 1992. *Demographic statistics.* Luxembourg.

Gerhart, Barry, and George Milkovich. 1990. Organizational differences in executive compensation and firm performance. *Academy of Management Journal* 33 (April): 1–30.

International Labor Organization. 1991. *Yearbook of labor statistics.* Geneva.

International Monetary Fund. 1991. *Government finance statistics yearbook.* Washington, D.C.

Japan Productivity Center. 1988. *Practical handbook of productivity and labor statistics, 1987/1988.* Tokyo.

———. 1990. *Practical handbook of productivity and labor statistics, 1989/1990.* Tokyo.

Japan Institute of Labor. 1991. *Japanese working life profile—labor statistics.* Tokyo.

Jensen, Michael C., and Kevin J. Murphy. 1990a. CEO incentives: It's not how much you pay, but how. *Harvard Business Review* 68, no. 3 (May/June): 138–49.

———. 1990b. Performance-pay and top management incentives. *Journal of Political Economy* 98 (April): 225–62.

Leonard, Jonathan S. 1990. Executive pay and corporate performance. *Industrial and Labor Relations Review* 43, no. 3: 13–29.

Management and Coordination Agency. Statistics Bureau. 1991. *Japan statistical yearbook, 1991.* Statistics Bureau. Tokyo.

Mitchell, Daniel J. B., and Jacques Rojot. 1991. Employee benefits in the context of Europe 1992. Working paper. University of California, Berkeley, March.
Nordic Statistical Secretariat. 1990. *Yearbook of Nordic statistics, 1989/1990.* Copenhagen: Nordic Council of Ministers and Nordic Statistical Secretariat.
OECD. 1985. *1984/1985 OECD economic surveys—Netherlands.* Paris.
———. 1987a. *1986/1987 OECD economic surveys—Netherlands.* Paris.
———. 1987b. *Purchasing power parities and real expenditures 1985.* Paris.
———. 1988. *1987/1988 OECD economic surveys—Japan and Switzerland.* Paris.
———. 1989a. *Economic outlook.* Paris, June.
———. 1989b. *1988/1989 OECD economic surveys—Spain.* Paris.
———. 1990a. *Main economic indicators: Historical statistics.* Paris.
———. 1990b. *1989/1990 OECD economic surveys—Canada, Germany, Japan, Netherlands, Switzerland, United Kingdom, and United States.* Paris.
———. 1991a. *Main economic indicators.* Paris, December.
———. 1991b. *1989/1990 OECD economic surveys—Italy, France, Germany, Italy, Japan, Spain, Sweden, United Kingdom, and United States.* Paris.
———. 1992a. *Economic outlook.* Paris, June.
———. 1992b. *Main economic indicators.* Paris, September.
———. 1992c. *1991/1992 OECD economic surveys—Belgium, France, Germany, Netherlands, and Spain.* Paris.
———. 1992d. *Purchasing power parities and real expenditures 1990.* Paris.
Office Fédéral de la Statistique. 1989. *Annuaire statistique de la Suisse.* Bern.
———. 1992. *Annuaire statistique de la Suisse.* Bern.
Price Waterhouse. 1984. *Capital formation—international survey and analysis.* New York.
———. 1987. *Doing business in . . . (Japan and United States editions).* New York.
———. 1990. *Doing business in . . . (Belgium, Japan, Netherlands, Sweden editions).* New York.
———. 1991. *Doing business in . . . (France, Switzerland, United Kingdom and United States editions).* New York.
———. 1992. *Doing business in . . . (Belgium, Canada, Germany and United Kingdom editions).* New York.
Rosen, Sherwin. 1990. Contracts and the market for executives. NBER Working Paper no. 3542. Cambridge, Mass.: National Bureau of Economic Research, December.
Statistics Sweden. 1992. *Statistical yearbook of Sweden 1992.* Stockholm.
Statistics Canada. 1988. *Canada year book 1988.* Ottawa.
———. 1990. *Canada year book 1990.* Ottawa.
———. 1992. *Canada year book 1992.* Ottawa.
Towers Perrin. 1988. *Worldwide total remuneration, 1988.* New York.
———. 1989. *1989 executive pay update—worldwide total remuneration.* New York.
———. 1990. *1990 executive pay update—worldwide total remuneration.* New York.
———. 1991. *1991 worldwide total remuneration.* New York.
———. 1992. *1992 executive pay update.* New York.
U.S. Chamber of Commerce. Research Center. 1991. *Employee benefits.* Washington, D.C.
U.S. Department of Commerce. Bureau of the Census. 1987. *Statistical abstract of the United States, 1987.* Washington, D.C.
———. 1989. *Statistical abstract of the United States, 1989.* Washington, D.C.
———. 1990. *Statistical abstract of the United States, 1990.* Washington, D.C.
———. 1991. *Statistical abstract of the United States, 1991.* Washington, D.C.
U.S. Department of Labor. Bureau of Labor Statistics. 1990. *International comparisons of hourly compensation costs for production workers in manufacturing, 1975, 1980 and 1982–89.* Report no. 787. Washington, D.C.

———. 1991. *International comparisons of hourly compensation costs for production workers in manufacturing, 1975–90.* Report no. 817. Washington, D.C.
William M. Mercer International. 1987. *International benefits guidelines.* New York.
———. 1992. *International benefits guidelines.* New York.
William M. Mercer International and Arthur Anderson & Co. 1990. *Globalizing compensation extending stock option and equity participation plans abroad.* New York.
Wyatt Co. 1992a. *Benefits report—Europe U.S.A.* Brussels.
———. 1992b. *Top management remuneration—Europe U.S.A.* Brussels.
———. 1992c. *Wyatt-Seikei top management compensation—Japan.* Tokyo.
Wyatt Data Services. 1992. *1992/1993 top management report,* vols. 1–3. Fort Lee, N.J.

This Page Intentionally Left Blank