DOCUMENT RESUME

ED 273 630 SP 028 041

AUTHOR Barro, Stephen M.; Lee, Joe W.
TITLE A Comparison of Teachers' Salaries in Japan and the United States.
INSTITUTION SMB Economic Research, Inc., Washington, DC.
SPONS AGENCY Center for Statistics (OERI/ED), Washington, DC.
REPORT NO CS-86-222
PUB DATE Sep 86
CONTRACT 300-84-0265
NOTE 71p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Comparative Analysis; *Economic Factors; Elementary Secondary Education; Foreign Countries; *Public School Teachers; Teacher Retirement; *Teacher Salaries; Teaching (Occupation)
IDENTIFIERS *Japan; *United States

ABSTRACT

This comparative analysis of the salaries of Japanese and American public school teachers addresses these principal questions: (1) How does the level of public school teachers' salaries in Japan (measured in terms of teachers' purchasing power) compare with that in the United States? (2) How does the teachers' salary structure in Japan compare with that in the United States? and (3) How well are teachers rewarded relatively in the two countries compared with levels of income and output in each country and with the rewards available in non-teaching occupations? Specific data are presented on: (1) structure of salaries in Japan and the United States; (2) differences between the two countries on other conditions of teaching (qualifications, duties, and working conditions); (3) Yen-to-Dollar conversions; (4) comparisons of average salaries and recent trends; (5) the relationship of teacher pay to seniority; (6) teachers' salaries relative to general levels of economic activity; and (7) teachers' salaries relative to salaries in other occupations. (JD)

A Comparison of Teachers' Salaries in Japan and the United States

SMB Economic Research, Inc.

Stephen M. Barro
With the assistance of
Joe W. Lee

Larry E. Suter
Project Officer
Center for Statistics

Prepared for the Center for Statistics under contract 300-84-0265 with the U.S. Department of Education. Contractors undertaking such projects are encouraged to express freely their professional judgment. This report, therefore, does not necessarily represent positions or policies of the Government, and no official endorsement should be inferred. This report is released as received from the contractor.

September 1986

CS 86-222

PREFACE

This report is one product of a study, "International Comparison of Teachers' Salaries," sponsored by the National Center for Education Statistics. The full study compares teachers' salaries in the United States with those in ten other developed countries. This more detailed, bilateral comparison of salaries between the United States and Japan has been prepared because of the special current interest of American education policymakers in lessons to be learned from the Japanese educational system. It presents comparative salary information in greater depth than is feasible in the multinational analysis.

We are grateful for the assistance of Mr. Shogo Ichikawa, Director of Research Department II of the National Institute for Educational Research in Tokyo, who provided much of the Japanese data on which our analysis is based and offered detailed comments on an earlier draft of this report; to Mr. Akio Nakajima, Director of the Policy Division, Japan Ministry of Education, Science and Culture, and members of his staff, who supplied and helped us interpret statistical data on Japanese teachers and their salaries; to Prof. Robert Summers, University of Pennsylvania, for providing and interpreting purchasing-power-parity exchange rates; and to Mr. Jewell Gould, American Federation of Teachers, for supplying salary data for U.S. school districts. We have also received helpful comments and advice from Dr. William K. Cummings, U.S. National Science Foundation; Dr. Ken Shimahara, Rutgers University; and Dr. Larry Suter, National Center for Education Statistics. None of those named bears responsibility for our interpretations or uses of the data or for the findings or conclusions of this report.

CONTENTS

LIST OF TABLES AND FIGURES

I. INTRODUCTION

Concerns about the quality of schooling in the United States have made U.S. education policymakers increasingly willing to learn from other countries' experiences. In particular, the economic and technological successes of Japan have generated great interest in how that country runs its educational system. Of special current relevance, given ongoing efforts to raise the quality of teaching and, especially, to reform teacher compensation systems in the U.S., are the questions of how Japan pays its teachers and how the economic status of Japanese teachers compares with that of teachers in this country. This report, a comparative analysis of the salaries of Japanese and American public school teachers' salaries, addresses these issues. It is offered in the hope that information on teacher reward systems in other countries will make some small contribution to the ongoing debate over teacher pay and incentives in the United States.

The principal comparative questions addressed in this paper are the following:

1. How does the level of public school teachers' salaries in Japan (measured in terms of teachers' purchasing power) compare with that in the United States?
2. How does the teachers' salary structure in Japan compare with that in the United States?
3. How well are teachers rewarded relatively in the two countries—that is, compared with levels of income and output in each country and with the rewards available in nonteaching occupations?

In addition, to put salary comparisons in context, the report provides limited descriptive information on other aspects of the teaching job in each country. This is primarily a comparison of salaries, however, and no

attempt has been made to deal comprehensively with the broader question of how teaching differs between the United States and Japan.

The data for the Japanese side of these comparisons were obtained from the Japanese Ministry of Education, Science and Culture (Mombusho), and the National Institute of Educational Research in Tokyo. The main sources include education statistics compiled and published by the Ministry of Education, Science and Culture; survey results published by the Ministry of Home Affairs, the Ministry of Labor, and the Statistics Bureau of the Management and Coordination Agency; and some special unpublished tabulations made available to us by Japanese education officials. These officials have also assisted us in interpreting the data, but many interpretations are our own, and we are responsible for any errors that remain.

The U.S. data are in some ways more problematic than the Japanese data, mainly because the U.S. system is so decentralized. Data on average salaries of U.S. teachers are produced by both the National Education Association (NEA) and the American Federation of Teachers (AFT), but no one produces information on salary structures or schedules, which can be compared with similar information for Japan.[1] Consequently, we have had to construct an average, or typical, teacher salary schedule ourselves, using such data as could readily be assembled from existing sources. That this schedule is based on limited and perhaps not fully representative data is a significant limitation of the analysis. We also make use, at various points in the analysis, of nonsalary data from the National Center for

[1]No official U.S. Government data on teachers' salaries have been produced in recent years. Publications of the National Center for Education Statistics (NCES) rely on the NEA's data on average teachers' salaries, just as we do in this report.

Education Statistics (NCES) and earnings data from the Bureau of Labor Statistics. In addition, we have obtained certain data on both the U.S. and Japan from publications of international agencies, notably the International Labor Office (ILO) and the Organization for Economic Cooperation and Development (OECD).

Our main comparative findings are presented in summary form in the section immediately following this introduction (Section II), and the details are spelled out in three subsequent sections. Section III provides descriptive information on teacher salary structures and other conditions of teaching in Japan and the United States; Section IV presents comparisons of salary levels and salary structures between the two countries; and Section V presents comparisons of the relative economic status of teachers. Further details regarding the data and computations are provided at the end of the paper in a series of Technical Notes.

II. MAIN FINDINGS

the following are brief statements of the major comparative findings of the study.

Average Salary Levels

The average salaries of Japanese and U.S. teachers were nearly equal in purchasing power during the most recent year for which data are available, 1983-84. Specifically, we estimate that the average salary of a Japanese teacher in that year, converted into "equivalent dollars" according to a purchasing-power-parity (PPP) exchange rate, was $20,775, as compared with a U.S. average of $21,476 during the same period.[2,3] However, this equivalency needs to be assessed in light of such factors as the longer work year in Japan, the greater average seniority of Japanese than American teachers, and the higher academic qualifications of teachers in the United States.

Recent Trends in Relative Salary Levels

The rough equivalency in 1983-84 average salaries reflects a recent decline in the salaries of Japanese teachers relative to those of teachers in the U.S. We estimate that the ratio of the average Japanese salary to the average U.S. salary was 6 percent higher in 1979-80 than in 1983-84,

---

[2]The period in question is the Japanese 1983-84 school year, April 1983-March 1984. The salary figure cited for the U.S. is our estimate of the average salary paid to U.S. teachers during the same interval.

[3]PPP rates are based on comparisons of the costs of specified market baskets of goods in each country. Unlike the more familiar market exchange rates, they are not influenced by economic expectations, interest rates, capital flows, or other financial market factors; consequently, they are more suitable for comparing the purchasing power of salaries denominated in different currencies. The nature of PPP rates and the reasons for using them are discussed in Section IV.

but a very slow rate of improvement in Japanese teachers' salary schedules between 1981 and 1984 has eliminated the former Japanese advantage.

Relationship of Pay to Seniority

Teachers' salaries in Japan are more strongly linked to seniority than are teachers' salaries in the U.S. A teacher with a 4-year degree at the top of the seniority scale in Japan earns about three times as much as an entering teacher, compared with less than twice as much in the U.S. Japanese teachers continue to earn seniority-based pay increments throughout their careers (i.e., Japanese pay scales have up to 39 annual "steps"), while U.S. salary schedules typically "top out" after 10 to 15 years.

Relationship of Pay to Teacher's Education

In both Japan and the U.S., a teacher's salary depends on his or her highest academic degree, but teacher's education is a less important determinant of salary in the Japanese system. One reason is that Japanese pay scales are designed so that the salary differentials associated with higher degrees diminish with seniority, whereas such differentials remain the same or increase with seniority in the U.S. Another reason is that only about 2 percent of Japanese teachers have advanced degrees, as compared with about 50 percent in the U.S. (On the other hand, pay differentials between teachers with and without 4-year college degrees play a role in Japan, since nearly 30 percent of Japanese teachers—as compared with fewer than 1 percent in the U.S.—have less than a bachelor's degree).

Comparative Pay at Different Points in the Career

The salaries of newly hired Japanese teachers are 20 to 25 percent lower than those of entering teachers in the U.S., but salaries of senior

Japanese teachers are substantially higher--by as much as 30 to 40 percent--than those of their equally experienced U.S. counterparts. The cross-over occurs at around 20 years of service (for teachers with 4-year college degrees), before which U.S. teachers are better paid, but after which Japanese salaries are greater. Moreover, the effect of large rewards for seniority is magnified by the fact that 40 percent of Japanese teachers (nearly twice the percentage as in the U.S.) have accumulated 20 or more years of service.

Teachers' Salaries Relative to General Levels of Economic Activity

Japanese teachers' salaries are substantially higher relative to national indicators of per capita economic activity than are teachers' salaries in the United States. Specifically, the average teacher's salary in Japan was 2.4 times as great as that country's per capita income in 1983, as compared with 1.7 times per capita income in the U.S., and 3.4 times as great as per capita consumption in Japan, as compared with 2.3 times per capita consumption in the U.S. This means that the average Japanese teacher's salary buys a significantly larger share of the nation's goods and services than does the average teacher's salary in the United States.

Relative Economic Status and Seniority

The relative economic status of Japanese and U.S. teachers depends strongly on seniority. At the outset, the Japanese teacher's salary is only slightly higher, relative to national per capita income or output, than that of the U.S. teacher. After 35 years of teaching, however, the Japanese teacher's relative advantage is in the range of 80 to 100 percent. The difference in relative position is so large that it seems

fair to conclude (subject to uncertainties regarding the relationship between salary and household income) that senior Japanese teachers enjoy a relative standard of living beyond the reach of equally senior teachers in the United States.

Salaries in Teaching Relative to Salaries in Other Occupations

The limited comparisons we have been able to make of salaries in teaching with salaries in other occupations generally support the finding that the relative economic status of teachers is higher in Japan than in the United States. The ratio of the average teacher's salary to the average wage in manufacturing is higher in Japan, as is (to a lesser extent) the ratio of teacher salary to the average wage in all private nonagricultural activities. Teachers' salaries are also higher in Japan than in the U.S. relative to salaries in a variety of blue-collar, manual, clerical, and technical/professional occupations. Unfortunately, we have not been able to obtain directly comparable figures on pay levels in such fields as accounting, management, and engineering, and consequently we cannot report definitively on how teachers fare in each country relative to college-educated workers in these other professions.

III. TEACHER SALARY STRUCTURES AND OTHER CONDITIONS OF TEACHING IN JAPAN AND THE UNITED STATES

Before presenting quantitative comparisons of Japanese and U.S. salaries, we provide in this section descriptive information on the salary structure and other conditions of teaching in each country. The salary structures are described so that there will be no ambiguity about the types of salary figures being compared. The information on other conditions of teaching (teacher qualifications, days and hours of work, class sizes, etc.) is intended to identify nonsalary factors that should be considered in interpreting the reported differences in pay. We do not attempt actually to adjust salaries for such factors, although we do comment on the adjustments implied by certain gross differences, such as the unequal lengths of the school year.

THE STRUCTURE OF SALARIES IN JAPAN

The Japanese National Personnel Authority has established a national teachers' salary structure, which, though directly applicable only to national schools, provides the model on which salary structures of public schools throughout the country are based.[4,5] We have been advised that local deviations from the national salary structure are relatively minor. We have also confirmed directly that the variance in pay among Japan's 47

---

[4]The National Personnel Authority also recommends annual rates of increase in the level of teachers' pay, but the final decision rests with the Government. From 1982 to 1984, the approved increase was substantially below the National Personnel Authority's recommendation.

[5]Most public elementary-secondary enrollment in Japan is in locally controlled public schools; less than 5 percent is in national schools (Ministry of Education, Science and Culture, 1985).

prefectures is low.[6] Thus, it appears justifiable to use the national salary structure to represent Japan in comparisons with the United States.

The main characteristics of Japan's national teacher salary structure can be summarized as follows:

1. There is one set of salary schedules for teachers in elementary and lower secondary schools and another for teachers in upper secondary schools.

2. The salary schedules relate a teacher's basic salary primarily to his or her seniority. Salary continues to increase with seniority for up to 39 years—which is to say, up to the age of retirement.

3. Teachers are rewarded for earning academic degrees by being advanced a specified number of steps along the salary scale (e.g., three steps for a master's degree). Thus, both seniority and highest degree earned affect one's position on the salary ladder.[7]

4. A distinction is made between teachers and assistant teachers, and the latter are paid according to separate, lower salary scales; however, only a tiny fraction of the teaching force falls into the "assistant" category.[8]

---

[6]The standard deviation in average basic salary among the 47 prefectures of Japan is only 7 percent of the mean for elementary and lower secondary teachers and only 5 percent of the mean for upper secondary teachers, according to data reported in Ministry of Home Affairs (1985). This variance mainly reflects differences in levels of teacher experience and training among the prefectures rather than differences in salary structures.

[7]In addition, we understand that teachers can be rewarded by being advanced along the salary scale at more than the normal one-step-per-year rate. Specifically, the national law governing salaries of civil servants, which applies to teachers in national schools, allows up to 15 percent of teachers to be rewarded by special advancement each year. Local civil servants, including teachers in local public schools, are treated similarly, although the specifics vary according to local circumstances and collective bargaining agreements (personal communication, Shogo Ichikawa, National Institute for Educational Research).

[8] Fewer than 5,000 out of 860,000 teachers fell into the "assistant" category as of April 1984, according to data in Ministry of Education, Science and Culture (1985). Note that in addition to regular and assistant teachers, the categories of principal and vice-principal are included in the Japanese teacher salary structure, but we have excluded them throughout

5. A teacher's total salary is made up of his or her basic salary, as specified in the applicable schedule, plus a large "bonus" (paid semiannually) equal to nearly five months base salary, plus an array of special allowances based on personal need factors and teaching assignments.

The national salary schedules for primary/lower secondary and upper secondary regular teachers, effective April 1, 1984, are shown in Table 1. The table entries are monthly base salaries in thousands of yen. They do not include the bonus and allowances, which are appended to base salaries according to formulas described below. The letters T, B, M, and D indicate the starting levels of pay for teachers with 2-year, 4-year (bachelor's), master's, and doctor's degrees, respectively. Note that these starting salaries are the same at the elementary/lower secondary and upper secondary levels.[9] For example, the basic starting salary of a new teacher with a bachelor's degree is ¥119,600 per month regardless of the level. Later in their careers, however (beginning at 20 years of service), upper secondary teachers are paid slightly more than elementary or lower secondary teachers with the same experience and degrees. For example, after 30 years of service, the difference in pay between an upper secondary school teacher and an elementary or lower secondary school teacher with a bachelor's degrees is 2.6 percent. The difference in pay between a teacher with a master's degre and one with a bachelor's degree is approximately 17 percent initially, but this difference diminishes with seniority, both relatively and absolutely, and amounts to only about 3 percent at the end of the teaching career.

---

this report to maintain comparability with U.S. teacher salary figures.

[9]At the upper secondary level, an individual with only a 2-year degree can qualify only as an assistant teacher, and hence no starting salary for that degree level is shown in the table.

Table 1

SALARY SCHEDULES FOR REGULAR TEACHERS IN NATIONAL SCHOOLS IN JAPAN, EFFECTIVE APRIL 1984
(Thousands of Yen per Month[a])

Step	Teachers in Elementary and Lower Secondary Schools	Teachers in Upper Secondary Schools
1	103.4 T	113.9
2	108.7	119.6 B
3	113.9	126.5
4	119.6 B	133.4
5	126.5	140.3 M
6	133.4	147.2
7	140.3 M	154.1
8	147.2	160.9
9	154.1	167.7 D
10	160.9	174.5
11	167.7 D	181.3
12	174.5	188.4
13	181.3	196.3
14	188.4	204.2
15	196.3	212.3
16	204.2	220.3
17	212.3	228.1
18	220.3	235.9
19	228.1	243.7
20	235.9	251.5
21	243.7	259.4
22	251.4	267.2
23	259.2	274.9
24	266.9	282.7
25	273.9	290.4
26	280.7	297.4
27	287.6	304.2
28	293.9	311.0
29	300.0	317.8
30	305.8	324.6
31	311.5	330.5
32	317.1	336.2
33	322.1	341.0
34	327.0	345.3
35	331.5	349.4
36	335.3	353.5
37	339.0	356.5
39	345.3	

Source: Ministry of Education, Science and Culture

Note: T, B, M, and D indicate starting salaries for teachers with 2-year, bachelor's, master's, and doctorate degrees, respectively.

[a]At a purchasing-power-parity exchange rate of 226 yen per dollar (see Table 4), the dollar equivalents of the monthly base salaries shown here (exclusive of bonus and allowances) range from $458 for an elementary teacher with no experience to $1,577 for a secondary teacher with 37 years service.

Similarly, the pay differential at the elementary or lower secondary levels between teachers with 4-year and 2-year college degrees is about 16 percent initially, but this too eventually declines to a differential of only about 3 percent.

Table 2 presents the formulas and/or amounts used in calculating the bonus and the various allowances. The bonus alone adds nearly five months pay, or almost 41 percent, to the basic scheduled salary, and the allowances add another 23 to 25 percent, depending on the level of education, making the total annual salary equal, on average, to 164 percent of base pay for elementary and lower secondary teachers or to 166 percent of base pay for upper secondary teachers.[10] Naturally, we use total salary figures, not just base salaries, to represent Japan in salary comparisons with the United States.

THE STRUCTURE OF SALARIES IN THE UNITED STATES

It is something of a misnomer to speak of a teacher salary structure for the United States, since there are neither nationally prescribed nor state-prescribed structures but only the salary systems of thousands of local school districts. Nevertheless, there is sufficient national uniformity of certain qualitative attributes of local pay systems that one can speak meaningfully of a standard method of paying American teachers. Any quantitative description, however, can pertain only to average pay levels and "typical" pay scales, around which there are large local variations. To illustrate the extent of this variation, statewide averages of teachers'

[10]We do not know the percentage of teachers receiving each allowance, but we do have data, extracted from a survey of earnings of local government employees (Ministry of Home Affairs, 1985), on the average amount paid per teacher for each type of allowance.

Table 2

BONUSES AND ALLOWANCES ADDED TO SCHEDULED BASE SALARIES OF JAPANESE TEACHERS, 1983-1985
(Amounts in Yen)

Kind of Allowance	Recipients	Amount or Formula
Bonus	All teachers	Yearly amount = 4.9 x (base salary + temporary area allowance) + 3.8 x family allowance.
Family allowance	Teachers with dependents	Monthly amount = 13,200 for spouse + 3,500 for each of next two dependents. Teacher without spouse: 8,900 for first dependent; 1,000 for others.
Child allowance	Teachers with three or more children	Monthly amount: 5,000 for each of third and subsequent children.
Temporary area allowance	Teachers in areas where living costs are relatively high	3, 6, or 7 percent of base salary + family allowance + administrative allowance, depending on area.
Traffic allowance	Commuters	Monthly amount: up to 21,700
Isolated area allowance	Teachers serving in isolated areas	Monthly amount: from 4 to 25 percent of salary + family allowance, depending on area.
Allowance for compulsory and other education school teachers	All teachers	Monthly amount: 6 percent of base salary, up to 20,200.
Cold area allowance	Teachers serving in cold areas	Monthly amount: variable (a lump-sum amount plus a percentage of base salary + family allowance).
Housing allowance	Teachers paying more than ¥9,000 monthly rent or owning their own homes	Monthly amount: up to 14,700.
Multigrade class allowance	Teachers in charge of multigrade classes	Daily amount: 230 for two-grade classes; 280 for three-grade classes.
Special service allowance	Paid for special services	Daily amount: 500 to 1,700.
Allowance for coordination and advice	Designated head teachers	Daily amount: 200.
Day and night service allowance	Teachers engaged in day and night watch duty	Daily amount: 1,600 to 3,600.
Infant care allowance	Female teachers who take infant care leave	Monthly amount: 10.92 percent of base salary.
Vocational education allowance	Upper secondary teachers of vocational education	Monthly amount: 6 or 10 percent of base salary.
Part-time and correspondence education allowance	Teachers in part-time and correspondence upper secondary schools	Monthly amount: 8 or 10 percent of base salary.

Source: Ministry of Education, Science and Culture (1982) with amounts modified according to unpublished data provided by the Policy Division, Ministry of Education, Science and Culture.

salaries in 1983-84, as given in NEA (1985), ranged from $15,812 in Mississippi to $27,659 in the District of Columbia (excluding Alaska's noncomparable figure of $37,807)--a range of 1.75 to 1; and the weighted standard deviation in average salary among states was 15 percent of the national mean. Moreover, this does not reflect the immense variation among districts within states, not only in average salary, but also in the shapes and parameters of salary schedules. Consequently, the only way to compare U.S. salary structures with those of Japan (or any other country) seems to be to construct a "typical" salary schedule for the U.S. We have done so, but using a far from ideal set of available data, for this Japan-U.S. comparison.

The characteristics that typify U.S. local salary structures, and which can be compared against the characteristics of the Japanese structure set forth earlier, are as follows:

1. A single salary schedule covers teachers at all levels from elementary through high school.

2. A teacher's scheduled salary is a function of experience and training. The typical local salary schedule takes the form of a matrix, in which the columns reflect units of post-baccalaureate education completed and/or higher degrees earned (e.g., B.A. only, B.A. + 30 units, M.A., M.A. + 30 units, etc.) and the rows correspond to years of service.[11] However, experience increments are usually paid only for the first 10 to 15 years of service, after which the salary schedule "levels off."[12]

---

[11]The rules for quantifying teacher experience and training vary among states and local districts. For example, districts differ in how they count teaching experience in other districts or states, in the gradations of educational attainment represented by the columns in their salary scales, and in whether they take in-service training as well as college or university credits into account in determining placement on the salary scale.

[12]The leveling-off points vary among districts and also, in some cases, among the teacher education categories recognized in a district's salary schedule. In addition, some districts offer special pay increments to

3. In general, no distinctions of rank among teachers and no ratings of merit or performance are reflected in teacher salary schedules, although such features do figure in the salary structures of a small percentage of U.S. school districts.[13]

4. Payments in addition to scheduled salaries are generally minor and are limited, in most cases, to compensation for specific extra services, such as coaching athletic teams and supervising other student activities. Extra pay is also sometimes offered to teachers of vocational education and teachers assigned to "difficult" schools. There are virtually no explicit extra payments based on personal need factors, such as family size, extent of commuting, or cost of housing.[14]

Our estimates of salaries paid to teachers with selected combinations of education and experience under a "typical" U.S. teacher salary schedule in 1983-84 are given in Table 3. They were developed in the following manner: First, we obtained from the American Federation of Teachers (AFT) salary schedules for a sample of 78 local school districts. Second, we calculated from this sample the average salaries associated with the selected combinations of teacher education and experience shown in the table. Third, we adjusted for the difference in average salary levels between districts in the AFT sample (which tend to be large, urban, and northeastern)

---

teachers who attain such milestones as 20 or 25 years of service.

[13]According to data from the NCES Survey of Teacher Demand and Shortage, reported in NCES (1985), 2.0 percent of U.S. public school teachers in 1983-84 were employed by districts with merit pay plans. Merit pay and other performance-based pay arrangements are likely to become more common in the near future, however, given the current movement in the U.S. toward implementation of teacher incentive plans.

[14]However, one might argue that U.S. counterparts of some of the geographically based (as opposed to individual need-based) allowances in the Japanese salary structure (notably, the temporary area, isolated area, cold area, and housing allowances) take the form of pay differentials among local school districts with different economic and environmental conditions. That is, market-based pay differentials in the U.S. substitute, to a degree, for administratively established differentials in Japan.

Table 3

SYNTHESIZED SALARY SCHEDULE FOR A "TYPICAL" U.S. LOCAL SCHOOL DISTRICT, 1983-84
(Scheduled Salaries in Dollars per Year)

Step	B.A. Degree	M.A. Degree	M.A. + 30 Units	Maximum
Step 1	13,764	14,782	15,554	16,372
Step 5	16,367	17,879	18,684	19,443
Step 10	20,172	21,998	23,058	24,204
Ceiling	22,725	25,914	27,009	28,147

Sources: calculated from AFT salary schedule data (see Technical Note 1).

and districts in the nation as a whole by multiplying each figure computed in the previous step by the ratio of the national average to the sample average teachers' salary.[15] Consequently, the level of the synthesized salary schedule reflects the U.S. salary average, while the shape of the schedule (i.e., the ratios among salaries corresponding to different education and experience levels) reflects the typical pattern of relative salaries in the AFT sample districts. For example, the salary shown for a teacher with an M.A. degree and 10 years of experience in Table 3 is 1.6 times the salary shown for a starting teacher because that is the average ratio in our sample districts.

There are several potential sources of error in this estimation procedure. The major problems have to do with the nonrepresentativeness of the AFT sample and the procedure for calibrating the schedule to the

[15]The adjustment factor was 0.927. That is, the national-average teachers' salary was 92.7 percent of the weighted mean teachers' salary in our sample of 78 districts.

national-average salary level. Details of the procedure and discussions of these problems are presented in Technical Note 1. While we are aware of the limitations of the estimates, they are the best we could construct with the available data, and so we have used them, misgivings notwithstanding, as the basis for our comparisons of Japanese and U.S. salary structures.

OTHER CONDITIONS OF TEACHING

The validity of any intergroup salary comparison, whether within a country or between countries, depends on the similarity of the workers and jobs being compared. Other things being equal, differences in qualifications, duties, and working conditions will be reflected in differences in pay; hence, such differences should be taken into account when salaries are compared. Ideally, they should be taken into account quantitatively. That is, it would be desirable, in comparing teachers' salaries in Japan and the U.S., to adjust the salary figures for differences in nonsalary factors and then to compare adjusted salaries between the two countries. But while some factors can be handled easily (e.g., salaries can be prorated for differing lengths of the work year), others are difficult to deal with, even in principle. How, for example, should one adjust salaries for differences in class size, much less for differences in pupil discipline, between the countries?[16] In light of the conceptual problems and data deficiencies, we have generally not attempted quantitative adjustments.

---

[16]The reason that one would want to adjust, in principle, for such workload factors is that, other things being equal, one would expect teachers with more difficult or demanding jobs to be compensated with higher pay. Thus, if teachers in two countries are paid the same, but the teaching job is more demanding in one country than the other, the effective pay rate (pay compensated for differential burden or effort) is lower in the former country than in the latter.

We do deal explicitly with experience and training differentials in Section IV, but otherwise confine ourselves to identifying the major nonsalary variables that should be considered when salaries are compared.

Teacher Qualifications

Japanese teachers have substantially less postsecondary schooling, on average, than American teachers. In the past, one could obtain a license to teach at the elementary and lower secondary levels in Japan after completing only 2 years of higher education, and one could be hired as an assistant teacher with only the equivalent of a high school diploma. Although virtually all recent entrants into teaching have 4-year college degrees, there are still significant numbers of older teachers in the system who have had 2 years or less of college-level training. In 1983-84, for example, approximately 41 percent of elementary school teachers, 24 percent of lower secondary teachers, and 11 percent of upper secondary teachers had not earned bachelor's degrees (Ministry of Education, Science and Culture, 1984). In contrast, 99.6 percent of all U.S. teachers, as of 1980-81, had at least a bachelor's degree (NEA, 1982). Moreover, in the same year, 56 percent of U.S. high school teachers, 47 percent of middle school and junior high school teachers, and 45 percent of elementary teachers held at least a master's degree (NEA, 1982), whereas the corresponding percentages in Japan in 1983-84 were only 4.9 percent, 1.1 percent, and 0.3 percent, respectively (Ministry of Education, Science and Culture, 1984). Consequently, a comparison of average teacher salaries between the two countries, unadjusted for the difference in average educational attainment, would understate the level of pay in Japan relative to the level of pay for teachers with the same educational attainment in the United States.

On the other hand, the average number of years of experience per teacher is higher in Japan than in the United States. In 1983-84, the average teacher in Japanese elementary and lower secondary schools had 16.8 years of service, and the average upper secondary school teacher had 17.5 years (Ministry of Home Affairs, 1985). We do not have U.S. data for 1983-84, but the average experience reported by the NEA for all U.S. teachers in 1980-81 was 13 years. Perhaps a more striking comparison, in light of the favorable treatment of senior teachers under Japanese salary schedules, is that in 1980-81 over 40 percent of Japanese teachers had been teaching for 20 years or more, as compared with 21.9 percent in the U.S. This was offset only fractionally by the greater percentage of young, recently hired teachers (less than 5 years of experience) in Japan—approximately 20 percent, as compared with 13.5 percent in the U.S. (Ministry of Education, Science and Culture, 1983; NEA, 1982). Because of the difference in average experience, a comparison of unadjusted average salaries overstates the level of pay in Japan relative to that in the U.S. for teachers of equal experience. To avoid such distortions, we present in Section IV comparisons of the salaries of teachers with specific combinations of experience and training as well as comparisons of average salaries.

Apart from experience and training, there is the more difficult question of how teacher quality differs between the two countries. We are not prepared to deal with that issue here; nor do we believe that it can be dealt with definitively, given the many impediments to qualify comparisons, even within a single country. Based on discussions with Japanese education officials and experts on Japanese education, we believe that the teaching profession in Japan attracts a higher-performing stratum of college graduates

than does teaching in the United States, but we do not have confirming data.[17] If this belief is correct, and to the extent that higher performance in college translates into higher-quality teaching, a comparison of average salaries would overstate the salary required in Japan, relative to that in the United States, to attract teachers of a given level of quality.

Sex Composition of the Teaching Force

Although teacher salary schedules are sex-neutral in both Japan and the United States, it does not follow that the average salaries of male and female teachers are equal. In the United States, male teachers are paid more than female teachers, on average, because (a) male teachers tend to be more experienced and to have completed more post-baccalaureate training, and (b) males tend to receive more supplemental pay for activities such as coaching.[18] We do not have data on salaries of male and female teachers in Japan, but it is not unlikely that the pattern is similar. Consequently, the sex composition of the teaching force should be taken into account in comparing average salaries between the countries.

A larger percentage of the teaching force is male in Japan than in the United States—59 percent in Japan (1982-83) versus 32 percent in

[17]We note, in particular, that the kinds of barriers that once limited the nonteaching job opportunities of women in the United States are far more formidable in Japan; that teaching, unlike many other occupations, offers women the same pay scales as men; and hence that teaching is an attractive option for many of the more talented female graduates of Japanese colleges and universities.

[18]According to NEA survey data, the mean annual contract salary (not including pay for extra duties) was 12 percent greater for males than for females in 1981; in addition, the reported amount of supplementary pay during the school year averaged 74 percent higher for males than for females (NEA, 1982). Similarly, Bureau of Labor Statistics data show that the weekly earnings of male teachers were 14 percent greater than those of female teachers in 1983 (Mellor, 1985).

the U.S. (1983-84). Broken down by level, 16.5 percent of U.S. elementary teachers and 50.3 percent of U.S. secondary teachers were male in 1983-84 (NCES, 1984), while in Japan, 40.0 percent of elementary teachers, 67.1 percent of lower secondary teachers, and 83.5 percent of upper secondary teachers were male in 1982-83 (Ministry of Education, Science and Culture, 1983). Assuming that the average male teacher's salary is higher than the average female teacher's salary in both countries, this difference in sex composition would tend to inflate the average salary figure in Japan relative to that in the United States.

Days and Hours Worked

One of the more clear-cut differences in conditions between the two countries is that the Japanese teacher's work year is longer. School is in session in Japan for up to 240 days per year, counting half days on Saturdays, as compared with only 180 days, on average, in the U.S. Moreover, Japanese teachers, as full-year employees, can be assigned duties even when students are not in school and have nothing akin to the American teacher's 3-month summer vacation. A comparison of annual salaries, therefore, overstates substantially the ratio of salary per day worked of an average teacher in Japan to salary per day worked of an average teacher in the U.S.

We do not have fully comparable data on hours of work in the two countries. On one hand, it appears that Japanese teachers are directly engaged in classroom instruction for fewer hours per week than American teachers, especially at the secondary level. According to one set of estimates, the average number of direct teaching hours per teacher per week in Japan in 1980 was 22.6 at the elementary and lower secondary levels and only 15.2 at the upper secondary level (National Institute for Educational

Research, 1983). In comparison, U.S. high school teachers reported an average of 26 hours of direct teaching per week in NEA's 1980-81 teacher survey (NEA, 1982). On the other hand, the official work week is longer in Japan--44 hours, as compared with the NEA's estimate of 36.5 in the U.S.. This is consistent with information that Japanese teachers perform many nonteaching functions not required of teachers in the U.S. (see below). A further complication is that we do not know how the number of "unofficial," or "uncompensated," hours put in by teachers in Japan compares with the average of 8.7 such hours per week reported for U.S. teachers in the same NEA survey. Thus, although it is clear that Japanese teachers work more weeks per year than American teachers, we cannot say whether this is offset or reinforced by a difference in hours per week.

We also note, in connection with days and hours, that Japanese teachers have much less opportunity than American teachers to supplement their salaries with outside earnings. The constraints of the Japanese school calendar are reinforced, in this regard, by social restrictions on acceptable types of outside employment for teachers (the main acceptable form of such employment being private tutoring). Some data on the outside earnings of U.S. teachers are reported in NEA (1982), but we have no information on the presumably smaller outside earnings of Japanese teachers, against which these might be compared.

Scope of Responsibilities and Availability of Support Staff

Although scope of responsibility is difficult to quantify, it seems clear that teachers in Japan are responsible for a wider range of functions than teachers in the U.S. The difference is related in large part, though not entirely, to the absence from Japanese schools of many of the types of

support personnel found in U.S. schools. For example, there are no professional counselors in upper secondary schools in Japan; teachers perform the counseling function themselves. Similarly, Japanese teachers assume most of the responsibilities borne by curriculum coordinators, attendance officers, and teaching aides in the U.S. They also perform clerical functions that would usually be handled by nonteaching personnel in American schools. In addition, they apparently spend considerably more time than American teachers in meeting with individual parents, and they have roles with no U.S. counterparts, such as participating, together with their students, in maintaining and cleaning the schools. We do not know, however, whether or to what extent these extra responsibilities translate into extra hours of work.

Pupil-Teacher Ratios and Class Sizes

Pupil-teacher ratios are higher and classes are larger in Japan than in the United States. In 1982-83, for example, the pupil-teacher ratios in locally controlled public schools in Japan were 27.9 at the elementary level, 22.6 at the lower secondary level, and 18.1 at the upper secondary level (Ministry of Education, Science and Culture, 1985); in comparison, the pupil-teacher ratios in U.S. public schools in the same year were 20.4 at the elementary level and 16.6 at the secondary level (NCES, 1985).[19] The class size differences are considerably greater. The average elementary class in local public schools in Japan contained 33.6 pupils in 1982, while the average lower secondary class contained 37.9 (Ministry of Education,

[19]The Japanese pupil-teacher ratios presented here are higher than those given in the cited source because we have subtracted principals and vice-principals from the teacher category to make the numbers compatible with pupil-teacher ratios reported in the U.S.

Science and Culture, 1985). The average class size in upper secondary schools was not reported, but the number of pupils per class was limited by law to 45. In contrast, U.S. class sizes, according to NEA (1982), averaged 25 at the elementary level and 23 at the secondary level during the 1980-81 school year.

Assuming that larger classes are harder to teach, one might argue that a comparison of average salaries understates salaries in Japan, relative to the magnitude of the teaching job. But observers of the Japanese scene seem to agree that it is much easier to maintain discipline and classroom control in Japan than in the U.S., notwithstanding that Japanese classes are larger. While some burdens of teaching undoubtedly do increase with class size (e.g., the burdens of dealing with students' individual problems and grading students' work), we cannot judge whether teaching a large Japanese class is, on balance, a more difficult job than teaching a smaller class in the U.S.

Nonsalary Compensation

Salary is the largest single element but not the only element of teacher compensation. Other forms of compensation include pensions, medical insurance, disability pay, survivors' benefits, and, at least in Japan, an array of social services. In principle, a comparison of the rewards to teaching should take these fringe benefits into account, but compiling the data (especially for the decentralized U.S. school system) would be a major undertaking, far beyond the scope of this study. We limit ourselves, therefore, to commenting on a few salient features of nonsalary compensation in Japan.

Retirement benefits are the largest component of nonsalary compensation. A teacher in Japan, upon retiring at age 60, receives a lump-sum payment equal to more than two years of salary plus annual pension payments ranging from 40 to 70 percent of "last salary," depending on length of service (Ministry of Education, Science and Culture, 1982).[20] Although we have no data on the average retirement benefits received by U.S. teachers, it seems that the provisions of the Japanese system are generous by U.S. standards, especially taking into account the high last-salary figures on which pensions are based.[21] Considering also that the Japanese retirement age is earlier (60 rather than 65) and that the Japanese life expectancy is longer, it seems clear that retirement benefits constitute a larger supplement to salary in Japan than in the U.S. On this score, a comparison of salaries alone understates the relative rewards to teaching in Japan.

In addition to retirement income, Japanese teachers receive a wide variety of fringe benefits under government-subsidized mutual aid schemes. These include long-term benefits such as disability pay and survivor's annuities, short-term benefits such as medical and child care expenses and sick pay, and various welfare services. As of 1982, teachers contributed 8.87 percent of their salaries and employers contributed an additional 10.92 percent to finance these benefits (Ministry of Education, Science and Culture, 1982). To compare benefit levels between Japan and the U.S., it would be necessary to estimate the average values of annual benefits

---

[20]According to information provided by Shogo Ichikawa (personal communication), the lump-sum retirement benefit averaged ¥16,460,000 in 1983-84, or approximately $73,000.

[21]As we shall see in Section IV, the salaries of the most senior Japanese teachers were well over $30,000 in 1983-84, which is substantially higher than the average levels for equally senior teachers in the U.S.

received by teachers in each country and then to balance the benefits against the corresponding salary deductions. We have neither the data nor the resources to undertake such a task.

Intangible Benefits of Teaching

Ideally, one would want to allow in a comparative analysis of the economic status of teachers for intangible as well as tangible benefits (and costs) of teaching. One such benefit is the prestige (or lack thereof) of being a teacher. Anecdotal evidence suggests that teachers in Japan are accorded higher prestige and greater respect than teachers in the United States, but we have no data on the subject. If the Japanese teacher's status is indeed higher in this respect, a comparison limited to salaries would understate the rewards to teaching in Japan, relative to those in the U.S.

Another important intangible benefit is the personal satisfaction derived from teaching. Although some survey data on teacher satisfaction are available for the U.S. and, we believe, for Japan as well, we do not have comparable data for the two countries. Even if we did, it seems unlikely that such data could be used to construct overall "satisfaction scores" for teachers, much less to adjust the salary data. Realistically, one can do little more than keep the intangible rewards of teaching in mind when comparing the more tangible benefits between countries.

IV. COMPARISONS OF SALARY LEVELS AND SCHEDULES

In this section, we compare Japan and the United States with respect to (a) average teachers' salaries and recent salary trends, (b) relationships between salaries and teacher seniority, and (c) salaries paid to teachers with specified standard qualifications. Such comparisons presuppose an ability to convert Japanese yen into equivalent U.S. dollars, and so, before discussing comparative salaries, we explain briefly how we handle the conversion problem.

YEN-TO-DOLLAR CONVERSIONS

There is more than one way to define the dollar equivalent of a Japanese salary expressed in yen, but we choose to define it in terms of the teacher's purchasing power, or ability to consume.[22] The dollar equivalent of a given yen salary, by this definition, is the number of dollars that would be required in the United States to attain a level of consumption equivalent to that obtained by the salary earner in Japan. There are two major reasons why currency conversions based on ordinary commercial, or market, exchange rates do not yield proper estimates of these consumption equivalents. One is that market exchange rates reflect directly only the relative prices of goods traded internationally, which do not include many important items (e.g., housing) in the market basket of the typical teacher or consumer. The other is that market rates are strongly affected by

[22]One alternative is to define the dollar equivalent of a yen salary as the number of dollars required to buy equivalent teacher services, or an equivalent amount of "teaching." Although it would be interesting to pursue this concept of equivalency, the theoretical and practical difficulties of doing so are immense (knowledge of teachers' productivity in both countries would be required) and we cannot deal with them in this study.

factors other than the relative purchasing power of the respective national currencies, such as interest rates, stability of financial conditions, and economic expectations in each country.[23] Consequently, we require, instead of market rates, conversion factors that reflect the relative consumption purchasing power of the two national currencies—that is, the ratio of the cost of a given consumption standard in yen to the cost of the same consumption standard in dollars.

Fortunately, such conversion factors have been developed. They are known as purchasing power parity (PPP) exchange rates to distinguish them from the more familiar market rates. Estimates of PPP rates have been produced over the years by the United Nations International Comparison Project (ICP), based at the University of Pennsylvania, and more recently by the United Nations Statistical Office and the Organization for Economic Cooperation and Development (OECD). They are used regularly for making international economic comparisons by OECD, the European Economic Community (EEC), and the U.S. Bureau of Labor Statistics (BLS), and we use them here for our comparisons of teachers' salaries. To be more precise, we use consumption PPP rates, which pertain specifically to the relative costs of the market baskets of goods purchased by consumers (there are also PPP rates for gross domestic product and its major nonconsumption components).

In broadest outline, PPP rates are constructed by measuring the prices of many individual commodities in each country and then computing an appropriately weighted sum of the individual relative prices. A massive data collection and computational effort is required to accomplish the

---

[23]For discussions of the shortcomings of market exchange rates for making international economic comparisons, see the review articles of Kravis (1984) and Marris (1984).

task. The most recent "benchmark" year—that is, a year for which the detailed price data have been collected—is 1980, but rates for subsequent years have been calculated by extrapolation, taking into account the inflation rates in each country. Full descriptions of the methodology are presented in Kravis, Heston, and Summers (1982) and Ward (1985); a summary, together with recent results, is given in Hill (1984).

Table 4 shows consumption PPP exchange rates between Japanese yen and U.S. dollars for 1980 through 1984 and, for comparison, market exchange rates for the same years. The two rates differ by up to 9 percent, depending on the year. Thus, it makes a significant difference whether one uses the PPP or market rates, especially in examining changes in relative purchasing power over time. Note, especially, that the rates "cross over" between 1981 and 1982. That is, before 1981 the dollar was undervalued relative to the yen in terms of purchasing power equivalency, while since 1982 it

Table 4

YEN-TO-DOLLAR CONVERSION RATES

Year	Market Exchange Rate	Consumption PPP Rate	Ratio: PPP Rate/ Market Rate
1980	227	248	1.09
1981	221	239	1.08
1982	249	232	0.93
1983	238	227	0.95
1984	238	225	0.95

Sources: OECD (PPP rates); International Monetary Fund (market exchange rates).

has been overvalued. Thus, the dollar-equivalent salaries of Japanese teachers would be underestimated from 1982 through 1984 if one used market exchange rates, whereas they would be overestimated during the earlier years.

COMPARISONS OF AVERAGE SALARIES AND RECENT TRENDS

Table 5 presents estimates of average teacher salaries in Japan and the United States during 1983-84. The U.S. figures are estimates produced by the National Education Association, as published in NCES (1985). The Japanese yen salary figures have been constructed from survey data published by the Ministry of Home Affairs, showing amounts received by teachers at the primary/lower secondary and upper secondary levels from basic salaries, bonuses, and allowances. The average salary shown for all teachers combined, ¥4,695,000, is a weighted average, in which the numbers of teachers at

Table 5

COMPARISON OF AVERAGE TEACHER SALARIES IN JAPAN AND THE UNITED STATES, 1983-84

Level	U.S. Average Salary ($)	Japan Average Salary (1,000 yen)	Japan Average Salary (Equiv. $)	Japan as Percent of U.S.
Elementary/lower secondary (Japan); elementary (U.S.)	21,452	4,577	20,254	94
Upper secondary (Japan); secondary (U.S.)	22,667	5,037	22,290	98
All levels combined	22,019	4,695	20,775	94
All levels combined, U.S. data adjusted to Japanese school year	21,476	4,695	20,775	97

Sources: U.S. salaries—NCES (1985); Japanese salaries—Ministry of Home Affairs (1985).

the respective levels are the weights. Japanese yen salaries have been converted to dollar equivalents at the rate of 226 yen per dollar, which is a weighted average of the PPP rates for 1983 and 1984. In the first three rows of Table 5, the U.S. figures are for the U.S. 1983-84 school year (September 1983 through June 1984), while the Japanese figures are for the Japanese school year, which runs from April 1983 through March 1984. In the final row, we have adjusted for the difference in school calendars by calculating a U.S. salary average that corresponds to the Japanese school year—that is, a weighted average of U.S. average salaries for 1982-83 and 1983-84. This adjustment, we believe, yields a more valid comparison, since the Japanese and U.S. salary figures apply to the same period. Details of all the calculations are given in Technical Note 2.

The principal finding from this comparison is that absolute levels of average teacher pay, measured in units of equivalent purchasing power, are nearly equal in Japan and the United States. The average dollar-equivalent Japanese salary is $20,775 and the average U.S. salary is $21,476. The 3-percent difference between the two is too small to be deemed significant, given the assumptions on which the estimates depend and the potential errors these assumptions create. Since per capita economic output, income, and consumption are all considerably lower in Japan than in the United States, such equality of dollar-equivalent pay implies that Japanese teachers enjoy a significantly higher relative economic status (i.e., relative to nonteachers in their own country) than do teachers in the U.S. These relative differences in pay are explored in Section V.

In Table 6, we compare trends in average salaries in the two countries over the 5-year period 1979-80 to 1983-84. The data sources and methods

Table 6

COMPARISONS OF AVERAGE TEACHER SALARIES IN JAPAN AND THE UNITED STATES, 1979-80 to 1983-84

Quantity	1979-80	1980-81	1981-82	1982-83	1983-84
U.S. average salary ($)[a]	15,580	16,946	18,592	20,113	21,476
Japan average salary (1,000 yen)	4,087	4,223	4,405	4,551	4,695
Japan average salary (equivalent dollars, converted at PPP rates)	16,090	17,168	18,588	19,702	20,775
Japan average salary as percent of U.S. average salary	103	101	100	98	97
Exhibit: relative salaries with yen converted to dollars at market exchange rates					
Japan average salary (dollars, converted at market rates)	18,493	18,676	19,320	18,481	19,727
Japan average salary as percent of U.S. average salary	119	110	104	92	92

Sources: Ministry of Home Affairs surveys of earnings of non-national government employees (various years). See Technical Note 2 for details of computations.

[a]Estimated U.S. average salary for period corresponding to Japanese school year.

used to generate the table are the same as those outlined above in connection with Table 5. Salary data for the U.S. are computed from NEA estimates reported in NCES (1985). Salary data for Japan are from annual reports on salaries of employees of subnational governments published by the Ministry of Home Affairs (various years). The PPP exchange rates used to convert yen to equivalent dollars are weighted averages of the calendar-year PPP rates shown in Table 4. The U.S. salary figures have been adjusted to correspond to the April-March Japanese school year. All calculations are explained in Technical Note 2.

The figures in Table 6 confirm that absolute levels of teacher pay have generally been similar in Japan and the United States in recent years. They also indicate that Japanese teachers' salaries were formerly higher in purchasing power than American salaries and have only recently declined to equal or lower levels. This decline is attributable to an unusually slow rate of growth in Japanese teachers' salaries during the early 1980's--specifically, an improvement in scheduled salaries of only about 5.5 percent between 1981 and 1984.[24] It can be seen from Table 6 that between 1979-80 and 1983-84, while the average U.S. salary rose by 38 percent, Japanese salaries increased by only 15 percent, measured in yen, or by 29 percent, measured in equivalent dollars; hence the falling level of salaries in Japan relative to that in the U.S.[25]

The bottom portion of Table 6, labeled "exhibit," illustrates why it is essential to convert yen to dollars according to PPP rates rather than market exchange rates. According to the market-rate conversion, the dollar-equivalent average teacher's salary in Japan appears to have fallen from 119 percent to 92 percent of the U.S. level in only four years--a 23 percent decline. It is easy to show, however, that so rapid a change in

---

[24]The 5.5 percent figure is our estimate of the average difference between the scheduled salaries effective April 1984 and those effective April 1981 for teachers of given seniority and degree level (salary schedules provided by the Ministry of Education, Science and Culture and National Institute for Educational Research). We have also learned independently that teachers' salary schedules were frozen by the government in 1982 and permitted to increase by only 2.0 and 3.4 percent, respectively, in 1983 and 1984 (personal communication, Shogo Ichikawa, National Institute for Educational Research).

[25]Note that had there been no change at all between 1979-80 and 1983-84 in yen salaries in Japan, the level of dollar-equivalent Japanese salaries would have risen by about 12 percent solely because of the falling PPP exchange rate between dollars and yen.

relative purchasing power is not merely implausible but arithmetically impossible. According to OECD data (1984b, 1985), consumer prices increased by nearly 17 percent in Japan and over 34 percent in the U.S. during the period in question. The 15 percent increase in Japanese teachers' salaries over the 4-year period translates, therefore, into a loss of about 2 percent in purchasing power, while the 38 percent gain in U.S. salaries amounts, after inflation, to a real increase of about 3 percent. Consequently, teachers' purchasing power in Japan fell by about 5 percent relative to teachers' purchasing power in the U.S. This is compatible with the PPP-based relative salary estimates shown in Table 6 but totally inconsistent with the estimates based on market exchange rates. In sum, market-rate conversions of yen salaries into dollars yield seriously distorted, if not nonsensical, comparisons of salary levels between the two countries.[26]

THE RELATIONSHIP OF TEACHER PAY TO SENIORITY

We have shown in Section III how the salary schedule of each country (a synthesized schedule in the case of the U.S.) links teacher salary to seniority. Now we use those salary schedules to compare salary-seniority relationships between the U.S. and Japan. These relationships are characterized in terms of relative salary indices in Table 7 and in terms of absolute dollar, or dollar-equivalent, salaries in Table 8 and Figure 1.

---

[26]A more graphic illustration is provided by the sharp rise that has just occurred in the value of the yen relative to the dollar—from about 250 yen per dollar in June 1985 to 202 yen per dollar at the end of December 1985. On the basis of market exchange rates, it would appear that dollar-equivalent teachers' salaries in Japan have risen by 23 percent during a 6-month period. Such a finding is absurd, however, since in fact the purchasing power of a Japanese teacher remained nearly constant over the period (salary being fixed and inflation being low), and it illustrates the unsuitability of market exchange rates for making such comparisons.

The salary indices in Table 7 express the salary in each country at each selected level of seniority as a multiple of the corresponding starting salary. The entries for Japan, calculated from the national salary schedule in Table 1, reflect the relationship between monthly base pay and years of service.[27] The entries for the U.S., calculated from the synthesized salary schedule in Table 3, reflect the previously discussed shortcomings of the synthesis procedure.[28] Subject to these reservations, we note that the rates at which salaries increase with seniority are roughly the same in the two countries during the first 10 years of teaching, but U.S. salaries "top out" somewhere between the tenth and fifteenth years of service, while Japanese salaries continue to increase throughout the teachers' careers. The range of salary variation in Japan from the highest end to the lowest end of the seniority scale is about 3 to 1 for teachers with bachelor's degrees (somewhat higher for upper secondary teachers than for elementary or lower secondary teachers), as compared with about 1.7 to 1 in the U.S. Note that salaries rise more rapidly in the U.S. for teachers with master's than bachelor's degrees, while the opposite is true in Japan. Thus, the advantage of a master's degree diminishes with seniority in Japan but is reinforced by seniority in the United States.

---

[27]The annual bonus and some allowances received by Japanese teachers are proportional to base salary, but certain other allowances, such as the family allowance and the allowances paid for special duties and assignments, probably grow more rapidly. Consequently, the indices shown in the table probably understate slightly the rate at which total salary increases with years of service in Japan.

[28]In particular, the index numbers shown for the U.S. reflect the assumption that salary schedules top out before the 20-year point. While this is true for nearly all the local salary schedules we have examined, we recognize that there are instances of school systems that reward seniority in excess of 20 years. Consequently, the true relationship, while nearly flat after 20 years, is not as perfectly flat as the table indicates.

Table 7

INDICES OF RELATIVE PAY AT VARIOUS LEVELS OF SENIORITY, JAPAN AND THE UNITED STATES, 1983-84 (Starting Salary at Specified Level of Training = 100)

Years of Service	Index of Relative Pay			
	Teachers with Bachelor's Degrees		Teachers with Master's Degrees	
	U.S.	Japan[a]	U.S.	Japan[a]
1	100	100	100	100
5	119	123	121	120
10	147	152	149	146
15	[b]	184	[b]	174
20	165	217 217	173	200 201
25	165	246 249	173	222 226
30	165	269 276	173	239 246
35	165	287 296	173	259 272
37	165	297 308	173	263 281

Sources: Salary schedules in Tables 1 and 3.

[a]Where there are two entries in the Japan column, the first is for elementary and lower secondary teachers and the second for upper-secondary teachers.

[b]U.S. index values are uncertain at the 15-year level of experience because we lack data on the points at which individual district salary schedules "top out."

To appreciate the distributional implications of these patterns, recall that Japanese teachers are much more heavily concentrated at both ends of the seniority spectrum than are American teachers. As mentioned earlier, more than 40 percent of all Japanese teachers had at least 20

years of experience in 1981, and 20 percent had fewer than 5 years of experience, as compared with 22 percent and 14 percent, respectively, in the U.S. The variance in teacher experience is greater in Japan. This, in combination with the greater variability of Japanese salaries with seniority, implies that there are larger seniority-based disparities in pay in Japan among teachers working in the same communities and schools than one would find in the United States. (This does not mean that Japanese pay disparities are greater on a national scale, since the larger seniority-based pay disparities in Japan may be balanced out, or more than balanced out, by the larger geographical disparities in the United States.)

Table 8 and Figure 1 provide direct comparisons of the dollar and dollar-equivalent salaries received in 1983-84 by U.S. and Japanese teachers at specified levels of seniority. For this comparison, the Japanese salary associated with each seniority level has been calculated by (a) annualizing the scheduled monthly base salary and (b) scaling up the annual base salary to allow for bonuses and allowances. The multipliers used for the latter adjustment, 1.638 for elementary and lower secondary teachers and 1.661 for upper secondary teachers, have been computed from data provided in Ministry of Home Affairs (1985). The resulting total salary figures have then been converted to equivalent dollars, using the same PPP conversion factor, 226 yen per dollar, as in the average-salary comparison for 1983-84.

These displays show that Japanese salaries are below U.S. salaries during the early years of teaching but substantially higher later in the teaching career. A Japanese elementary or lower secondary teacher with a 4-year degree is paid about 76 percent as much as his or her U.S. counterpart upon entry into teaching. This ratio increases only slightly, to 78 percent,

Table 8

SALARY AS A FUNCTION OF DEGREE LEVEL AND SENIORITY, JAPAN AND THE UNITED STATES, 1983-84

Years of Svce.	United States ($)		Japan (1,000's of Yen)				Japan (Equivalent Dollars)			
			Elementary, Low Secondary		Upper Secondary		Elementary, Low Secondary		Upper Secondary	
	B.A.	M.A.	B.A.	M.A.	B.A.	M.A.	B.A.	M.A.	B.A.	M.A.
1	13,764	14,782	2,350	2,757	2,384	2,797	10,399	12,199	10,549	12,374
5	16,367	17,897	2,893	3,296	2,934	3,343	12,799	14,582	12,983	14,791
10	20,172	21,988	3,563	4,013	3,614	4,070	15,764	17,756	15,991	18,010
15	a	a	4,329	4,789	4,391	4,858	19,156	21,190	19,430	21,494
20	22,725	25,914	5,094	5,516	5,171	5,635	22,538	24,407	22,879	24,934
25	22,725	25,914	5,776	6,121	5,928	6,335	25,555	27,086	26,231	28,030
30	22,725	25,914	6,330	6,589	6,588	6,883	28,007	29,155	29,150	30,455
35	22,725	25,914	6,735	7,065	7,046	7,483	29,799	31,259	31,179	33,110
37	22,725	25,914	6,974	7,196	7,345	7,742	30,859	31,842	32,502	34,257

Sources: Salary schedules in Tables 1 and 3.

[a]U.S. salary values are uncertain at the 15-year level of experience because we lack detailed data on when individual district salary schedules "top out."

by the tenth year of teaching. At around the twentieth year, however, the pay gap disappears, and from then on, Japanese dollar-equivalent salary levels are higher. (For teachers with master's degrees, the cross-over point comes a few years later.) By the thirtieth year of teaching, Japanese elementary and lower secondary teachers with bachelor's degrees earn 23 percent more, and Japanese upper secondary school teachers earn 28 percent more, than comparable teachers in the U.S.; and by the thirty-seventh

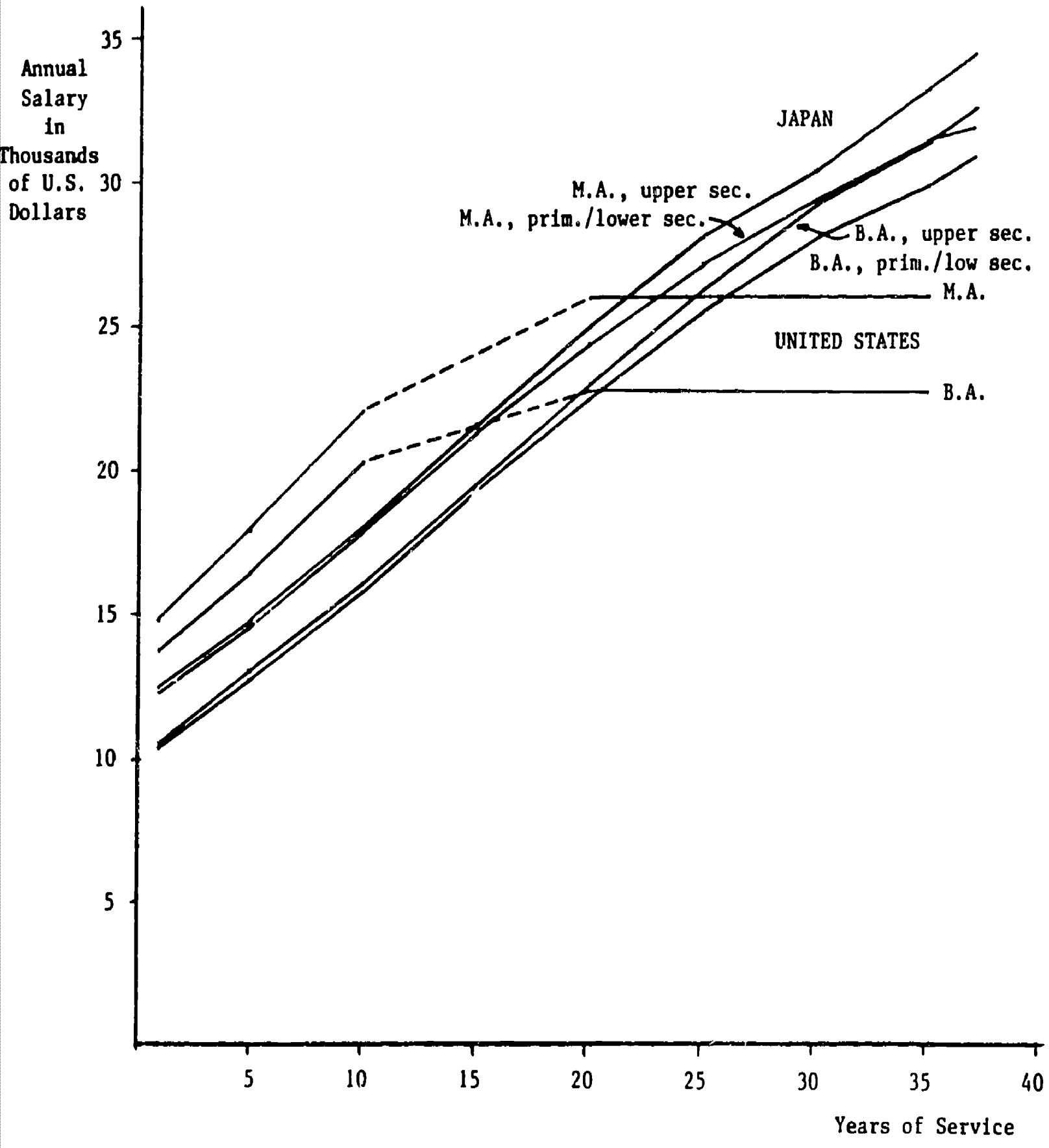

Fig. 1. Teachers' Salaries in Relation to Seniority and Highest Degree Earned, Japan and the United States, 1983-84.

year, these margins grow to 36 and 43 percent, respectively. For convenience, the ratios of Japanese to U.S. salaries at various levels of seniority, by level of education and degree, are displayed in Table 9.

Table 9

RATIOS OF JAPANESE TO U.S. TEACHERS' SALARIES, VARIOUS LEVELS OF SENIORITY AND TRAINING, 1983-84

Years of Service	Elementary, Low Secondary		Upper Secondary	
	B.A.	M.A.	B.A.	M.A.
1	.76	.83	.77	.84
5	.78	.81	.79	.83
10	.78	.81	.79	.82
20	.99	.94	1.01	.96
30	1.23	1.13	1.28	1.18
37	1.36	1.23	1.43	1.32

Source: Table 8.

Several points should be considered in interpreting and assessing these comparisons. First, the data for Japan in Tables 7-9 and Figure 1 reflect the implicit assumption that the ratio of bonuses and allowances to base salary does not vary with years of service. As noted earlier, this assumption is not strictly correct—for instance, the ratio of family allowances and special-duty allowances to base pay probably increases with seniority. Treating the ratio as constant understates the rate at which total salary rises with seniority. Second, no allowance has been made in these displays for rules that allow some Japanese teachers to advance more rapidly than one step per year up the salary scale. As mentioned earlier

(footnote 7), some teachers are rewarded by special advancement, and consequently the actual salary-seniority relationship is steeper than the salary schedule suggests. Third, the data have not been adjusted to take into account the later starting date of the U.S. school year. Such an adjustment would reduce slightly the salary entries for the U.S. relative to those for Japan. Fourth, no allowance has been made for teachers who hold more than an M.A. degree. There are significant numbers of such teachers in the U.S. (teachers who have reached the M.A. + 30 unit, M.A. + 60 unit, or doctorate levels of school distict pay scales) but virtually none in Japan. The first three points all imply that the relative level and/or steepness of the Japanese salary-seniority curve is understated by the data presented above. It may well be, therefore, that senior teachers in Japan are even better paid relative to their U.S. counterparts, and that the cross-over between Japanese and U.S. salaries occurs somewhat earlier in the teaching career, than one would infer from the data presented above.

We also note once again that the U.S. salaries in these displays are all based on the synthesized pay scale presented in Section III, and hence their validity depends on the validity of the assumptions and data underlying that supposedly typical U.S. salary schedule. Strictly speaking, we have compared the Japanese salary structure only against the pattern characteristic of 78 large, mainly urban, mainly northeastern U.S. school districts. An analysis based on data from a broader sample of U.S. school districts could yield different results.

Finally, we note the connection between these findings about Japanese and U.S. salary structures and the previously stated findings about relative salary levels. The near-equality of average teachers' salaries in Japan

and the United States does not reflect an underlying similarity of salary structures. Instead, it results from the interaction between two structural differences: one, the difference in shapes of the respective national salary schedules, namely, that the Japanese schedule starts lower than the U.S. schedule but continues to rise after the U.S. schedule levels off; the other, the difference in the seniority distributions of Japanese and U.S. teachers. Japanese teachers, as noted earlier, are much more concentrated than U.S. teachers in the highest seniority brackets, in which Japanese dollar-equivalent salaries are higher than dollar salaries in the United States. It is the interaction between this concentration and the steeper Japanese salary schedule that accounts for the equality of salary averages. If seniority distributions were the same in the two countries, the average teacher's salary in Japan would be significantly below that in the U.S., despite the high salaries paid to teachers with 20 or more years of service in Japan.

V. COMPARISON OF RELATIVE TEACHERS' SALARIES

The economic status of teachers in their own countries is more a matter of relative than absolute earnings. What counts is how teachers' salaries compare with pay levels in other occupations and with general levels of income and consumption in the national economy. We turn next, therefore, to comparisons of the relative positions of teachers' salaries in Japan and the United States. Because of data limitations, these comparisons are less extensive than we would have wished. For example, we were not able to obtain comparable indicators of Japanese and U.S. salaries for broad aggregate categories, such as white-collar or professional occupations, nor for certain professions of interest, such as accountants or engineers. Nevertheless, the comparisons presented here do suffice, we believe, to place in perspective the salaries reported in Sections III and IV and to convey an impression of teachers' relative positions on the Japanese and U.S. economic ladders.

TEACHERS' SALARIES RELATIVE TO GENERAL LEVELS OF ECONOMIC ACTIVITY

We first compare teachers' salaries in each country against levels of per capita gross domestic product (GDP), national income, and consumption. The 1983 values of these indicators and the ratios of 1983 average teachers' salaries to each indicator are presented in Table 10.[29] The results are clear-cut and striking. Japanese teachers are paid considerably more

[29]For the purpose of this comparison, we have calculated average teachers' salaries for calendar year 1983 by computing weighted averages of average salaries during the 1982-83 and 1983-84 school years. Consequently, the average salary figures shown in Table 10 are slightly lower than those given in the tables in Section IV, which pertain to the April 1983-March 1984 Japanese school year.

Table 10

TEACHERS' SALARIES RELATIVE TO LEVELS OF ECONOMIC ACTIVITY, JAPAN AND THE UNITED STATES, CALENDAR YEAR 1983

Quantity	U.S. (dollars per capita)	Japan (1,000 yen per capita)
Average teachers' salary, calendar year 1983	21,237	4,659
Gross Domestic Product (GDP)	13,969	2,302
National Income	12,307	1,963
Consumption	9,243	1,367
Ratio: Salary/GDP	1.52	2.02
Ratio: Salary/National Income	1.73	2.37
Ratio: Salary/Consumption	2.30	3.41

Sources: Salaries—Table 5; Economic variables—OECD (1984a).

relative to all three indicators than are teachers in the United States. The average salary of a Japanese teacher is 33 percent higher relative to per capita GDP, 37 percent higher relative to per capita national income, and 48 percent higher relative to per capita consumption than the average salary of a U.S. teacher. The average teacher, in other words, has the power to purchase a significantly greater share of his or her country's goods and services in Japan than in the United States. (The reason that the Japanese teacher's relative advantage appears greater when salaries are compared against consumption than when they are compared against GDP or national income is that the saving rate is much higher in Japan than in

the U.S., leaving a smaller fraction of GDP or income for consumption in Japan.)

Recent trends in these relative positions are shown in Table 11. It can be seen that although the Japanese teacher's relative position is higher than the U.S. teacher's throughout the 1979-1983 period, the Japanese teacher's advantage is smaller than a few years ago. The ratio of average salary to per capita GDP was 33 percent higher in Japan than in the U.S. in 1983 but 48 percent higher in 1979; the Japanese ratio of average salary to national income exceeded the U.S. ratio by 37 percent in 1983, as compared with 53 percent in 1979; and the Japanese ratio of average salary to consumption, which was 48 percent greater than the U.S. ratio in 1983, had been 61 percent greater in 1979.

Table 11

RATIOS OF TEACHERS' SALARIES TO ECONOMIC INDICATORS, JAPAN AND THE UNITED STATES, 1979-83

	Salary/ Per Capita GDP		Salary/ Per Capita National Income		Salary/ Per Capita Consumption	
Year	U.S.	Japan	U.S.	Japan	U.S.	Japan
1979	1.45	2.15	1.63	2.49	2.30	3.70
1980	1.45	2.07	1.64	2.39	2.26	3.56
1981	1.43	2.03	1.62	2.37	2.26	3.53
1982	1.51	2.02	1.72	2.36	2.31	3.44
1983	1.52	2.02	1.73	2.37	2.30	3.41

Sources: Table 6; OECD (1984a).

This fractional diminution of the Japanese advantage reflects mainly the low rate of improvement in Japanese teachers' salaries during the last few years—specifically, the salary freeze in 1982 and the low rates of increase in scheduled salaries in 1983 and 1984 (see footnote 24). The ratios of U.S. teachers' salaries to per capita output, income, and consumption have risen slightly over the period, while the Japanese ratios have fallen. Thus, the relative economic status of the Japanese teacher, though superior to that of the U.S. teacher, has been declining, while the relative status of U.S. teachers has been maintained and, since 1981, has begun to improve.

The ratios shown in Tables 10 and 11 pertain only to average salaries and do not apply uniformly to teachers at different stages of their careers. Starting salaries are lower relative to average salaries in Japan than in the U.S. Consequently, recently hired teachers in Japan are not as well off relative to recently hired U.S. teachers as the tables suggest, while senior Japanese teachers occupy more favorable positions than the tables indicate. The relationship between relative economic status and seniority is brought out in Table 12, which displays the ratios of salary to GDP, income, and consumption corresponding to selected numbers of years of service.

It can be seen from this table that the relative economic status of the Japanese teachers is only slightly superior to that of U.S. teachers at the outset and only moderately higher after 10 years of service. By the twentieth year, however, the relative position of the Japanese teacher is 36 to 52 percent higher than that of the U.S. teacher, depending on which indicator one selects; and by the thirty-fifth year, the Japanese teacher's advantage is in the range of 80 to 100 percent. Based on the

Table 12

RATIOS OF TEACHER SALARY TO ECONOMIC INDICATORS, SELECTED LEVELS OF SENIORITY, JAPAN AND THE UNITED STATES, 1983[a]

Years of Service	Salary/ Per Capita GDP		Salary/ Per Capita National Income		Salary/ Per Capita Consumption	
	U.S.	Japan	U.S.	Japan	U.S.	Japan
1	.99	1.02	1.12	1.20	1.49	1.72
10	1.44	1.55	1.62	1.82	2.18	2.61
20	1.63	2.21	1.85	2.60	2.46	3.73
35	1.63	2.93	1.85	3.43	2.46	4.93

Sources: Table 8; OECD (1984a).

[a]Ratios are based on the salaries of teachers with bachelor's degrees and, in the case of Japan, on salaries of elementary and lower secondary teachers.

latter difference, it seems fair to say that senior teachers in Japan have access to a relative standard of living not attainable by equally senior teachers in the United States.

The foregoing comparisons have properties that make them potentially misleading, and it is important to use and interpret them with appropriate caution. One limitation is that the ratios in Tables 10 through 12 are only partial indicators of the relative economic status of teachers in that they do not take into account teachers' income from sources other than their teaching salaries. The omission of outside earnings tends to exaggerate the relative economic status of teachers in Japan, since Japanese teachers have fewer opportunities than U.S. teachers to supplement their salaries with earnings from summer employment and second jobs.

A second problem is that the comparisons pertain only to the relative earnings of teachers themselves and not to the relative economic positions of teachers' households. The effects of this limitation are unclear. The relationships between relative individual earnings and relative household incomes are complex, involving aspects of family structure, male-female labor force participation, and male-female earnings differentials in each country. It seems likely, for example, that the economic position of Japanese male teachers' households relative to U.S. male teachers' households is less favorable than the relative salary figures suggest, since married male teachers in the U.S. are probably more likely to have working wives, and the U.S. working wives are likely to be relatively better paid than working wives in Japan. On the other hand, Japanese female teachers may be more likely than U.S. female teachers to be in households with employed husbands. All this is speculative, however, since we lack data on incomes of teachers' households, and we do not know how spouses earnings and other factors balance out. We can only say that relative salaries do not necessarily give a complete picture of the relative standards of living of teachers and their families in the United States and Japan.

A third limitation is that we have compared relative before-tax salaries in the two countries, whereas teachers' relative standards of living depend more directly (or so it can be argued) on relative after-tax incomes.[30]

---

[30]The argument to the contrary is that "standard of living," broadly defined, includes both private consumption and collective consumption through the public sector. Hence, total household income, including income taxed away to finance public services (i.e., before-tax income), is a better indicator than after-tax income. However, this proposition applies better to the population as a whole than to a particular group like teachers. To take collective consumption into account properly, one would have to analyze the public service benefits received by teachers in each country—a matter on which we have no data for either the U.S. or Japan.

We do not have data on the after-tax incomes of teachers in either country. We do know, however, that the overall rate of taxation is lower in Japan than in the United States (OECD, 1984b) and, more specifically, that tax burdens in teachers' income brackets are lighter under the Japanese than the U.S. income tax system (OECD, 1984c). It appears, therefore, that the ratios in Tables 10 through 12 understate the advantage in relative after-tax earnings enjoyed by teachers in Japan.

TEACHERS' SALARIES RELATIVE TO SALARIES IN OTHER OCCUPATIONS

Another way to assess the relative economic conditions of teachers is to compare teachers' salaries against salaries in other specific occupations and occupational groups. Unfortunately, gaps in the data and intercountry differences in definitions of occupational categories limit the comparisons that can be made. In addition, problems of data compatibility raise doubts about the validity of certain comparisons. Nevertheless, we believe that the comparisons presented here, albeit fragmentary, do enrich the picture of how teachers are rewarded, relative to other workers, in the United States and Japan.

Two indicators of general wage levels in different countries are published regularly by the ILO: the average wage in manufacturing and the average wage in nonagricultural activities. Teachers' salaries can be compared with both, and the resulting ratios can be compared across countries. However, there are two problems in making such comparisons between the U.S. and Japan. First, the ILO data for the two countries are reported in different units—hourly earnings for the U.S. and monthly earnings for Japan (ILO, 1984). Consequently, assumptions about average hours of work

must be introduced to produce comparable figures. Second, and more troublesome, the ILO data for the U.S. and Japan are not for the same categories of workers. The Japanese figures cover both salaried and hourly workers, while the U.S. data pertain to hourly, or "production," workers only. Fortunately, we have data from a Japanese source (Ministry of Labor, 1985) that allow us to infer the wage rate of production workers in Japanese manufacturing and hence to compare teachers' salaries to manufacturing production workers' wages in both Japan and the U.S.; but unfortunately, we have no similar data on wages of workers in nonagricultural activities, and consequently that part of the comparison is cruder.

Ratios of teachers' salaries to the two general wage indicators are shown in Table 13. We have annualized the 1983 hourly wage rates reported by the ILO for the U.S. ($8.83 per hour in manufacturing and $8.02 per hour in all nonagricultural activities) by multiplying each rate by 40 hours per week and 52 weeks per year. We have also annualized the ILO estimates of monthly earnings in Japan and then scaled down the estimate of annual earnings in manufacturing, by a percentage calculated from Ministry of Labor data, to reflect the earnings differential between production workers and all manufacturing employees.[31] Lacking the data to derive a similar scaling factor for the earnings of workers in nonagricultural activities, we applied the same factor as used for manufacturing workers. The resulting annual earnings figures are compared against estimated average teachers' salaries in calendar year 1983.

---

[31]The scaling factor is 0.87, based on annual earnings of ¥2,867,500 for production workers and ¥3,297,800 for all manufacturing employees. These figures are annualized weighted averages, based on data on monthly contract earnings and annual special earnings (mainly bonuses) reported separately for males and females in Ministry of Labor (1985).

Table 13

TEACHERS' SALARIES RELATIVE TO EARNINGS IN MANUFACTURING AND IN ALL NONAGRICULTURAL ACTIVITIES, UNITED STATES AND JAPAN, 1983

Quantity	United States ($)	Japan (¥1000)
Average annual earnings, production workers in manufacturing[a]	18,366	2,914
Average annual earnings, workers in nonagricultural activities[a]	16,682	3,104
Average teachers' salary, (calendar year 1983)	21,237	4,659
Ratio: teachers' salary to manufacturing earnings	1.16	1.60
Ratio: teachers' salary to earnings in nonagricultural activities	1.27	1.50

Sources: ILO (1984); Japan Ministry of Labor (1985); Tables 6 and 10.

[a]Earnings figures for U.S. are annualized hourly wage rates; figures for Japan are annualized monthly earnings, scaled down to offset inclusion of nonproduction workers.

This comparison shows that Japanese teachers are better paid than U.S. teachers relative to both categories of production workers but that the Japanese teacher's advantage is greater relative to those in manufacturing than to nonagricultural workers as a whole. Specifically, the ratio of the average teachers' salary to average annual earnings in manufacturing is 37 percent higher in Japan than in the U.S. (1.60 versus 1.16), while the corresponding ratio to earnings in nonagricultural activities is only 18 percent higher in Japan (1.50 versus 1.27). The reason for the

difference is clear: in the United States, wages are higher in manufacturing than in other sectors, while in Japan the ranking is reversed.[32] Consequently, the relative economic status of Japanese teachers appears less elevated when measured against earnings of all nonagricultural employees than when compared with manufacturing wages alone.

There are several potential sources of error in these comparisons. The procedure used to annualize U.S. hourly earnings data is somewhat arbitrary and may yield an overestimate of annual earnings, since the average worker probably is not paid for 52 40-hour weeks per year. It is possible that some allowances earned by Japanese workers have been omitted, thereby resulting in an overstated ratio of teachers' salaries to manufacturing earnings (the ILO source indicates that bonuses and family allowances are included in the Japanese data but does not refer to other allowances). There may be some inconsistencies between U.S. and Japanese practice, and between the ILO data and Japan Ministry of Labor data, in defining "manufacturing" and "production workers." It does not seem likely, however, that such errors could alter the general finding that teachers are better paid, relative to manufacturing and nonagricultural production workers, in Japan than in the United States.

When we turn from comparisons with general wage indicators to comparisons with salaries in specific nonteaching occupations, the conceptual and technical difficulties multiply. First, there are intercountry differences in methods of measuring salaries and earnings. In the Japanese case,

---

[32]According to the ILO data, earnings of U.S. production workers were 10 percent higher in manufacturing than in all nonagricultural activities in 1983 ($8.83 per hour, as compared with $8.02 per hour), while in Japan earnings were 6 percent lower in manufacturing than in the whole nonagricultural sector (¥279,100 per month, as compared with ¥297,300).

there is often ambiguity about which allowances are included in the reported earnings of workers other than teachers. In the U.S. case, there is the problem of translating hourly or weekly wage rates into annual earnings estimates compatible with the estimates of teachers' salaries. Moreover, the Japanese data on earnings in nonteaching, private-sector occupations are drawn from different sources than the data on earnings of teachers, thereby raising issues of data compatibility.[33] Second, occupational classifications differ between the U.S. and Japan, and occupational categories do not necessarily have the same definitions even when they have the same names. The taxonomic differences in the professional occupational categories are especially pronounced, which, in combination with data gaps in those categories, severely limits the comparisons we can make.[34] Third, even where category definitions are consistent, differences in work force composition within a given occupational category can threaten the validity of Japan-U.S. comparisons. For instance, the age or experience distribution within a given occupation may differ between the U.S. and Japan, creating an appearance of a pay differential that may obscure the actual differences in salary levels or structures between the countries. Given this array of problems, the comparisons presented below should be viewed cautiously and with some skepticism. There is no guarantee that the relative pay figures

---

[33]In the U.S. case, we have obtained earnings data for teaching and other occupations from a single source (cited below), but the earnings data for teachers are not comparable to the teacher salary data used elsewhere in this report.

[34]For instance, the Japanese classify "managers" according to level of responsibility—e.g., branch manager, division manager, plant manager, etc.—while the U.S. categories emphasize functional distinctions, such as personnel management and financial management. The BLS also makes distinctions based on responsibility or grade—e.g., accountant I, accountant II, etc.—but we have no way of calibrating these to the Japanese categories.

for any occupational category actually reflect comparable salaries of comparable workers performing comparable jobs.

Subject to the foregoing warning, we report, in Table 14, comparative data on earnings in teaching and in selected nonteaching occupations in the United States and Japan. The nonteaching occupations were selected on the basis of (a) availability of data from both countries on ostensibly similar job classifications, and (b) diversity of occupational types. However, limitations of both the Japanese and U.S. data sources have precluded appropriate representation of white collar and professional occupational categories. The U.S. data are taken from a recent article in Monthly Labor Review (Mellor, 1985) on earnings by occupation, which covered some 200 occupations, including both elementary and secondary teachers. The Japanese data have been extracted from private-sector occupational earnings figures published in the Japan Statistical Abtract (Japan Statistical Bureau, 1984) and Yearbook of Labour Statistics (Ministry of Labor, 1985). Each of these reports covers a different, limited, heterogeneous set of occupations (with emphasis on blue-collar categories). We do not know why certain job categories where selected for inclusion in the reports or why other categories were excluded. As already mentioned, these data on earnings in nonteaching jobs have had to be compared with teacher salary data from a different source (Ministry of Home Affairs, 1985), thereby creating potential problems of data incompatibility.

Although the U.S.-Japan differences in relative salaries vary considerably among the occupational categories, certain patterns do emerge. In general, Japanese teachers appear to be significantly better paid relative to workers in blue collar and manual occupations, including skilled crafts,

Table 14

TEACHERS' SALARIES RELATIVE TO SALARIES IN SELECTED OCCUPATIONS, UNITED STATES AND JAPAN, 1983

United States			Japan		
Occupation	Weekly Earnings ($)	Index[a]	Occupation	Monthly Contract Earnings (¥1000)	Index[a]
Teachers, elementary and secondary[b]	373	100	Teachers, elementary and secondary[c]	279	100
Nurse (F)[d]	371	99	Nurse (F)	219	79
Pharmacist	509	136	Pharmacist	217	78
Automobile salesman	345	92	Automobile salesman	214	77
Computer programmer	472	127	Computer programmer	206	74
Drafting occupations	369	99	Draftsman	238	85
Secretary (F)	251	67			
File clerk (F)	210	56	Clerk (F)	198	71
Typist (F)	237	64	Typist (F)	150	54
Data entry keyer (F)	238	64	Key puncher (F)	136	49
Guard	243	65	Watchman	222	80
Cook, exc. short order	172	46	Cook	216	78
Janitors and cleaners	220	59	Janitor	207	74
Electrician	424	114	Electrician	242	87
Lathe and turning machine operator	306	82	Lathe operator	229	82
Welder	354	95	Welder	226	81
Automobile mechanic	300	80	Automobile repairman	182	65
Truck driver, heavy	326	87	Truck driver	224	80
Taxi driver	246	66	Taxi driver	222	80
Assemblers (F)	226	61	Assembler, radio/TV (F)	111	40
Technician, electrical/ electronic	406	108	Technician[e]	259	93
Saleaworker, apparel (F)	157	42	Sales clerk, department store (F)	138	50
Cashier (F)	164	44	Cashier, supermarket (F)	125	45
Hairdressers and cosmeticians (F)	184	49	Hairdresser (F)	206	74
Managers, various[f]	531	142	Managers, administrative[g]	440	158
			Managers, technical[h]	412	148
Engineers	603	162	Engineers	N/A	N/A
Accountants/auditors	408	109	Accountants	N/A	N/A

Sources: U.S. salaries—Mellor (1985); Japanese salaries—Ministry of Labor (1984); Japan Statistics Bureau (1984).

Note: (F) indicates salary is for female employees only.

[a]Index = salary in named occupation as percentage of salary in teaching.

[b]Weighted average of salaries for elementary and secondary teachers.

[c]Weighted average of salaries for elementary/lower secondary and upper secondary teachers, adjusted to delete principals and vice-principals as per Technical Note 2.

[d]Weighed average of salaries for registered and licensed practical nurses.

[e]Includes chief technicians and technicians-in-charge.

[f]Weighted average of salaries for financial, personnel, purchasing, and marketing managers.

[g]Weighted average of salaries for branch managers, administrative department managers and assistant managers, and administrative section managers in private industry.

[h]Weighted average of technical department managers and managers and technical section managers in private industry.

than are U.S. teachers; i.e., the ratios of salaries in these occupations to teachers' salaries are lower for Japan. Note, in particular, that salaries in some of the selected occupations are higher than salaries of teachers in the U.S. but lower in Japan (e.g., technician, electrician, pharmacist, computer programmer). Teachers' salaries are also higher relative to clerical occupations (clerk, typist, key puncher) in Japan. For reasons unknown, however, the pattern does not hold in such female-dominated occupations as sales clerk, cashier, or hairdresser, where salaries are higher in Japan, relative to teachers' salaries, than they are in the U.S. By and large, however, the Japanese teachers are better paid than the U.S. teachers relative to employees in the occupations covered by the table.

A serious shortcoming of this set of comparisons is that it does not provide adequate coverage of professional occupations typically requiring college-level training, such as engineering, accountancy, and public administration. Salaries in such fields are frequently compared with teachers' salaries in pay comparability studies in the U.S., but we have been unable to obtain data that would allow meaningful intercountry comparisons. To illustrate what is missing, we have included at the bottom of Table 14 the salaries of U.S. engineers and accountants relative to those of teachers, but we cannot provide comparable figures for Japan. Also, to illustrate some of the difficulties of making comparisons in the professional categories, we have included data on certain managerial salaries in the two countries, together with notes indicating the differences in occupational taxonomy. We have no way of knowing whether the aggregated management categories in the table actually represent similar ranges of management jobs, and hence

we are disinclined to read any meaning into those comparative pay figures. To say anything definitive about the economic status of teachers compared with that of other professionals, we would need improved data on professional salaries in both Japan and the United States.

TECHNICAL NOTES

1. Synthesized Salary Schedule for the United States

The following procedure was used to construct an estimated average, or "typical" U.S. salary schedule from AFT data on the salary schedules of 78 AFT-represented school districts:

First, data were assembled on the salaries paid to teachers with certain standard levels of experience and training in each sample district. Specifically, we considered salaries paid to teachers with 1, 5, and 10 years of experience and the maximum number of years recognized in the district's salary schedule, and to teachers with bachelor's degrees, master's degrees, master's plus 30 units, and the maximum educational level recognized in the salary schedule.

Second, we computed weighted sample averages of the salaries paid for each combination of experience and training, using the number of teachers in each district as the weighting factor. (As it turns out, the differences between weighted and unweighted averages were very small.) The resulting salary matrix is shown in table N-1.

Third, because the AFT-represented sample districts tend to be large, urban, and northeastern, they pay higher salaries, on average, than typical districts in the United States. Therefore, to adjust for the atypically high salary level reflected in the foregoing schedule, we scaled down all the schedule entries by the ratio of the average salary in the AFT sample districts ($23,758) to the average salary in the nation as a whole ($22,019), which is to say, by the factor 0.927. Those scaled-down figures make up the synthesized U.S. salary schedule presented in Table 4.

Table N-1

AVERAGE SALARY AS A FUNCTION OF TEACHER EDUCATION AND EXPERIENCE, 78 AFT-REPRESENTED DISTRICTS, 1983-84
(Salaries in Dollars per Year)

Step	B.A. Degree	M.A. Degree	M.A. + 30 Units	Maximum
Step 1	14,848	15,946	16,779	17,661
Step 5	17,655	19,287	20,156	20,974
Step 10	21,768	23,730	24,874	26,110
Ceiling	24,515	27,955	29,136	30,364

There are essentially two reasons why the results may deviate from a valid typical schedule, one that could be constructed, in principle, by applying the same weighted-averaging procedure as described above to salary-schedule data for all school districts (or a truly representative sample of districts) in the U.S.:

Reason one is that the shapes of the salary schedules in the AFT districts may not be typical of the shapes of district salary schedules in the U.S. For example, according to the schedule shown above, the maximum level of pay in the AFT districts averages 2.04 times the base level of pay. If that ratio were lower, on average, in non-AFT districts, then our synthesized schedule would tend to exaggerate the rates at which pay typically increases with training and/or experience.

Reason two is that the distributions of teachers among the various cells in the salary schedule may not be the same in AFT and non-AFT districts. For example, since the AFT sample districts are concentrated in the north-eastern part of the country, it is likely that their enrollments are

declining faster or rising slower than enrollments elsewhere, and hence they may have fewer recently hired teachers and more teachers at the top of the seniority scale. If so, the average salary in our sample would be higher, relative to the scheduled salary levels, than in the whole universe of districts. If so, the scaling procedure would be biased. That is, if average salaries in the sample districts are higher than average salaries in the country not because of higher scheduled salaries but because teachers are more experienced or more highly trained, then scaling down the salary schedule, as we have done, is incorrect.

In sum, our method of synthesizing a U.S. salary schedule rests on the assumptions that (a) the average shape of the salary schedules in the 78 sample districts corresponds with the average shape of district salary schedules throughout the U.S., and (b) the distributions of teacher experience and training within the sample districts are similar to distributions throughout the country. To the extent that these assumptions are violated, the "typical" schedule may misrepresent the prevailing salary structure in the United States.

2. Estimation of Average Salaries of Japanese Teachers

The estimates of average teacher's salaries in Japan in 1983-84 and the four preceding years, presented in Tables 5 and 6 and used subsequently throughout the report, are derived from data reported in Ministry of Home Affairs (1985) on earnings of non-national government employees. These data include the average monthly amounts paid per employee for basic salary and each of 17 types of allowances (not all of which apply to teachers) plus the annual amounts paid for bonuses and the cold area allowance (the latter, unlike the other allowances, is expressed on an

annual basis). A complicating factor is that the "teacher" categories for which these data are provided include principals and vice-principals. Consequently, an adjustment is required to estimate the salaries of teachers exclusive of these two categories of personnel. We show the calculations in full detail for 1983-84. The calculation method for other years is the same, except as indicated below.

Upper Secondary Teachers. The average monthly amount paid for salaries and allowances of upper secondary teachers as of April 1984 is given as ¥305,951, which, multiplied by 12, equals ¥3,671,412 per year. The bonus plus cold-area allowance reported for calendar year 1983 is ¥1,479,382, which brings the annual total to ¥5,150,794. To correct for the inclusion of principals and vice-principals, we use data on basic monthly salaries, broken down by personnel categories, reported in the Survey of School Teachers, 1983 (Ministry of Education, Science and Culture, 1984). According to this source, the basic monthly payments are ¥249,857 for teachers exclusive of principals and vice-principals and ¥255,548 for "teachers" inclusive of those categories. The ratio of the former to the latter, 0.978, is used as a correction factor. Applying it to the annual salary total reported above yields the adjusted annual total, ¥5,037,477, which we use as our estimate of the 1983-84 average salary of upper secondary teachers in Table 5.

Elementary and Lower Secondary Teachers. The average monthly amount paid to elementary and lower secondary teachers for basic salary and allowances as of April 1984 is given as ¥287,133. Multiplying by 12 and adding the average 1983 annual payment for bonuses and cold area allowances of ¥1,393,021 yields a total annual earnings figure of ¥4,838,617. Again, this needs to

be scaled down to adjust for the inclusion of principals and vice principals. In this case, however, the disaggregated data on basic monthly salaries are reported separately for elementary and lower secondary personnel, and hence a weighted-averaging procedure is required to make the adjustment. According to the aforementioned Survey of Teachers, 1983, basic monthly salaries for teachers in elementary schools average ¥219,368 exclusive of principals and vice-principals and ¥233,721 inclusive of those personnel. The ratio of the former to the latter is 0.939. For lower secondary personnel, the corresponding monthly salaries are ¥227,398 and ¥237,418, and the ratio is 0.958. An average of the two ratios, weighted by numbers of teachers in elementary and lower secondary schools, respectively, is 0.946. Applying this factor to the total earnings figure given above yields the adjusted annual salary estimate of ¥4,577,332, which we use as our estimate of the average salary of elementary and lower-secondary school teachers in Table 5.

Average for All Levels. An average of the annual salary estimates given above, weighted by numbers of teachers at the elementary/lower secondary and upper secondary levels, respectively, is ¥4,695,252. We use this as our estimate of the average Japanese teachers' salary in 1983-84 in Tables 5 and 6 and elsewhere throughout the report.

Calculations for Earlier Years. The same procedure is used for the years 1979-80 through 1982-83, with one main exception: we did not have the data needed to compute adjustment factors for those years to compensate for the inclusion of principals and vice principals in the salary data, and consequently we were forced to apply the same adjustment factor as calculated for 1983-84. It is unlikely that this has more than a negligible effect on the results.

Comments Note on Potential Sources of Error. A shortcoming of this procedure, inherent in the data sources, is that the data on monthly amounts and annual amounts paid to teachers are not for exactly corresponding periods. The monthly salary and allowance payments reported in the Ministry of Home Affairs surveys are for the month of April 1984, while the annual bonus figures pertain to the 1983-84 school year. Since salary schedules generally take effect as of April 1 of each year, the monthly amounts used in these calculations may be higher than those in effect during the 1983-84 school year. If so, the annual salary estimates are biased upward.

On the other hand, the data cover a broader spectrum of teaching personnel than we have discussed in this report, including such categories as assistant teachers, lecturers, and part-time teachers, all of whom are paid less than regular teachers. The numbers of such persons are too small to introduce major errors, but their inclusion does tend to bias the salary estimates downward, thereby offsetting, to an unknown degree, the upward bias mentioned above. In our opinion, it is unlikely that the combined error due to these problems is greater than 1 or 2 percent of the salary estimates.

REFERENCES

Hill, Peter, Real Gross Product in OECD Countries and Associated Purchasing Power Parities, Organization for Economic Cooperation and Development (OECD), Department of Economics and Statistics Working Paper No. 17, December 1984.

International Labor Office (ILO), Yearbook of Labor Statistics, 1984, Geneva, 1984.

International Monetary Fund (IMF), International Financial Statistics, Washington, D.C., 1984

Japan Statistics Bureau, Management and Coordination Agency, Japan Statistical Yearbook, 1984, Tokyo, 1984.

Kravis, Irving B., "Comparative Studies of National Incomes and Prices," Journal of Economic Literature, 22:1, March 1984, 1-39.

Kravis, Irving B., Alan Heston, and Robert Summers, World Product and Income: International Comparisons of Real Gross Product, United Nations International Comparison Project, Phase III (Baltimore: Johns Hopkins University Press), 1982.

Marris, Robin, "Comparing the Incomes of Nations," Journal of Economic Literature, 22:1, March 1984, 40-57.

Mellor, Earl F., "Weekly Earnings in 1983: A Look at More than 200 Occupations," Monthly Labor Review, January 1985, 54-59.

Ministry of Education, Science and Culture, Research and Statistics Division, Education in Japan, 1982: A Graphic Presentation, Tokyo, 1982.

Ministry of Education, Science and Culture, Research and Statistics Division, 1983 Survey of School Teachers, Tokyo, 1984.

Ministry of Education, Science and Culture, Research and Statistics Division, Statistical Abstract of Education, Science and Culture, 1983 Edition, Tokyo, 1983 [English version].

Ministry of Education, Science and Culture, Research and Statistics Division, Statistical Abstract of Education, Science and Culture, 1985 Edition, Tokyo, 1985 [in Japanese].

Ministry of Home Affairs, Actual Situations of Earnings of Non-national Government Employees: Report of April 1, 1984 Survey of Non-National Government Employees' Earnings, Tokyo, March 1985 [in Japanese]. Also, excerpts from volumes of same title, 1980 through 1984.

Ministry of Labor, Policy Planning and Research Department, Yearbook of Labor Statistics, 1983, Tokyo, 1985.

National Center for Education Statistics, The Condition of Education, 1985 Edition, Washington, D.C., 1985.

National Center for Education Statistics, Digest of Education Statistics, 1983-84, Washington, D.C., December 1983.

National Education Association, Status of the American Public School Teacher, 1980-81, Washington, D.C., 1982.

National Education Association, Estimates of School Statistics, 1984-85, Washington, D.C., 1985.

National Institute for Educational Research [Japan], Basic Facts and Figures about the Educational System in Japan, Tokyo, December 1983.

OECD, National Accounts, Vol. I: Main Aggregates, Paris, 1984.

OECD, Japan (OECD Economic Surveys, 1984-85), Paris, August 1984; also, same title, 1983-84, July 1984.

OECD, The Tax/Benefit Position of Production Workers, 1979-1983, Paris, 1984.

Ward, Michael, OECD Purchasing Power Parities and Real Expenditures, OECD, Paris, 1985.