Contents

Part II Comparing Japan and Developing Countries

Part I
Reviewing Japanese Experiences

1

Economic Development and Gender Disparities: The Japanese Experience

Hiroki Nogami

Introduction

This chapter examines the relationships between gender disparities and economic development, and attempts to identify links between economic development and women's well-being in Japan's experience of industrialization.

Recent studies regarding the development of gender disparities in economic development reveal several factors relating to women's well-being. As Boserup (1990, 1995) points out, gender disparities in labour markets have been influenced by the pace of technological progress, the division of labour in factories, and social attitudes about female labour participation. According to Boserup (1990 [1987] p. 180), in many developing countries, economic and social developments are causing changes in female labour force participation and birth rates which resemble those of earlier periods in industrialized countries, but in other developing countries these changes are not occurring, either because of the negligibility of economic change or because of the strength of male resistance to changes in the traditional status of women.

Labour-intensive technical changes require the mobilization of female labour, and this factor may increase burdens on women and lead to the deterioration of women's health. On the other hand, some women cannot take advantage of new employment opportunities because of handicaps or institutional barriers to participation in the labour market. The significance of gender disparities is influenced not only by stagnant or uneven economic development, but also by the resistance of traditional society to change. These factors suggest that there seems to be no automatic linkage between economic development and the well-being of women, and this means that a development indicator which includes social as well as economic aspects of human well-being is needed.[1]

The United Nations Development Programme (UNDP) publishes an annual *Human Development Report*, in which various methods of assessing

human well-being in the developing world are proposed. The Human Development Index (HDI) is proposed to assess the achievement of a basic capability for human development. The 1995 issue of the *Human Development Report* proposes two indicators for the assessment of the realization of gender equality, the Gender Development Index (GDI), an index which reflects welfare loss caused by gender disparities, and the Gender Empowerment Measure (GEM), an index that measures women's opportunities for political and social activities.

However, the indicators proposed by the UNDP have several shortcomings. In a review of the 1991 issue of the *Human Development Report*, David Morris argues that the HDI does not allow for the creation of a meaningful time series, and this, he argues, is its most serious shortcoming (Morris, 1993, p. 868). The same argument holds for the GDI and GEM. In order to overcome these shortcomings, this chapter attempts to compute historical series of the GDI for pre-war Japan and reviews characteristics of economic development and women's well-being in the early phase of Japan's industrialization.

In the second section the literature regarding human development, gender disparities and economic development that is relevant for prewar Japan is reviewed. In the third section the statistical procedures used in the compilation of GDI for pre-war Japan are explained and their implications examined. In the final section, the main findings are summarized and issues for further study are proposed.

Survey of the literature

Assessment of the UNDP *Human Development Report*

Since the 1990s, various authors have studied the relationship between human development and economic growth. There are also a few examples of analyses of the Japanese historical experience from the human development perspective. For example, the 1995 issue of the *Human Development Report* (box 2.7: 'Addressing legal inequalities in a post-industrial society – Japan') argues that Japan's postwar constitution clearly stipulates equality under the law, and prohibits discrimination based on sex, but policy measures to overcome discriminatory practices have gained momentum only since the 1970s (UNDP, 1995, p. 44).

The 1996 issue of the *Human Development Report* (p. 53, esp. box 2.3), reviews the relevance of Japanese economic expansion for human development in developing countries today. The UNDP assessment lauds the achievement of universal primary education in the early period of prewar economic development, postwar democratic reforms, the holding down of defence expenditure and the expansion of social expenditure, industrial policies that stimulated employment, and the role of small and medium-sized firms. The Japanese experience is an example of a 'virtuous cycle', in

Table 1.1 Gender-related Development Index for Japan and other countries

1 Japan and other developed countries

	Japan	*U.K.*	*USA*	*Norway*
HDI (2001)	0.932 (9)	0.930 (13)	0.937 (7)	0.944 (1)
GDI	0.926 (13)	0.928 (11)	0.935 (5)	0.941 (1)
GEM	0.515 (44)	0.675 (17)	0.760 (10)	0.837 (2)

2 Japan and other Asian countries

	Japan	*India*	*China*	*Republic of Korea*	*Thailand*	*Indonesia*	*The Philippines*
HDI (2001)	0.932(9)	0.590(127)	0.721(104)	0.879(30)	0.768(74)	0.682(112)	0.751(85)
GDI	0.926(13)	0.574(103)	0.718(83)	0.873(30)	0.766(61)	0.677 (91)	0.748(66)
GEM	0.515(44)	–	–	0.363(63)	0.457(55)	–	0.539(35)

Notes: Figures in parentheses are the country's ranking. HDI rank is out of a total of 175 countries. GDI rank is out of a total of 144 countries, and the figures are based on data for 2000–01. GEM rank is out of a total of 70 countries. The GEM figures are based on data from the 1990s to 2003.

Source: UNDP (2003), pp. 237–40, 310–17.

which progress in human development has both been stimulated by economic growth and has contributed to it. However the UNDP argues that Japan's record is not perfect, and that challenges lie ahead (slowdown in growth, unemployment, increasing income disparities, and environmental degradation, to name a few). Furthermore, the report argues that Japan lags behind in gender equality, and that women's participation in decision-making outside the home remains low (1996, p. 53).

Table 1.1 shows the HDI, the GDI and the GEM values for Japan and other countries. GEM, which is regarded as an indicator of women's level of political participation, reveals a relatively low level of achievement, a fact that supports the description in Box 2.7 of UNDP (1995), and UNDP (1996).

Development and gender disparities in late industrialization

Traditional development economics often utilizes the concept of 'late industrialization' in analyses of economic development under globalization. The development pattern in late industrialization tends to be uneven and telescoped; in other words, the country's modern sector absorbs advanced technologies while the other sectors utilize traditional technologies. This uneven pattern of technological development widens the gap between the modern sector that enjoys the benefits of technology absorption and the other, traditional, sectors (for example, small and medium-sized firms and agriculture), which absorb a portion of the female labour force.

According to Maddison's estimates (1995), in the period from 1900 to 1910, Japanese real GDP per capita was about US$ 1,200 (see Table 1.2). These historical series are expressed in 1990 Geary–Khamis dollars (a way of estimating purchasing power parity index for international comparison).[2] This level was almost the same as the values for Asian countries such as South Korea, Taiwan and Thailand in the 1950s and 1960s. Thus it can be said that the historical experience of prewar Japan is relevant to understanding the early phase of development in developing countries at the start of the twenty-first-century.

According to Nakamura (1995, p. 177), before the Second World War, traditional industries carried the burden of the production and distribution of non-agricultural consumer goods, and handled exports, absorbing a portion of the population second only in size to agriculture. However as Tanimoto (1998, pp. 12–13 (see Notes 17 and 18 to the Introduction in Tanimoto's text) points out, the literature on Japanese female labour tends to focus on employed workers, such as workers in spinning mills, and other important aspects of female labour such as the non-agricultural economic activity of peasant families and small craft industries have not been studied sufficiently. Tanimoto (1998, pp. 12–13) also points out that female labour in agriculture, which absorbed a large proportion of the total female labour force, has not been studied systematically.

Table 1.2 Real GDP per capita (in 1990 Geary–Khamis dollars)

1 Japan and other developed countries

Year	*Japan*	*UK*	*USA*	*Norway*
1890	974	4099	3396	1617
1900	1135	4593	4096	1762
1910	1254	4715	4970	2052
1920	1631	4651	5559	2529
1930	1780	5195	6220	3377
1940	2765	6546	7018	3718

Source: The figures are from pp.297–9 and pp. 306–7 of the Japanese edition of Maddison (1995).

2 Japan and other Asian countries

Year	*Japan*	*India*	*China*	*Republic of Korea*	*Taiwan*	*Thailand*	*Indonesia*	*The Philippines*
1890	974	608	615				663	
1900	1135	625	652	850	759	812	745	1033
1910	1254	688	–		958		844	
1920	1631	629	–	1167	921		973	
1930	1780	654	786	1173	1112		1198	
1950	1873	597	614	876	922	848	874	1293
1960	3879	735	878	1302	1399	1029	1131	1488
1970	9448	878	1092	2208	2692	1596	1239	1766

Source: Maddison (1995), pp. 194–205. (Japanese translation by Hisao Kanamori [translation supervisor] and Institute of Political Economy, Toyo Keizai Shinposha, 2000). The figures are from pp. 297–9 and 306–7 of the Japanese edition of Maddison (1995).

If we can assume that the absorption and diffusion of modern technology are the most important driving forces of late industrialization, linkages between human development and economic growth depend on the extent of linkages between modern technology and improvements in the standard of living in traditional and agricultural sectors. Ohkawa and Rosovsky (1973, pp. 213–15) and Nishinarita (1985, pp. 7–8) identify the uneven and telescoped pattern of development as one of the characteristics of Japanese economic development. According to Nishinarita (1985, pp. 7–8), technological progress in prewar Japan provided benefits for employed labour in modern sectors, but self-employed workers could not enjoy the benefits of borrowed technology from abroad. Nishinarita (1985, p. 29) also points out that in the postwar period, two factors (the abolition of the traditional family system through democratic reforms, and labour-saving technological progress in the home because of the diffusion of consumer durables) promoted the labour market participation of middle-aged and elderly women.[3]

These findings suggest that improvements in various aspects of well-being cannot be connected automatically with macroeconomic growth and technological progress, and this is one reason why we require social indicators for various aspects of human development.

Relevance of the Japanese experience for development with gender equality

The UNDP (1996, p. 53) identifies the slow pace of improvement in gender equality as one of the most important issues for Japan, a finding that the historical evidence supports. For example, Table 1.3 shows the evolution of male and female wage disparities (among factory, especially spinning-mill workers) in the period between the two world wars. In order to reflect gender disparities in economic opportunities in this period, we have to

Table 1.3 Average daily cash earnings of workers by sex (in yen)

	Factory workers			*Spinning mill workers*		
	Male (*a*)	*Female* (*b*)	*Relative wage* (*b*/*a*)	*Male* (*a*)	*Female* (*b*)	*Relative wage* (*b*/*a*)
1926	2.346	0.961	0.41	1.558	0.944	0.606
1930	2.551	0.913	0.358	1.584	0.845	0.533
1935	2.433	0.726	0.298	1.33	0.635	0.477
1940	2.781	1.046	0.376	1.81	0.885	0.489
1945	5.559	2.368	0.426	4.588	1.981	0.432

Source: Statistical Bureau, Management and Coordination Agency (ed.) (1988) *Historical Statistics of Japan*, Japan Statistical Association, vol. 4, p.242.

Table 1.4 School enrolment ratios and population structure, 1873–1940

	School enrolment ratio			*Population (thousands)*		*Population share (%)*	
	Male	*Female*	*Total*	*Male*	*Female*	*Male*	*Female*
1873	39.9	15.14	34,985	17,755	17,230	50.8	49.2
1895	76.65	43.87	41,557	20,960	20,597	50.4	49.6
1900	90.35	71.73	43,847	22,051	21,796	50.3	49.7
1905	97.72	93.34	46,620	23,421	23,199	50.2	49.8
1926	99.47	99.39	60,741	30,521	30,220	50.2	49.8
1930	99.52	99.50	64,450	32,390	32,060	50.3	49.7
1935	99.59	99.59	69,254	34,734	34,520	50.2	49.8
1940	99.64	99.65	71,933	35,387	36,546	49.2	50.8

Table 1.5 Average number of years of schooling, 1890–1940

	Japan		*USA*	
	Male	*Female*	*Male*	*Female*
1890	1.9	0.6	6.7	6.3
1900	2.9	1.1	7.3	7.1
1910	4.1	2.0	7.8	7.7
1920	5.4	3.1	8.3	8.4
1930	6.8	4.4	9.0	9.1
1940	7.5	5.6	9.8	9.8

consider the wage disparities in the agriculture, transportation, and mining industries as well, but wage disparities among factory workers to some extent reflect economic gender disparities in the labour market as a whole.

Tables 1.4 to 1.7 show the achievements in education and life expectancy, respectively, of the population in prewar Japan. In these tables we can see persistent gender disparity in the achievement of well-being. For example, Hijikata (1994, pp. 9–20) examined historical statistics regarding primary school enrolment in prewar Japan from the 1890s to the 1930s. In this study she suggests that official figures tend to overestimate the rate of female school attendance, and that universal primary education for girls lagged behind that of boys. Hijikata concludes that it was only in the 1930s that universal primary education for girls was achieved in Japan (in other words, thirty years later than for boys). Utilizing a case study of Higashi-Matsuyama City (Saitama Prefecture), Hijikata (1994, pp. 14–18) argues that many girls enroled in primary school failed to graduate, and that their dropping out of school was a result of the migration of the labour force caused by industrialization. This suggests that, in order to evaluate the level

Table 1.6 Relative Japanese achievement of years of schooling to the United States

	Male	*Female*	*Gender-disparity adjusted schooling years*
1890	28.36	9.52	
1900	39.73	15.49	0.223
1910	52.56	25.97	
1920	65.06	36.90	
1930	75.56	48.35	0.590
1940	76.53	57.14	0.653

Sources: Average number of years of schooling is based on the statistics of Godo and Hayami (2002: p. 965) Table 1 which defines 'Average Schooling' as the average number of years of schooling per person in the working-age population (16–64 years old). Figures regarding Population are based on Statistical Bureau, Management and Coordination Agency (ed.) (1988). *Historical Statistics of Japan*, Japan Statistical Association, vol. 1, pp. 48–9. School enrollment ratios are based on Statistical Bureau, Management and Coordination Agency (ed.) (1988). *Historical Statistics of Japan*, Japan Statistical Association. vol. 5, pp. 212–31. Note: Japanese achievement relative to the USA is the percentage of Japanese achievement relative to US achievement. The calculation is as follows: (Years of schooling of Japanese male (or female) population/Years of schooling of US male (female) population) × 100.

Table 1.7 Life expectancy by sex and age, 1891–1947

	Life expectancy at birth		*Life expectancy at age 5*	
Year	*Male*	*Female*	*Male*	*Female*
1891–98	42.80	44.30	50.70	51.50
1899–1903	43.97	44.85	51.90	51.97
1909–13	44.25	44.73	52.57	52.16
1921–25	42.06	43.20	50.35	50.71
1926–30	44.82	46.54	51.85	53.00
1935–36	46.92	49.63	52.22	54.40
1947	50.06	53.96	53.61	57.45

Source: Figures in this table are based on the Statistics Bureau, Management and Coordination Agency (editorial supervision), 1987, *Historical Statistics of Japan*, vol. 1, Japan Statistical Association, pp. 270–1.

of educational attainment of a population properly, we should not rely solely on school enrolment ratios. Reflecting these considerations, Table 1.5 shows the average number of years of schooling estimated by Godo and Hayami (2002, p. 965). The Godo and Hayami figures refer to average number of years of schooling of the labour force – that is, the population between 16 to 64 years of age.

Table 1.7 shows the life expectancy of the male and female populations, and one interesting finding is that, in the 1920s, while GDP per capita reveals improvement, there is a deterioration in life expectancy for both the male and female populations.

GDI for pre-war Japan

Procedures for the computation of the GDI

In this chapter, GDI is utilized as a method of evaluation of the contribution of economic development to women's well-being in the Japanese historical experience. In order to overcome the shortcomings identified by Morris (1993), we attempt to compile time series of the GDI for prewar Japan. In computing the GDI, this chapter partly reflects revisions proposed by Bardhan and Klasen (1999). Most of the data are based on Statistical Bureau figures (1988).

Bardhan and Klasen criticized the procedure for the computation of the GDI proposed by the UNDP (1995) for its inclusion of non-agricultural wage disparities. According to them, this variable cannot reflect the gender disparities in overall economic opportunities in developing countries. This is because the concept of earned income excludes unremunerated work and reproductive labour, which is substantial in most parts of the developing world (Bardhan and Klasen 1999, p. 992). Furthermore, knowledge and health levels are influenced by the assets and lifestyle of the population, and wage disparities reflect gender inequality in cash income or economic flows. According to Saito (1991, p. 39), since the eighteenth century, labour-intensive innovations in Japanese agriculture induced the mobilization of the female labour force, and this factor was related to a deterioration in the health of rural women. Taking these factors into consideration, this chapter provides an alternative computation of the GDI (with and without wage disparities).

The UNDP (1995, pp. 125–35) proposes the following index of gender-related educational achievement (with the formula used by Basu and Foster 1998, pp. 1744–5. Note 16 with slight modification):

$$He = (S(F)F^{1-a} + S(M)M^{1-a})^{1/1-a} \tag{1.1}$$

In Equation (1.1), $S(F)$ and $S(M)$ refer to the female and male shares of the population, respectively, F and M refer to the respective educational achievements of the female and male populations (such as adult literacy rates), and the parameter a reflects the social preference of inequality aversion. He is a gender-disparity-adjusted education achievement index. If we assume that the value of a is 0, the value of He equals the average value of the educational achievement of the total population. If the parameter a equals a positive value, the gender disparities tend to lower the index, and this factor reflects a social welfare loss from gender disparities. We can compute gender-related health and income-generation achievement indicators, and the GDI is an average of the education, health and income-generation achievement indicators. This procedure reflects an assumption that a 1 per cent improvement in one of the three indicators can compensate for a 1 per cent deterioration in one of the other indicators.

Table 1.8 Components of GDI for pre- war Japan

		GDI (I)	*GDI (II)*	*GDI (III)*	*GDI (IV)*
Education:	Enrolment	○			
Education:	Schooling years		○	○	○
Health:	Life expectancy at birth	○	○		
Income:	Gender adjusted income index			○	
Income:	(Gender adjusted Income Index) ×(Per capita Japanese GDP relative to the United States)				○

The components of GDI are summarized in Table 1.8. We cannot compile time series of education, health and income-appropriate indicators (indicators appropriate for education, health and income) for GDI because of data constraints, so have computed GDIs using two indicators. For the computation of GDI for prewar Japan, we utilize the assumption of UNDP (1995) that the inequality aversion parameter a is 2 as a benchmark. This assumption is based on the standard procedures utilized in UNDP (1995). In this chapter, taking the criticisms and suggestions of Bardhan and Klasen (1999. pp. 996–7) into consideration, we also compute the averages of health and education achievement indicators. The indexes (GDI (I) and GDI (II) in Tables 1.8 and Table 1.9) are the values computed with education and health indicators. GDI (III) is an average of the gender-disparity-adjusted income index and the schooling index. Original figures for the schooling index are converted into ratios relative to figures for the USA. In GDI (IV), the gender-disparity-adjusted income index is multiplied by the relative position of Japanese GDP per capita to that of the USA.

As health indicators, this chapter uses life expectancy at birth, and the original figures are standardized with the formula proposed by the UNDP (1995, pp. 130–3). Health achievement values are estimated by differences between the actual value and the minimum value (22.5 years for men and 27.5 years for women). And this value is standardized by taking the ratio to a maximum value of 60 years for both men and women. We also apply the same methodology with the UNDP (1995) method for educational achievements. Indicators for educational achievements are school enrolment ratios and average schooling years estimated by Godo and Hayami (2002). For averages of schooling years, original figures are converted into values relative to those for the USA, and these were summarized in Table 1.6.

Table 1.9 GDIs for pre-war Japan

Year	*Gender-disparity adjusted school enrolment ratio* (*a*)	*Life expectancy index male/female*	*Gender-disparity adjusted life expectancy at birth index* (*b*)	*Japanese per capita GDP relative to the USA* (*c*)	*Income index* (*d*)	*Gender-disparity adjusted schooling years* (*e*)
1895	0.559	0.34/0.28	0.3067			
1900	0.800	0.36/0.29	0.3201			0.223
1930	0.995	0.37/0.32	0.3426	0.29	0.340	0.590
1935	0.996	0.41/0.37	0.3870			
1940	0.996			0.39	0.356	0.653

	GDI(I) ((a)+(b))/2	*GDI(II) ((b)+(e))/2*	*GDI(III) ((d)+(e))/2*	*GDI(IV) ((c)×,(d))+(e))/2*
1895	0.433			
1900	0.560	0.272		
1930	0.669	0.466	0.465	0.344
1935	0.691			
1940			0.5045	0.397

Notes: (a) is a gender disparities adjusted school enrollment ratio, and the adjustment is based on the formula proposed by UNDP (1995); (b) is a gender disparities adjusted life expectancy at age 0 index, and the adjustment is based on the formula proposed by UNDP (1995). The figures used for (c) are Japan relative GDP to United States. Gender disparity adjustment is based on UNDP (1995).
In the case of adjustment of life expectancy, the figures are value at age 0, and original figures are converted into indexes with an assumption that minimum life expectancy is 22.5 for men and 27.5 for women, and maximum value is assumed 60 for men and women (UNDP, 1995, p. 132) Japanese per capita GDP relative to the USA is based on estimates of Maddison (1995; p. 298 of Japanese translation) (see table 1–2 (1)); (e) is a gender disparity adjusted schooling years (relative to the value of United States) based on UNDP (1995)'s formula, and original figures are based on Godo and Hayami (2002, p. 965, Table 1). In case of GDI(I), the value of life expectancy in 1900 is the same as those for 1899–1903 and the value of 1930 are the same as those of 1926–1930 in the table 1.7 (The 16th Life Table by Ministry of Health). As for the Income Index (d), the figures are the same as those of Table 1.11, please see explanation of Table 1.11.

The most difficult issue is the computation of gender-disparity-adjusted income index. The UNDP (1995, pp. 130–3) derives the wage index using data related to non-agricultural wages and converts this factor into the income disparities index for the total population using labour participation ratios. However, since it is very difficult to derive representative wage

values for the total female labour force, we utilize the daily wages of factory labour. The male share of wage income is computed as follows:

$$\frac{\text{male daily wage}}{\text{average wage}} \times \text{male share of labour force} \tag{1.2}$$

In the case of UNDP (1995), these figures are deflated by the male population share and converted into male income share for the total population. This procedure is based on the assumption that the average female-to-male wage ratio in the non-agricultural sector is the same as the income share over the economy as a whole. The same procedures are applied to the female figures. Bardhan and Klasen (pp. 992–3) criticize this procedure because it assumes a great deal of intersectoral mobility, both male and female. They contend that this assumption of intersectoral mobility is hard to reconcile with the evidence of labour market rigidities of varying degrees across regions and sectors, and skill levels within the economy as a whole. Therefore, the procedure proposed by UNDP (1995) is not applied here, and the gender shares of gainfully employed population and labour income are used for the computations. For the variables in Equation (1.1), $S(F)$ is female labour share, $S(M)$ is male labour share, F is female labour income share, and M is male labour income share, and the income indices are computed according to Equation (1.1). This procedure implies that the income index reflects the magnitude of gender inequality in labour income for the gainfully employed population.

Using these figures, indices of gender-adjusted wage income are derived for prewar Japan. Tables 1.10 and 1.11 shows statistics for these wage indicators. This gender-disparity-adjusted income index is based on the income shares of the gainfully employed male and female populations and cannot reflect the impact of absolute improvement of income on the well-being of the population. For example, in an unequal phase of economic development, female wages may improve while the share of females in the labour force may decline. In this case, we have to evaluate the welfare significance of absolute wage improvement (in other words, economic development)

Table 1.10 Gainfully employed population 15 years and over by labour force status and sex, 1920–50

	Gainfully employed workers				
Year	*Total*	*Male*	*Female*	*Male share %*	*Female share %*
1920	25 866 195	16 349 914	9 516 281	0.63	0.37
1930	28 547 947	18 547 510	10 000 437	0.65	0.35
1940	32 661 308	20 450 340	12 210 968	0.63	0.37

Table 1.11 Average daily cash earnings of workers by sex (in yen)

	Average daily cash earnings of workers (in yen)		*Average wages of total labour force*	*Relative wage to average wage*		Wage share of labour force		income index
Year	*Male*	*Female*		*Male*	*Female*	Male	Female	
1930	2.551	0.913	1.98	1.29	0.46	0.84	0.16	0.340
1940	2.781	1.046	2.13	1.30	0.49	0.82	0.18	0.356

Notes: Gainful workers (*Yugyosha* in Japanese), a person with ordinary work or occupation was a concept utilized in population censuses in 1920, 1930 and 1940, and this concept is approximate to employed person (*Shugyosha* in Japanese). This explanation is based on the Statistics Bureau, Management and Coordination Agency (editorial supervision), 1987, *Historical Statistics of Japan*, vol. 1, Japan Statistical Association, pp. 352–3.

Source: Figures for gainfully employed population are from the Statistics Bureau, Management and Coordination Agency (editorial supervision), 1987, *Historical Statistics of Japan* vol. 1. Japan Statistical Association, pp. 366–7. Figures for wages are Statistical Bureau, Management and Coordination Agency (ed.) (1988), *Historical Statistics of Japan*, Japan Statistical Association, vol. 4, pp. 242.

and increases in gender disparity. Taking this into consideration, we compute GDP per capita in Japan relative to that in the USA (Japanese GDP per capita/US GDP per capita), and this GDP ratio is multiplied by the gender-disparity-adjusted income index. This procedure can at least consider the welfare significance of economic development and gender disparity at the same time, and GDI (IV) is the result of the computation.

Results and their implications

Table 1.9 shows preliminary GDI estimates for prewar Japan. The values are computed for the period from the beginning of the 1900s to the 1940s. The gender-adjusted health index shows the lowest achievement, and this fact reflects poor improvements in female labour, health conditions and nutrition. GDI (II) in Table 1.9, which is the average of gender-disparity-adjusted life expectancy and schooling years, reveals the lowest achievement of the various estimates of GDI.

In order to utilize the GDI for the assessment of performance of Japanese historical economic development in achieving women's well-being, it is useful to estimate the factor contribution to total GDI growth. We utilize the GDI (I) as a basis for such calculation, because it covers the longest periods, from 1895 to 1935. Table 1.12 shows the factor components of improvements in the GDI (GDI (I)) for prewar Japan. In the GDI (I) from 1895 to 1930 there were rapid increases in gender-disparity-adjusted school enrolment ratios, and this factor was responsible for the improvement in GDI (I). In general, statistics regarding education reveal rapid increases, and

Table 1.12 Levels and average annual growth rates of GDIs for pre-war Japan

1 Levels

	(1) Gender-disparity-adjusted school enrolment ratio	*(2) Gender-disparity-adjusted expectancy index*	*(3) GDI (I) = (1) + (2)/2*
1895	0.559	0.3067	0.433
1900	0.800	0.3201	0.560
1930	0.995	0.3426	0.669
1935	0.996	0.387	0.691

2 Average annual growth rates

	(4) Gender-disparity-adjusted school enrolment ratio (Growth Rate)	*Gender-disparity-adjusted life expectancy index (Growth Rate) (5)*	*GDI (I) (Growth Rate, %) (6)*
1895–1900	0.074	0.009	0.053
1900–30	0.007	0.002	0.006
1930–35	0.000	0.025	0.007

Source: (1), (2) and (3) are the results presented in Table 1.9.

this may be because school enrolment tends to be influenced by formal institutional change. Life expectancy indicators tend to reveal continuous improvement, and this may be because health indicators tend to be influenced by the long-term changes brought about by economic and social development. After 1930, continuous improvement in the life expectancy index is the main factor contributing to the improvement in GDI (I).

Summary and conclusion

Gaps between achievements in average human development and gender equalities are indicators reflecting basic social structures in rapidly and unevenly industrializing countries. This may be one of the reasons why composite well-being indicators, including GDI and GEM, are effective tools for the assessment of development patterns. Taking this into consideration, we examine improvements in women's well-being in prewar Japan. The analysis is based on GDI, a standard technique for the assessment of gender-related aspects of contemporary developing countries. Using the GDI, we attempted to identify the relevance of the prewar Japanese experi-

ence for contemporary developing counties. The pace and magnitude of achievement of gender equality in historical Japanese development can be evaluated quantitatively by the compilation of time series GDI.

The analysis shows that the achievement value in education, especially that of school enrolment, showed a relatively higher performance than other indicators. However, achievement in terms of schooling years for females tends to lag behind that for males, and this suggests a gap between the diffusion of the modern school system and the actual living conditions of the people, including social attitudes towards school enrolment of girls. These attitudes tend to reduce the successful completion of primary school attendance by girls. Improvement in life expectancy tends to lag behind other well-being indicators, and this suggests that an improvement in health conditions requires improvements in resource allocation for women in the home, and improvements in labour conditions (especially in the agricultural sector), and public health provision.

Hayami (1995, pp. 156–7, and 1997, pp. 142–3) suggest that, in the early phase of economic development, developing countries are likely to suffer from a scarcity of human capital, and this factor tends to promote labour-saving technological progress dependent on borrowed technology and specialization in standardized products. If the social benefits of investment in women's human capital are underestimated, families tend to neglect investment in girls' human capital and this factor promotes gender inequality in long-term economic development. In the Japanese case, gender gaps in education and health continued throughout the prewar period, and the postwar democratic reforms were necessary to enable women to share in the benefits of economic development. In order to overcome this unequal phase of development, the development policy authority must take care to ensure a favourable environment for investment in women's human capital. The development policy authority must also address the issue of improving labour and health conditions in rural areas, which absorb a large portion of the female population.

In this chapter we have provided a tentative GDI for the Japanese economy as a whole, but it is necessary to refine our indicators for the assessment of long-term achievements in the standard of living in Japan. In the first place, this is because there are serious regional disparities in health conditions, school enrolment and economic development. Taking this into consideration, further studies will be required for the compilation of regional GDIs for the assessment of the Japanese experience.

Second, the implications of an indicator at one stage of development can differ from its implications at another stage. For example, in an early phase of development, gains in life expectancy can be interpreted as an indicator of improvement in overall well-being. However, in advanced countries, gains in life expectancy do not provide automatic opportunities for a disability-free life. Taking this factor into consideration, indicators such as

disability-adjusted life years – DALYs (World Bank, 1993, pp. 25–7) can be utilized for the assessment of long-term gains in well-being in Japan.

Third, in order to utilize GDI for evaluation of the historical performances of the Japanese economy, it is necessary to compile time series of HDI, because GDI can be, at least theoretically, interpreted as a gender-disparity-adjusted HDI. However, as Morris (1993, pp. 868–9) argues, the HDI does not allow for the creation of a meaningful time series. This is because the HDI scales are set by the worst and best performances by a country over a year, so that the HDI is really ranking countries only relationally. There is no fixed scale against which to measure performance over time because the scale for components (especially income) changes over time. In order to overcome these shortcomings, further study will be required for historical well-being indicators.

Notes

* An earlier version of this chapter was presented as a paper at the 4th Spring Study Meeting of the Japan Society for International Development (held on 14 June, 2003). The author thanks Professor Yasuo Uchida (Kobe University), Professor Kazunori Akaishi (of Towa University at the time of the meeting, now of Takushoku University), and Professor Etsuko Kita (Center for International Health & Humanitarian Studies, The Japanese Red Cross Kyushu International College of Nursing). The author also thanks three anonymous reviewers for their kind suggestions for improvements to the chapter. Of course, any errors are solely the responsibility of the author.

1 For example, Goldin's (1995, pp. 61–3) hypothesis that across the process of economic development the adult women's labour force participation rate is U-shaped.

2 For international comparison of gross domestic product (GDP) there are several options for converting national currencies into a common unit. The Geary–Khamis approach (initiated by R. S. Geary in 1958 and developed by S. H. Khamis in 1970 and after) is an ingenious method for multilaterizing the results which provides desirable properties, and is preferred by Maddison (1995) for multilateral measure. For a further explanation of the Geary–Khamis approach, see Appendix C of Maddison (1995, pp. 162–9).

3 On the interrelationships between economic, cultural and institutional factors, Boserup (1995, p. 60) concludes that a purely economic theory of the position of women in development is as misleading as one that neglects the micro- or macroeconomic factors, and she argues for the necessity of multidisciplinary co-operation.

References

In Japanese

Hayami, Yujiro (1995) *Kaihatsu keizaigaku: Shokokumin no hinkon to tomi* (Development economics: poverty and wealth of nations) (Tokyo: Sobunsha).

Hijikata, Sonoko (1994) *Kindai nihon no gakkou to chiiki shakai: Mura no kodomo wa dou ikitaka* (School and local communities in modern Japanese history: how village children lived) (Tokyo: University of Tokyo Press).

Nishinarita, Yutaka (1985) 'Joshi rodo no shoruikei to sono henyo: 1890s–1940s' (Types of female labour and their evolution: 1890s–1940s), in Masanori Nakamura (ed.), *Gijutsu kakushin to joshi rodo* (Technological innovation and female labour) (Tokyo: United Nations University and University of Tokyo Press), pp. 7–31.
Saito, Osamu (1991) 'Nogyo hatten to joshi rodo: Nihon no rekishiteki keiken (Agricultural development and female labour: Japanese historical experiences), *Keizai kenkyu* (Economic Review), vol. 42, no. 1, January, pp. 30–9.
Statistical Bureau, Management and Co-ordination Agency (ed.) (1988) *Nihon choki tokei soran* (Historical Statistics of Japan) (Tokyo: Japan Statistical Association).
Tanimoto, Masayuki (1998) *Nihon ni okeru zairaiteki keizaihatten to orimonogyo: Shijo keisei to kazoku keizai* (Traditional economic development in Japan and the textile industry: the market economy and the household economy) (Nagoya: University of Nagoya Press).

In English

Bardhan, Kaplana and Stephan Klasen (1999) 'UNDP's Gender-Related Indices: A Critical Review', *World Development*, vol. 27, no. 6, pp. 985–1010.
Basu, K. and J. E. Foster (1998) 'On Measuring Literacy', *Economic Journal*, vol. 198, no. 451, November, pp. 1733–49.
Boserup, Ester (1987) 'Inequality between the Sexes', in John Eatwell, Murray Milgate and Peter Newman (eds), *The New Palgrave: A Dictionary of Economics* (London: Macmillan and New York: Stockton Press) reprinted in Boserup (1990), pp. 175–80.
Boserup, Ester (1990) *Economic and Demographic Relationships in Development* (Baltimore: Johns Hopkins University Press).
Boserup, Ester (1995) 'Obstacles to Advancement of Women During Development', in T. P. Shultz (ed.) *Investment in Women's Human Capital* (Chicago: University of Chicago Press), pp. 51–60.
Godo, Yoshihisa and Yujiro Hayami (2002) 'Catching Up in Education in the Economic Catch-up of Japan with the United States, 1890–1990', *Economic Development and Cultural Change*, vol. 50, no. 4, July, pp. 961–78.
Goldin, Claudia (1995) 'The U-shaped Female Labor Force Function in Economic Development and Economic History', in T. P. Shultz (ed.), *Investment in Women's Human Capital* (Chicago: University of Chicago Press), pp. 61–90.
Hayami, Yujiro (1997) *Development Economics: From the Poverty to Wealth of Nations* (Oxford: Clarendon Press).
Maddison, Angus (1995) *Monitoring the World Economy 1920–1992* (Paris: OECD) (Japanese translation by Hisao Kanamori (translation supervisor) and Institute of Political Economy, Toyo Keizai Shimposha, 2000).
Morris, Morris David (1993) 'Reviews: UNDP Human Development Report 1991', *Economic Development and Cultural Change*, vol. 41, no. 4, July, pp. 865–70.
Nakamura, Takafusa (1995) *The Postwar Japanese Economy: Its Development and Structure, 1937–1994* (Tokyo: University of Tokyo Press).
Ohkawa, Kazushi and Henry Rosovsky (1973) *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (Stanford, Calif.: Stanford University Press).
UNDP (1995) *Human Development Report 1995* (New York: Oxford University Press).
UNDP (1996) *Human Development Report 1996* (New York: Oxford University Press).
UNDP (2003) *Human Development Report 2003: Millennium Development Goals: A Compact Among Nations to End Human Poverty* (New York: Oxford University Press).
World Bank (1993) *World Development Report 1993: Investing in Health* (New York: Oxford University Press).

Index