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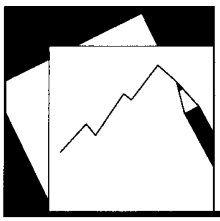

IMF Working Paper

Why Are Japanese Wages So Sluggish?

Martin Sommer

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Why Are Japanese Wages So Sluggish?

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Abstract

Over the past decade, productivity-adjusted wages have grown at a slower pace in Japan than in other rich countries. This paper suggests that Japan's dualities between regular and "nonregular" labor market contracts and the relatively inefficient services sector have exacerbated the negative impact of globalization and technical change on the labor income share felt in all advanced economies. Reforms aimed at increasing productivity in services and reducing gaps in employment protection and benefits between regular and nonregular workers could help put Japan's wages on an upward trajectory in the medium term.

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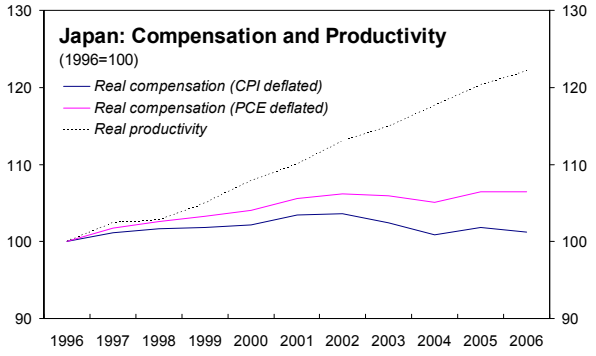
I. INTRODUCTION

1. **Real wages have stagnated in Japan over the past decade.** The real hourly wage increased by only 1 percent during 1996–2006, despite solid labor productivity growth. Contrary to what might have been expected, wage growth failed to pick up during the 2002–07 economic recovery and the gap between real hourly wages and productivity has widened to about 20 percentage points (Figure 1A).[2]

2. **These developments should be seen in the context of a longer-term decline in the labor income share in advanced economies.** The labor income share,[3] which tracks the evolution of wages relative to productivity, has been falling in many advanced countries, primarily as a result of globalization and technological change. In the past, Japan's labor income share was higher than in other advanced economies, but has recently dropped toward the G-7 average (Figure 1B).

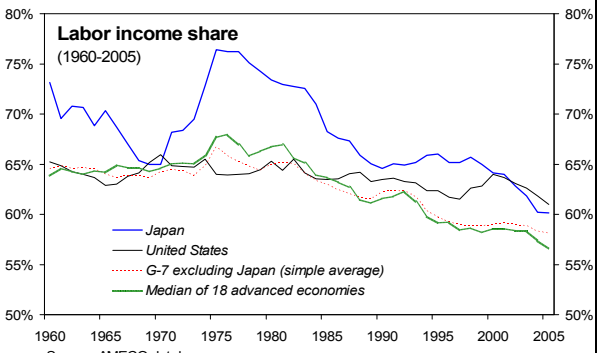
Figure 1. Advanced Economies: Compensation, Productivity, and Labor Share

A. In Japan, wages have been trailing productivity ...



Sources: Cabinet Office; and IMF staff calculations.
Note: Compensation and productivity are expressed in per-hour terms.

B. ... and the Japan's labor share has therefore declined considerably, although from high initial levels.



Source: AMECO database.
Note: Labor income share is defined as the share of employees' and self-employed persons' compensation in GDP.

3. **Already before the onset of the global slowdown, stagnating real wages became a major policy issue in Japan:**

- As in other advanced economies, there was a general concern that workers are not getting their fair share of the benefits from technological progress and globalization (see, for example, Financial Times, 2008).

[2] The accumulated gap between *nominal* hourly compensation and labor productivity is much smaller—about 10 percentage points. This is due to a divergence in price trends: the CPI index fell by -0.5 percent during 1996-2006, while the GDP deflator used for the calculation of real productivity fell by 10 percent over the same period, in part due to rapidly falling prices of capital goods.

[3] In the chapter, labor income share is defined as the share of employees' and self-employed persons' compensation in GDP (for the aggregate economy) or gross value added (for sectors). The methodology of adjustment for self-employed persons' income follows European Commission (2007).

- Moreover, overall wage stagnation has been accompanied by a widening of inequalities between high-skilled and low-skilled workers on the one hand; and (well-paid) regular and (poorly-paid) temporary workers on the other. During the current recession, the temporary workers bear the brunt of labor market adjustment, exacerbating concerns about inequality.
- Weak wage growth has held down private consumption, which in turn may have hindered the rebalancing of Japan's growth from foreign to domestic demand.

II. JAPANESE WAGES—THE MAIN FACTS

4. **Researchers have attributed Japan's sluggish wage growth to a variety of factors:**

- ***The impact of foreign competition and technology.*** The growing integration of large emerging-market economies into the global economy and advances in communication and IT technology have facilitated relocation of production and off-shoring of some production activities to low-cost areas. This process has had two effects on advanced economies including Japan:
  - International competition has pushed down relative prices of manufactured goods, reducing export revenues. In Japan, the real value added per worker in manufacturing increased by over 40 percent over the past decade. However, the nominal increase in productivity was much smaller, only about 15 percent.[4]
  - Firms operating internationally have become more sensitive to cross-country wage differentials and have limited wage growth in their home countries. Indeed, employee's compensation in Japanese manufacturing trailed nominal productivity gains by about 8 percentage points during 1996–2006.
- ***Deregulation measures.*** Liberalization measures adopted in Japan in the second half of the 1990s (especially in 1996 and 1999) expanded the list of industries that can hire "non-regular" workers.[5] These nonregular workers are much easier to dismiss, have limited social insurance, and have typically earned about 40 percent less than regular workers. The increasing share of low-wage workers, especially in services sectors, has helped to compress aggregate wage growth.
- ***Population aging.*** The Japanese working-age population has started to shrink—the share of persons between 15–64 years of age has declined from about 70 percent of total population during the 1990s to about 64 percent at present. Given the seniority-

[4] The manufacturing deflator fell by 20 percent—much faster than the GDP deflator or CPI (footnote 2).

[5] Nonregular employees include part-time workers, workers dispatched through temporary agencies, short-term hires and others (see Bank of Japan, 2005 for details).

based wage system, population aging could have reduced wages for a couple of reasons:

- The high-wage baby-boomers are being replaced by low-wage young workers (however, this report does not find any direct evidence supporting this popular view).

- Retirees are often re-hired as part-time workers at lower wage rates, as firms would like to maintain skilled labor, while the retirees seek to supplement their pension incomes.

5. **This paper studies Japan's wage developments from the international perspective, focusing on the period prior to the current global financial turmoil.** Since the impact of globalization and technological progress on wage shares in advanced economies was recently been explored in several studies (notably, Feenstra, 2007, and Jaumotte, Tytell, 2007), the following sub-sections focus on the other two factors that may have had a disproportionate effect on wage growth in Japan—the increasing incidence of non-regular employment and population aging. All the elements will be brought together in an econometric framework in Section III.

A. Deregulation: The Increasing Incidence of Nonregular Employment

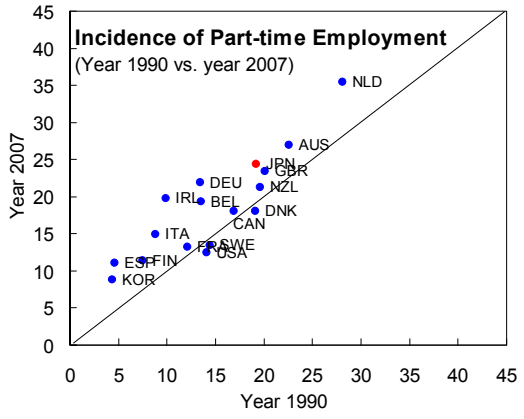
Is Japan's experience with increasing non-regular employment unique?

6. **Nonregular workers make up a significant portion of total employment in Japan.** The share of nonregular workers has grown from 20 percent of total employment in 1990 to 34 percent in 2007, creating a significant duality between employment types in the labor market. An accurate comparison of the incidence of non-regular employment across countries is not possible due to definitional differences. However, OECD data on part-time employees—typically a large fraction of nonregular employment—indicate that Japan has the third largest share of part-time employment among the sample of 19 advanced economies (Figure 2A).[6] That said, the overall *increase* in part-time employment over the past couple of decades has been larger in some European countries than in Japan.

[6] This comparison potentially makes the Japan's labor market dualities appear less pronounced because the largest increase in non-regular employment in Japan in the past couple of years was in the segment of short-term hires and workers dispatched through temporary agencies. See OECD (2002) for a detailed discussion of various pitfalls in comparing temporary employment data across OECD member countries.

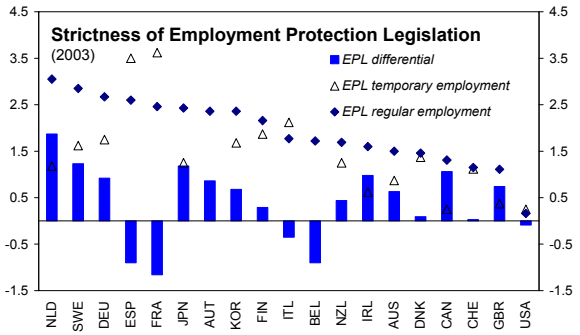
Figure 2. Advanced Economies: Labor Market Regulations and Incidence of Part-Time Employment

A. Japan has a high incidence of part-time employment compared with other advanced economies …



Source: OECD, *Population and Labor Force Statistics*.
Note: Series expressed in percent of total employment.

B. … in part due to the large difference in regulations of temporary and full-time employment.



Sources: OECD; and IMF staff calculations.
Note: EPL differential is defined as EPL for regular minus EPL for temporary employment.

7. **Hiring of temporary employees has been stimulated by the large differential between employment protection and benefits for regular and temporary workers.** The average strictness of employment protection legislation (EPL) in Japan is close to the OECD average but Japan has one of the largest differentials between the EPL indexes for regular and temporary employment in the OECD area—the protection of regular workers is fairly strict, while temporary employment is relatively lightly regulated (Figure 2B). Moreover, over the past couple of decades, most of the decline in Japan's EPL can be attributed to a less strict regulation of temporary employment, while the EPL for regular jobs has remained largely unchanged.[7] Again, labor market liberalization measures taken elsewhere, especially in Europe, has been more radical than in Japan, which potentially explains the larger increase in part-time employment in these countries.

8. **It should be noted that a high percentage of nonregular employees are comfortable with their flexible working contracts**. In particular, the labor market reforms helped disadvantaged groups such as women with children (or retirees) to enter (or remain in) the labor force. Indeed, the labor participation of women has increased from 60 percent to 66 percent of the working-age female population since the early 1990s. Switching to regular contracts is mostly sought by young cohorts (MHLW, 2003; and CAO, 2006).

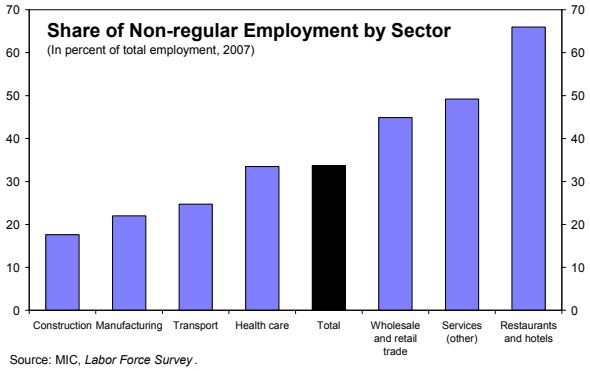
Who hires non-regular workers?

9. **Most of the increase in non-regular employment has occurred in services**, that is, in the sectors, which do not face direct international competition. In many services sectors, non-regular employees now make up 50 percent or more of total workforce. Despite concerns

about the effects of international competition, the number of non-regular, low-wage, workers has increased only modestly in manufacturing and their share has remained low at 20 percent of manufacturing employment (Figure 3A).

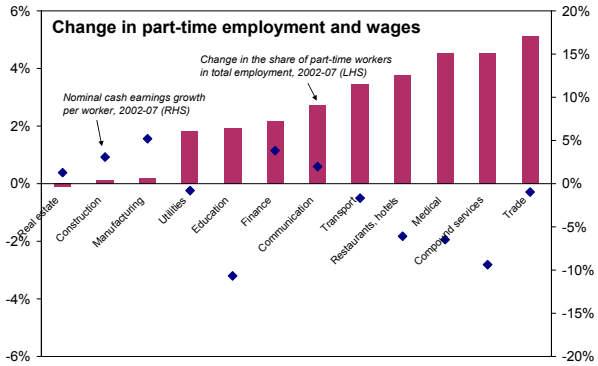
Figure 3. Japan: Sectoral Trends in Non-Regular Employment, Wages, Productivity, and Labor Income Shares

A. The incidence of non-regular employment is largest in services sectors.



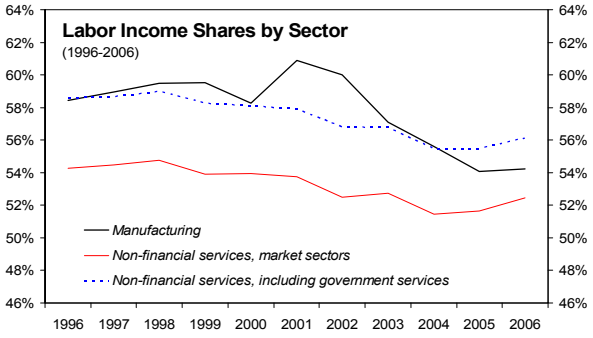
Source: MIC, *Labor Force Survey*.
Note: Non-regular employment defined as part-time employees, dispatched workers (hired through temporary agencies), workers on short-term contracts and others.

B. The significant increase in non-regular employment helped to push down average wages in services …



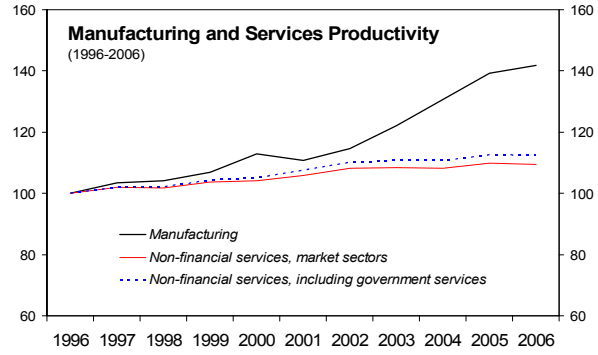
Sources: MHLW, *Monthly Labor Survey*; and IMF staff

C. … however, labor share in non-financial services has not declined much …



Sources: Cabinet Office; and IMF staff calculations.
Note: Market non-financial services are defined as utilities, trade, real estate, transport and communications, and other service activities.

D. … due to low productivity growth in the sector, in striking contrast with manufacturing.



Sources: Cabinet Office; and IMF staff calculations.
Note: Real productivity per hour.

What have been the wage outcomes?

10. **Wage growth has been significantly smaller in industries with a larger proportion of nonregular workers.** Looking at sectoral data, a greater increase in the share of non-regular employment has typically been associated with lower wage growth (Figure 3B). In many service sectors, average wages fell significantly over the past five years.

11. **Manufacturing companies granted their employees larger wage increases than other, more domestically oriented, sectors.** However, wage increases in manufacturing

[7] This pattern generally applies also to other advanced economies (OECD, 2004a).

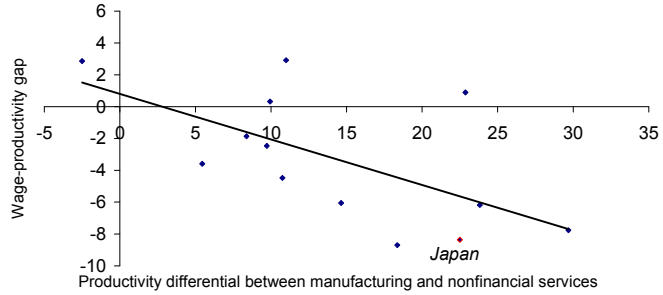
have been well below productivity gains. This would seem consistent with the hypothesis about international wage competition but, clearly, domestic factors have also been at play: manufacturers have not been pressed to offer higher wages as the domestically-oriented sectors have been offering much less attractive compensation packages.

12. **Notwithstanding the higher proportion of non-regular workers and lower average wages, the labor income share in non-financial services declined only modestly over the past decade and, surprisingly, has even increased in recent years** (Figure 3C). These developments have reflected low labor productivity growth of Japan's service sectors (Figure 3D).[8] Put differently, although services sectors have been hiring extensively at low wages, profitability of these sectors has not improved as a result of hiring non-regular employees. Instead, most of the decline in aggregate labor income share can be attributed to the manufacturing sector.

13. **Compared with other advanced economies, growth within the Japanese economy has been unbalanced.** The cross-country data suggest that Japan's non-financial services sector (accounting for about 2/3 of total employment) has achieved one of the smallest productivity gains among the sample of 15 large advanced economies over the past decade—in sharp contrast with significant productivity growth in manufacturing that places Japan above the average of its peers.

14. **The unbalanced nature of Japan's growth has likely contributed to the lackluster average wage growth.** Since wages in manufacturing could not increase as much as productivity due to globalization and technological change, and wages in the non-financial services sector have been constrained by low productivity growth, aggregate wages have trailed productivity gains. Indeed, cross-country evidence suggests that countries with sizeable differentials between manufacturing and services productivity growth have accumulated the largest gaps between wages and productivity gains in recent years, despite falling unemployment.

Advanced Economies: Wage Gaps and Productivity Differentials
(2002-06; in percent)



Sources: OECD, *Annual National Accounts*; and IMF staff calculations.
Notes: Wage-productivity gap is defined as the percent difference between real wage and productivity growth per full-time employee during 2002-06. Productivity differential equals the difference between manufacturing and nonfinancial services productivity growth over the same period.

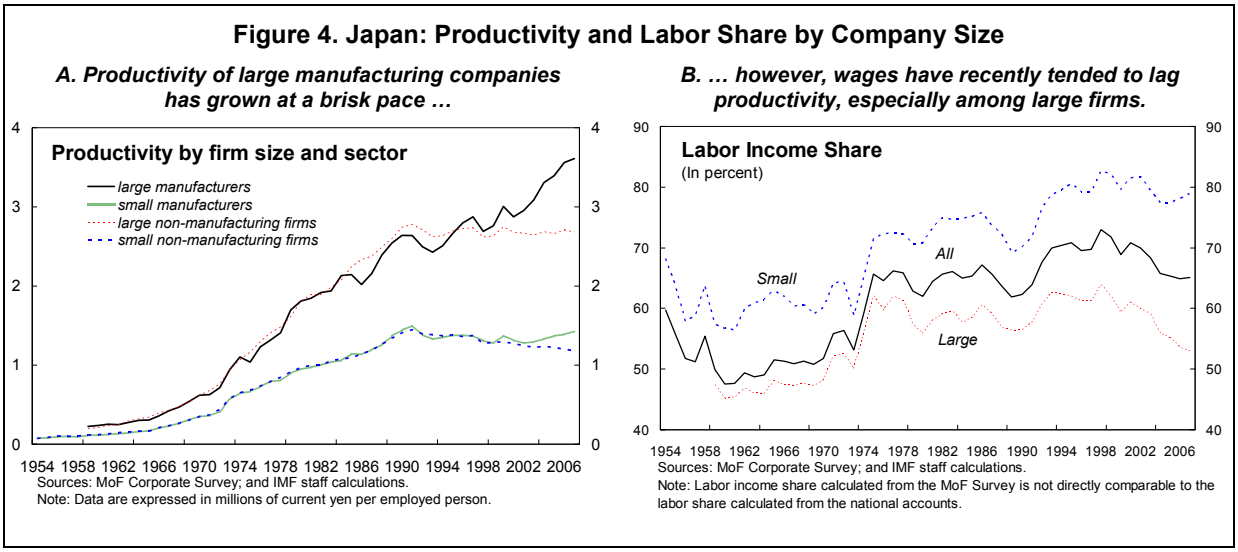
[8] The low labor productivity of Japanese services is related to the barriers to entry, limited contestability of local markets, low use of information and communication technology, and other impediments. See IMF (2007b) for details.

Dualities between large and small firms

15. **The duality in productivity performance between manufacturing and services is closely linked to dualities between small and large enterprises.** Large firms,[9] especially in manufacturing, have generally managed to increase productivity and offset rising input costs with greater success than small firms (Figure 4A). However, the small firms account for most of total employment—about 70 percent.[10] Their low productivity has been a drag on economy-wide wages because the aggregate productivity gains have been concentrated among large manufacturers—that is, precisely those firms that are likely to limit wage increases due to the globalization of labor and product markets.

16. **There are further similarities between the dualities of manufacturing vs. services and large vs. small firms.** Small firms do not seem to have become more profitable as a result of hiring non-regular employees—the labor income shares in small firms have remained roughly unchanged. Most of the decline in aggregate wage share has occurred in the segment of large corporations (Figure 4B).[11]

Figure 4. Japan: Productivity and Labor Share by Company Size



B. Population Aging

17. **In recent years, the Japanese working-age population has started to shrink.** The share of population over 65 years old has increased from 15 to about 21 percent over the past decade, the largest increase among advanced economies.

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[9] Large firms are defined as corporations with capital exceeding Y100mn.

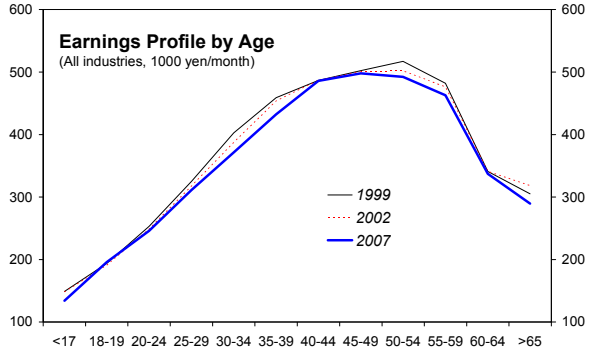
[10] Small firms also contributed most to the employment *increase* in recent years.

[11] Some caution is necessary when making productivity comparisons between large and small companies. The MoF Survey does not report hours worked and it is therefore not possible to control for the increase in part-time and other forms of non-regular employment. Moreover, the MoF Survey and national account samples are different.

18. **Re-employment of retired workers has put some downward pressure on wages.** The practice of offering part-time employment to retirees has become common as firms try to keep skilled employees while shedding labor costs. As a result, the relative wage of elderly workers has declined (Figure 5A).

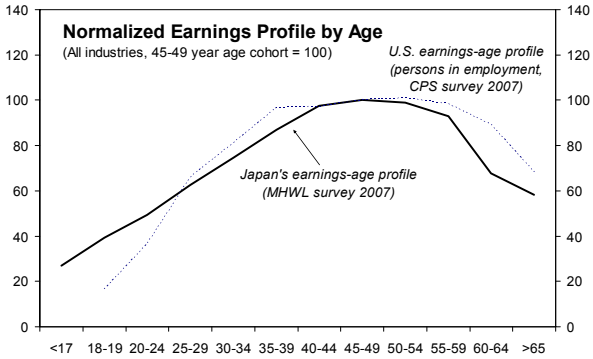
Figure 5. Japan: The Impact of Population Aging on Average Wages

A. The earnings-age profile has become flatter as the seniority-based wage system has weakened …



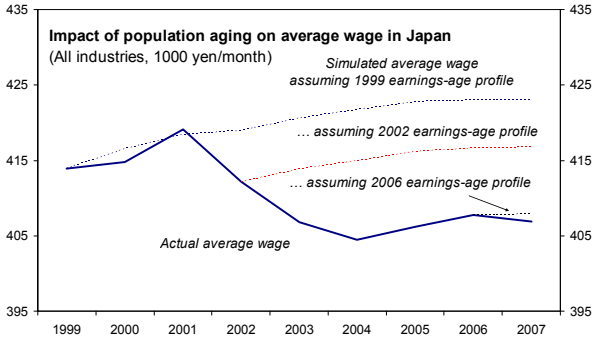
Sources: MHLW; and IMF staff calculations.
Note: Earnings are defined here as wages, overtime, and bonuses of employees.

B. … although peak earnings are still achieved later than in the U.S.



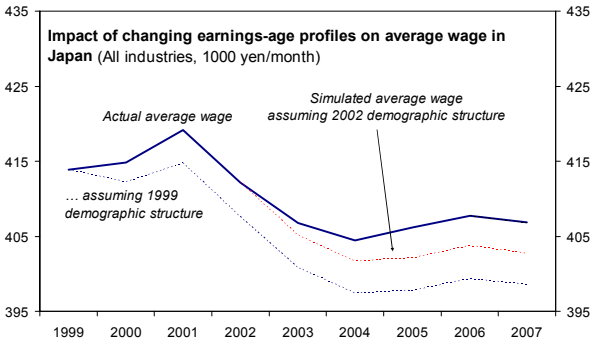
Sources: MHLW; CPS survey; and IMF staff calculations.

C. Changing demographic structure of workers has not contributed to lower average wages …



Sources: MHLW; and IMF staff calculations.
Note: The dotted paths correspond to average wages calculated holding earnings-age profiles constant at some vintage year's level, while accounting for the changing proportions of employees by age group.

D. … instead, wage sluggishness can be accounted for by changing relative wages across age groups, reflecting deregulation, globalization, and other factors.



Sources: MHLW; and IMF staff calculations.
Note: The dotted paths correspond to average wages calculated using actual earnings-age profiles but holding the proportion of employees by age group constant at some vintage year's level.

19. **More generally, the shape of the earnings-age profile has changed considerably during this decade.** The peak earnings age has shifted forward from the 50–54 year age group to the 45–49 year group. Since the earnings of workers aged 40–44 has also increased relative to the average, the wage system has effectively become less seniority-based.[12] Besides the elderly workers, another group whose earnings fell relative to the average wage is the cohort of the currently 30–34 year old employees, again mostly due to the expanding part-time employment. In this regard, changes in the earnings-age profiles highlight the equity concerns as different age groups have been influenced by globalization and deregulation differently.

[12] In the late 1990s and 2000s, a number of companies introduced elements of performance-based compensation (Bank of Japan, 2005).

20. **For comparison, the earnings-age profiles in Japan and the United States continue to display some notable differences** (Figure 5B). In the United States, peak earnings are reached earlier and the peak earnings period last even longer than in Japan. Moreover, older workers are paid a relatively higher wage in the United States than in Japan.

21. **Given the existing (albeit weaker) seniority-based wage system, the retirement of the high-wage baby-boomers and their replacement with young, low-wage, employees has also been cited as another cause of sluggish aggregate wage growth**. However, the negative composition effect from population aging *per se* has likely not contributed to sluggish wages in Japan. Calculations of aggregate wages under the assumption of unchanged earnings-age profiles but changing demographics suggests that demographic shifts may have had quite the opposite effect (Figure 5C).[13] In other words, the movement of age cohorts "along the earnings-age curve" (Figure 5A) cannot easily explain why aggregate wages have been sluggish in recent years. The intuition for this result is that while the share of employees behind their earnings peak (over 60 years) has risen, the share of low-wage young workers (under 35 years) has fallen as well—thus limiting the mechanical impact of demographics on the aggregate average wage.

22. **That said, one cannot rule out the possibility of the negative composition effect from demographics in the coming years.** Flattening of the simulated wage paths in recent years (see again Figure 5C) suggests that the demographic structure could be at the "tipping point" at which it is about to start exerting a downward pressure on average wages. However, additional calculations using the U.N. population projections for 2010 and 2015 (not reported here) also do not predict any negative composition effects from expected demographic changes.

23. **Indeed, aggregate wage sluggishness can be accounted for by the changing shape of the earnings-age profiles** (Figure 5D), which have in turn been linked to factors such as greater openness, international wage competition, and legal changes that encouraged non-regular employment.

III. Japanese Wage Developments in the International Perspective—Econometric Analysis

A. Modeling Labor Income Share

24. The previous section has illustrated how a variety of factors such as globalization or labor and product market dualities may explain stagnating wages in Japan. This section analyzes Japanese wage developments in a more general framework by estimating a model

[13] In order to assess the impact of changing demographics on aggregate wages, one can calculate the counterfactual average wage by holding the earnings-age profile unchanged at some year's level (for instance, 2002), while accounting for the actual age structure of employees. Figure 5C presents three versions of such calculation using vintage years 1999, 2002, and 2006.

that links labor income shares in a group of advanced economies to a variety of factors, including technological change, labor and product market policies, and other controls such as demographics or business cycle.

25. **The explanatory variables of the model are grouped as follows:**[14]

- ***Technological change.*** As suggested in earlier research (for example, IMF, 2007a), greater use of information and communication technology can, in the short term, reduce labor share by reducing demand for low-skilled workers. But labor share could also rebound once the skill adjustment to ICT investment is completed. This effect is captured in the model by assuming a quadratic relationship between technology and labor share.

- ***Globalization and competition.*** Increasing openness can make corporations more sensitive to international wage differentials (thus lowering labor share)—OECD, 2007; it can also make domestic markets more competitive, reducing any excess profits (with an ambiguous impact on labor share).

- ***Labor and product market institutions.*** Employment protection and product market regulation both limit competition in markets, creating "rents." Changes in labor and product market policies and institutions are therefore likely to affect the labor market share. Moreover, high unemployment replacement rates can create disincentives to work (OECD, 2004b), reducing the labor income share.

- ***Dualities in labor and product markets.***

  - ***Incidence of part-time employment.*** Nonregular workers have lower bargaining power; a higher share of part-time workers in total employment could therefore be associated with lower labor income shares. Moreover, more flexible work arrangements may facilitate entry of new workers into the labor force. Since these workers are likely of low productivity, the marginal product of labor could fall, pushing down the aggregate wage.

  - ***Differential between productivity of manufacturing and nonfinancial services.*** As discussed above, any large differences between "tradable" and "nontradable" productivities could reduce the wage share in advanced economies as the labor market gets more globalized.

[14] The model estimated in this section builds upon the econometric framework of Jaumotte and Tytell (2007) but is expanded to capture factors that reflect dualities. The data sources for variables are OECD, Ameco, EU Klems, and IMF databases, and Bassanini and Duval (2006). Other recent studies of wage developments in advanced economies include Bentolila and Saint-Paul (2003), Guscina (2006), European Commission (2007), and IMF (2007a). Earlier research includes Blanchard, Nordhaus, and Phelps (1997).

- ***Differential in ICT investment between manufacturing and non-financial services.*** This variable is included to reflect the low use of ICT in Japan's services sectors.

- ***Other controls*** include demographics, output gap and a measure of real exchange rate overvaluation.

26. **As is apparent from the discussion above, the panel regressions include—besides "deep parameters" such as openness, institutions or demographics—also several "outcome" measures**, specifically the incidence of part-time employment and productivity differentials. These outcomes should in principle be linked to their underlying determinants—for example, the productivity differential between manufacturing and services could be modeled as a function of sector-specific labor and product market regulations, market contestability and other factors. However, such a full breakdown into deep parameters is not feasible because many of the existing structural and institutional measures are of qualitative nature, change infrequently, and the relationship between the deep parameters and outcomes is likely non-linear. This gives the inclusion of outcome measures in regressions some merit—with the qualification that, in particular, any changes in the labor market share due to labor and product market dualities should be interpreted using country-specific information in a broader context of technological and regulatory change, increasing openness and so forth.

B. Regressions Using Aggregate Labor Shares

27. **Table 1 presents estimation results from a panel data model estimated over a sample of 15 advanced economies during 1980–2005.** The estimation results suggest that:

- **Technology and globalization have been important determinants of the labor income share.** Technology indeed seems to enter the model nonlinearly, reducing the wage share at low levels of technology use but later raising it once some of the low-skill occupations are eliminated. Trade openness tends to reduce the labor share with a fairly large elasticity— the labor income share falls in advanced countries by about 1 percentage point for a 10 percentage point increase in the ratio of export and imports to GDP.[15]
- **Labor and product market dualities have significant explanatory power in the regressions.** The coefficient on the share of part-time employment is large and highly statistically significant—for every 5 percentage points increase in the share of part-time employment, the labor income share falls by 1 percentage point. The differential between manufacturing and services productivity also enters with a large coefficient—in Japan's case, it contributed about 1.5 percentage point to the decline in labor share.

[15] Bank of Japan (2005) presents interesting sectoral evidence that larger import penetration tends to be associated with a greater weight of skilled labor in total labor cost.

Table 1. Labor Share in Advanced Economies: Panel Regression Estimates

Group	Variable	(1)	(2)	(3)
Technology	Share of ICT in non-residential capital stock	-0.690 (4.14)***	-0.351 (1.77)*	-0.370 (2.06)*
	Share of ICT capital squared	0.019 (4.59)***	0.012 (2.71)**	0.012 (2.96)**
Globalization	Trade openness	-0.077 (3.82)***	-0.096 (7.25)***	-0.107 (3.75)***
Dualities	Share of part-time employment	-0.206 (1.99)*	-0.238 (2.79)**	-0.228 (2.89)**
	Differential between labor productivity in manufacturing and services (in logs)	-2.866 (2.31)**	-2.235 (1.80)*	-2.082 (1.40)
	Differential between ICT capital in manufacturing and services (in logs)	-1.080 (2.07)*	-1.612 (3.59)***	-1.477 (3.06)***
Labor and product market policies	Unemployment benefits	-0.233 (7.93)***	-0.239 (7.26)***	-0.245 (7.79)***
	Product market regulation	0.503 (2.10)*	0.613 (1.47)	0.547 (1.17)
	Employment protection legislation	-1.513 (2.44)**	-1.994 (2.61)**	-2.049 (3.10)***
Cycle	Output gap	-0.152 (4.58)***	-0.123 (2.71)**	-0.118 (2.60)**
Other controls	Population 15-64 as percent of total population	…	…	0.025 (0.12)
	Deviation of REER from trend	…	…	-0.016 (0.70)
	Constant	80.19 (41.39)***	77.218 (31.25)***	76.31 (6.14)***
	Fixed effects	Yes	Yes	Yes
	Time effects	…	Yes	Yes
Summary statistics	Sample	1980-2005	1980-2005	1980-2005
	Observations	312	312	312
	Adjusted R-squared	0.88	0.90	0.90

Source: IMF staff estimates.

Notes: Robust t statistics are reported in parentheses.

{***,**,*} denote statistical significance at {1, 5, 10} percent levels.

- **As expected, high unemployment benefits and strict labor market regulations reduce the labor income share**, in line with previous research.

- **Labor share tends to decline during economic expansions but on the whole, the elasticity is small.** Demographics and a crude measure of exchange rate overvaluation do not enter significantly.

C. Regressions by Skill Level

28. **Regressions using labor share data by skill level suggest that some aspects of the increasing globalization and labor market dualities have had a different impact on the skilled and less skilled workers (Table 2):**

- Rising ***trade openness*** has had the greatest negative impact on the labor income share of medium-skilled and high-skilled workers, while the associated reduction in the labor income share of low-skilled workers is small and not statistically significant. This result is consistent with the earlier finding that the labor income share declined most in manufacturing, while in non-financial services, the labor income share has held up (Figure 3C).

- The increasing ***incidence of part-time employment*** reduced most the labor income share of low-skilled and (to a lesser extent) medium-skilled workers. Since the increase in part-time employment has been concentrated in services (Figure 3B), such finding is also intuitively appealing.

- The labor shares of all skill groups are initially reduced by the greater ***use of ICT*** (variables 1 and 2 in group "technology"), but, other things equal, the limited ***use of ICT in services*** seems to undermine the labor income share of low-income workers (variables 2 and 3 in group "dualities").

- Restrictive ***labor and product market policies*** have the largest negative impact on the labor share of medium-skilled workers—the biggest group of employees in terms of hours worked (Figure 6). The impact of labor and product market policies on high-skilled and low-skilled workers is often ambiguous or not statistically significant.

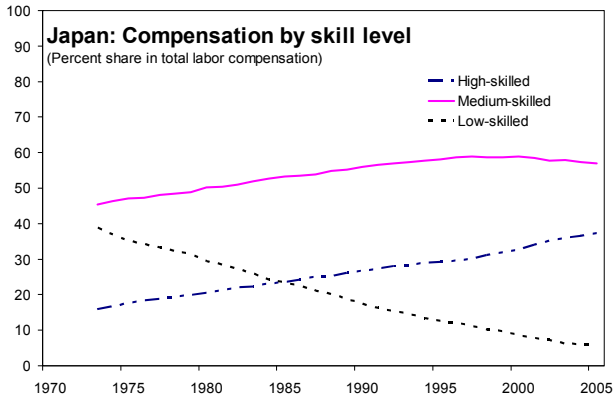
Table 2. Labor Shares by Skill Level: Panel Regression Estimates

Variable	(1)	(1a)	(2)	(2a)	(3)	(3a)
	High-skilled workers		**Medium-skilled workers**		**Low-skilled workers**	
Technology						
Share of ICT in non-residential capital	-0.14	-0.24	-0.21	-0.28	-0.37	0.12
stock	(1.81)*	(3.22)***	(1.41)	(1.78)*	(2.07)**	(0.80)
Share of ICT capital squared	0.01	0.01	0.00	0.00	0.01	0.01
	(6.08)***	(5.98)***	(0.09)	(0.66)	(2.32)**	(1.53)
Globalization						
Trade openness	-0.03	-0.02	-0.03	-0.06	-0.01	-0.02
	(4.15)***	(2.21)**	(2.22)**	(2.91)***	(0.45)	(1.33)
Dualities						
Share of part-time employment	0.13	0.12	-0.12	-0.14	-0.20	-0.21
	(2.62)***	(2.91)***	(1.43)	(1.82)*	(2.14)**	(2.57)**
Differential between labor productivity	1.95	-1.57	-1.48	-0.62	-3.04	0.42
in manufacturing and services (in logs)	(3.12)***	(2.77)***	(2.11)**	(0.61)	(5.47)***	(0.46)
Differential between ICT capital	0.24	0.10	2.44	1.23	-3.53	-2.81
in manufacturing and services (in logs)	(0.60)	(0.33)	(3.13)***	(1.49)	(4.15)***	(3.89)***
Labor and product market policies						
Unemployment benefits	0.02	-0.02	-0.34	-0.41	0.09	0.19
	(1.69)*	(1.41)	(11.17)***	(12.95)***	(2.94)***	(6.70)***
Product market regulation	-1.03	0.45	-1.13	-0.37	2.67	0.51
	(9.33)***	(3.12)***	(6.15)***	(1.13)	(10.87)***	(1.73)*
Employment protection legislation	0.31	0.28	-1.44	-1.82	-0.24	-0.35
	-1.33	(1.28)	(2.55)**	(3.11)***	(0.43)	(0.68)
Cycle						
Output gap	-0.10	-0.07	-0.08	-0.12	0.01	0.06
	(3.05)***	(2.51)**	(1.92)*	(2.39)**	(0.28)	(1.11)
Other						
Constant	9.12	15.45	44.32	47.75	25.68	13.83
	(7.65)***	(13.65)***	(23.36)***	(22.03)***	(12.35)***	(5.54)***
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	…	Yes	…	Yes	…	Yes
Summary statistics						
Sample	1980-2005	1980-2005	1980-2005	1980-2005	1980-2005	1980-2005
Observations	291	291	291	291	291	291
Adjusted R-squared	0.98	0.99	0.97	0.97	0.95	0.97

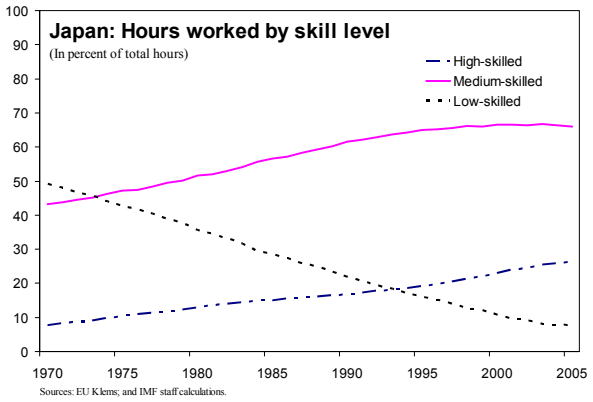
Source: IMF staff estimates.
Notes: Robust t statistics are reported in parentheses.
{***,**,*} denote statistical significance at {1, 5, 10} percent levels.

Figure 6. Labor Share and Hours Worked by Skill Level

A. The share of medium-skilled and high-skilled workers in total labor compensation has been rising in Japan as new technologies are adopted …



B. … and low-skilled positions are gradually phased out.



Sources: EU Klems; and IMF staff calculations.

D. Decomposition of Changes in the Labor Income Share

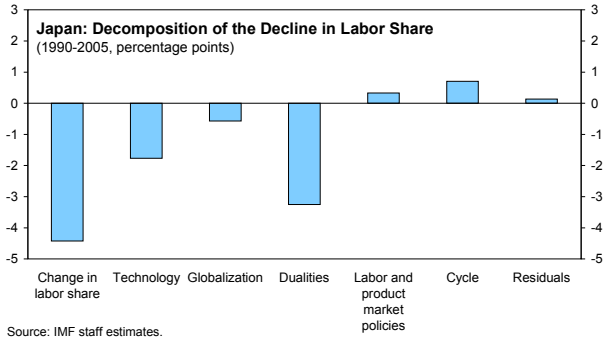
29. **The estimated coefficients in Table 1 can be used to decompose changes in the labor income share to the contribution of various explanatory variables.** In Japan, the labor share fell by 4.5 percentage points during 1990–2005.[16] This decline be split into: a –1.8 percentage point contribution of technology, a –0.6 percentage point contribution of openness, and a -3.3 percentage point contribution of dualities (Figure 7A).[17] Within the dualities group, the largest contribution is from the rising share of part-time employment (–1.4 percentage point) and productivity differential between manufacturing and services (–1.5 percentage point). The *direct* impact of changes in labor and product market regulations is estimated positive, at 0.3 percentage points, mostly because unemployment benefits relative to the median wage declined over the period. However, caution is needed in interpreting this result because liberalization measures have reduced the labor share through indirect channels, most notably by contributing to an increase in non-regular employment.

[16] Year 1990 was selected as the starting point for this calculation because the early 1990s coincide with the increasing integration of large emerging-market economies into the global economy and regulatory reforms in many countries. Moreover, labor shares were adjusting downward during the 1980s in response to the previous unsustainable rise in the period of oil shocks.

[17] A wave of corporate restructuring in Japan during the 1990s and 2000s has accelerated the reallocation of employment from manufacturing to services. While the restructuring process could on its own explain some of the wage sluggishness, its impact on the labor share (i.e., wages relative to productivity) is likely to have been *positive* as service sectors typically have higher income shares than manufacturing.

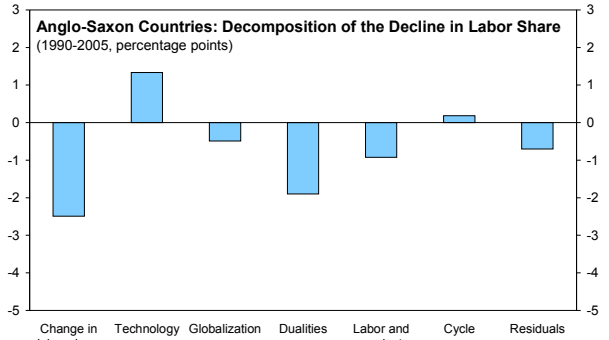
Figure 7. Advanced Economies: Decomposition of Changes in Labor Income Shares

A. In Japan, the labor income share has declined more than in Anglo-Saxon economies, with a large contribution from economic dualities …



Source: IMF staff estimates.
Notes: Technology = contribution of ICT share; globalization = contribution of openness; dualities = contribution of part-time employment, labor productivity differential, and ICT differential; labor and product market policies = contribution of labor and product market legislation and unemployment replacement rate; and cycle = contribution of the output gap.

B. … while in Anglo-Saxon economies, technology has tended to raise the labor income share as adoption of technology has proceeded at a faster pace there than in Japan.



Source: IMF staff estimates.
Note: Simple average of the United States and the United Kingdom.

30. **In some European countries, dualities have also contributed significantly to falling labor share.** For example in Germany and Italy, a rapid increase in part-time employment reduced wage shares by more than one percentage point, while the differential between manufacturing and services productivity gains contributed another ½–1 percentage point to the labor share decline.

31. **The experience of the United Kingdom and United States provides an interesting contrast.** The overall decline in labor share was only about ½ of Japan's during 1990–2005 (Figure 7B). In these two Anglo-Saxon economies, technology tended to boost the labor share as ICT investment has surpassed the threshold level: the share of ICT capital in total non-residential capital stock is higher by about 2/3 in the United Kingdom. and the United States compared with Japan. Also, dualities seem to play a relatively smaller role, reflecting a limited increase in part-time employment.[18]

IV. Summary and Policy Recommendations

32. **Wages have been trailing productivity gains in most advanced economies over the past couple of decades.** This paper confirms the importance of technological change, globalization, and labor market policies in explaining these developments. In case of Japan, the analysis highlights the role of the factors that have contributed to the build-up of labor and product market dualities—between regular and non-regular workers, large and small companies, or manufacturing and services.

[18] Of course, rising wage inequalities have raised public concerns also in these countries, notwithstanding the relatively solid growth of average wages (see, for example, IMF, 2007a).

33. **Japan's economic dualities may explain why wage growth has been more disappointing in Japan than in some other advanced economies.** The large difference in the employment protection and benefits between regular and nonregular workers stimulates the firms with low profitability (often SMEs) to offset rising input costs by offering mostly lower-paid temporary positions. As a result, profitable companies have a reduced incentive to agree on attractive compensation packages. Besides the large difference in employment protection between regular and nonregular workers, the unbalanced nature of Japanese growth together with greater openness may also have contributed as manufacturers have limited wage increases, while services sectors did not generate labor productivity growth sufficient to support higher wages. Cross-country evidence suggests that countries with large differentials between manufacturing and services productivity growth have experienced the largest declines in the aggregate wage share in recent years, despite low unemployment.

34. **Many of the factors underlying wage sluggishness in Japan are deep seated** and—after the economy recovers from the current recession—policy changes are needed to put wages firmly on an upward trajectory:

- Reforms aimed at increasing productivity in services (or, from another point of view, at small enterprises) and reducing the gap in employment protection and benefits between regular and nonregular workers could help boost per-capita incomes. However, policymakers may face here a trade-off between higher productivity and employment level, especially in regions with limited short-term growth prospects.
- The general direction of medium-term labor market reforms should be toward lower employment protection. Rather than increasing employment protection for temporary workers, flexibility should be increased for the permanent contracts (OECD, 2008). However, labor reforms which could potentially undermine domestic demand (by, for example, creating uncertainty about employment prospects and therefore increasing precautionary saving) need to be timed carefully. In any event, it is notable that economies with flexible labor markets such as the United Kingdom, the United States, and New Zealand have observed smaller declines, or even increases, in labor income shares during the previous cyclical upturn. Moreover, the more equal treatment of regular and nonregular workers would help ease equity concerns.
- Certain financial reforms would also be useful, either by facilitating emergence of new high-productivity enterprises, or by encouraging restructuring of existing inefficient businesses. Measures aimed at encouraging greater FDI could also force restructuring, while potentially helping local SMEs gain access to foreign markets, helping to boost productivity (IMF, 2007b).

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