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Japan's worsening terms of trade: its impact upon prices, income distribution and demand

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Summary

1. Japan's terms of trade are worsening due to the rise of import prices. "Trading gains" – representing the income shift to and from abroad accompanying the change of export and import prices – are falling sharply, widening the gap between real GDP (a concept based upon production volume) and gross domestic income (GDI, a concept based upon income derived from domestic production). As a percentage of GDP, the year–on–year (y–o–y) change of trading gains in the Jan–Mar quarter of 2008 has fallen to –1.7% pt. In contrast to real GDP reaching 1.3% y–o–y, real GDI stood at –0.5%, falling below the previous year. Furthermore, during the period from the Jan–Mar quarter of 2004 to the Jan–Mar quarter of 2008, real GDP grew 2.0% p.a. while real GDI only grew 0.9% p.a. While real GDP increased by JPY42.5 trillion during this time period, trading gains fell JPY22.9 trillion, meaning that more than half the income from production activity had been shifted overseas.

2. Japan's worsening terms of trade are also serving as the background to the widening gap between industrial production and corporate business confidence. Growth on a volume–basis (real GDP, production) is not leading to gains (real income, corporate profits) because of the deterioration of terms of business.

3. A comparison of the current conditions with the two oil crises in the past reveals that while the deterioration of the terms of trade during the 1st Oil Crisis led to home grown inflation, the 2nd Oil Crisis did not entail a rise of the GDP deflator. At the current juncture, the GDP deflator is declining, essentially resembling a home grown deflation. This stems largely from the limited pass–through of costs to prices. Up to FY2007, the pass–through ratio is estimated to be approximately 15%.

4. Given the limited pass–through of prices, the deterioration of terms of trade is absorbed either by the decline of unit labor

costs or fall of unit profit (nominal profit per unit of production). Since 2004, unit labor costs have been falling at a slower pace and driving up the terms of trade, thus amplifying the deterioration of unit profit.

5. Nominal value added failed to grow during the expansion cycle from the beginning of 2002. Under such conditions, corporate income drains continued due to worsening terms of trade in contrast to the rise of household income reflecting the upturn of labor market conditions. In other words, the deterioration of Japan's terms of trade worked to the disadvantage of corporations through the distribution of income between the corporate and household sectors, resulting in the fall of profits and business confidence among corporate enterprises.

6. Ordinarily, corporate enterprises would be able to determine the rate of wage growth through the relationship with labor productivity. However, in times of massive income drains as recently observed in Japan, such income drains must be taken into consideration when determining wage levels. Since the income drain must be shouldered by either the corporate or household sector, the burden upon the corporate sector would rise if wages commensurate with labor productivity gains are paid. From the foregoing perspective, the rise of the labor distribution rate in 2006 may be interpreted as the result of the actual rate of real wage growth rising above the previous–year level in contrast to the neutral rate of real wage growth (the rate of real wage growth which maintains the labor distribution rate at the same level as the previous year) falling below the previous year due to slowdown of labor productivity along with the rise of income drains.

7. Turning to the impact of the weak pass–through of costs to prices upon demand, even though domestic demand will fall due to the direct decline of domestic income, Japan may look forward to the rise of its exports due to the avoidance of higher export prices. In fact, of Japan's real GDP growth in the Jan–Mar quarter of 2008 (1.3% y–o–y), the contribution by external demand was 1.4% pt

while the contribution by domestic demand stood at –0.1% pt, revealing a clear contrast between the strength of external demand and the weakness of domestic demand. Furthermore, as for the contribution by domestic demand, the contribution by personal consumption was 0.8% pt and the contribution by capital investment was –0.1% pt. Considering that this is due largely to income drains from corporations, this will tend to have a negative impact upon capital investment for the time being.

8. Even though businesses have been refraining from wage hikes toward the household sector and have shouldered most of the additional costs stemming from higher raw material prices without passing them through, the pass–through of costs to prices appears to be picking up recently. In addition to the rise of inflation expectations, the severity of the corporate profit environment is prompting corporate enterprises to pass through costs to prices at a faster pace, leading to the possibility of real income declines in the household sector. Thus far, personal consumption has held up well because the rise of consumption propensity had compensated for the weak rise of household income. However, since the level of consumption propensity is already high, there are concerns that the fall of real income may trigger a fall of personal consumption.

9. An upturn of domestic demand may be expected in times of a recovery of terms of trade following its downturn. That said, since a "virtuous cycle of domestic demand and domestic income" may not be expected anytime soon, Japan's economic recovery will continue to be driven by external demand. In terms of overseas transactions, note a sharp "contrast"; namely the expansion of real net exports in contrast to the deterioration of trading gains. Looking forward, in the subsequent recovery of terms of trade, there is the possibility that the opposite phenomenon may occur. In other words, real net exports may worsen in contrast to the improvement of trading gains. In such case, the economy may remain in the doldrums for a considerable period.

10. On a global scale, even if there is a shift of income from countries

without natural resources ("commodity–importing countries") to countries possessing natural resources ("commodity–exporting countries"), gross global income would remain unchanged. On a country–to–country basis, the impact of overseas transactions upon the amount of income in each country would also be limited. However, the recent surge of crude oil prices is outpacing the rise of domestic demand in commodity–exporting countries. Even though the reflux of money from commodity–exporting countries to commodity–importing countries would be expected under these circumstances, in reality, it is actually creating a "liquidity glut", serving as investment funds leading to a further rise of crude oil prices and magnifying market volatility. Given the close interrelation among the liquidity glut, global economic expansion and the rise of primary commodity prices, the question of how to guide money flows and the real economy onto a soft landing amid definite signals of a global economic slowdown, will serve as the key to the future course of the global economy.

1. Introduction

Prices of imports are surging due to the rise of prices of primary commodities such as crude oil. In contrast, export prices are only rising at a mild pace because of fierce global competition. As a result, Japan is facing a significant worsening of its terms of trade (**Chart 1**).

The deterioration of Japan's terms of trade most likely has a strong impact upon the fact that the Japanese economy is nearing a turning point after a prolonged period of expansion. In this paper, we shall ascertain how the income drains stemming from worsening terms of trade are reflected in Japan's GDP statistics. We shall then identify the effect of the deterioration of terms of trade upon prices

and income by comparing the current conditions with the past oil crises. Based upon the foregoing, we shall examine its impact upon demand and provide an outlook on the future course of the Japanese economy.

Chart 1: Terms of trade
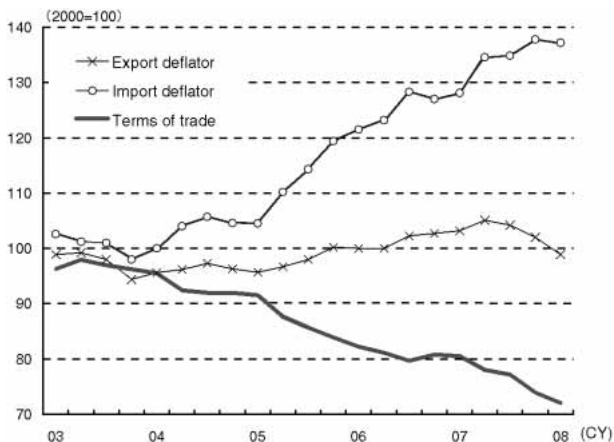
Source: Cabinet Office, *Kokumin shotoku tokei* (*National Income Statistics*).

2. Real income

(1) The gap between real GDP and real income

In the section below, we shall first examine how the transfer of income from Japan to countries abroad along with the deterioration of terms of trade stemming from the rise of import prices are reflected in Japan's GDP statistics.

The transfer of real income accompanying price fluctuations of overseas transactions is reported as "trading gains" in GDP statistics. Since real GDP is a quantity–based concept, overseas transactions

are also reflected as the change in quantity terms. Real GDI (gross domestic income) is derived by adding income transfers (outflow/inflow) accompanying price fluctuations in overseas transactions to real GDP (**Chart 2**). Real GDI may be deemed as an indicator gauging residents' purchasing power of gross real income gained from domestic product. Real GNI (real gross national income) is derived by adding "net income from abroad" to real GDI.

Chart 2: Definitions of real GDI, real GNI, trading gains

Real GDI (real gross domestic income)
        ＝real GDP + trading gains

Real GNI (real national gross income)
        ＝Real GDI + net income from abroad (real)

Trading gains
        ＝(Nominal net exports ÷ numeraire deflator) − real net exports

Numeraire deflator
   ＝(Nominal exports + nominal imports) ÷ (real exports + real imports)

If the rise of prices is limited to self–sufficient goods, the transfer of income would take place only between domestic sectors, leaving the total amount of domestic income unchanged. Note that domestic income would only be affected by price fluctuations of overseas transactions – in other words, changes in terms of trade.

Since terms of trade do not change much under normal circumstances, large gaps between real GDP and real GDI would not occur. However, trading gains are declining due to a sharp deterioration of Japan's terms of trade in recent times, widening the gap between real GDP and real GDI.

As of the Jan–Mar quarter of 2008, the year–on–year (y–o–y) change of trading gains as a percentage of GDP fell to –1.7% pt. As a result, in contrast to real GDP reaching 1.3% y–o–y in the Jan–Mar quarter, real GDI (–0.5% y–o–y) and real GNI (–0.2% y–o–y) both fell

from the previous year on a real income basis (**Chart 3**). Moreover, in the event the year 2004 is the starting point when it became increasingly evident that Japan's terms of trade were worsening, real GDP rose 2.0% p.a. in contrast to real GDI increasing only 0.9% p.a. during the period up to the Jan–Mar quarter of 2008. This is due to the fact that trading gains fell JPY22.9 trillion despite the growth of Japan's real GDP by JPY42.5 trillion during this period, leading to the overseas exodus of half of the income gains generated by production activity (**Chart 4**).

Chart 3: Real GDP, GDI (y–o–y change)
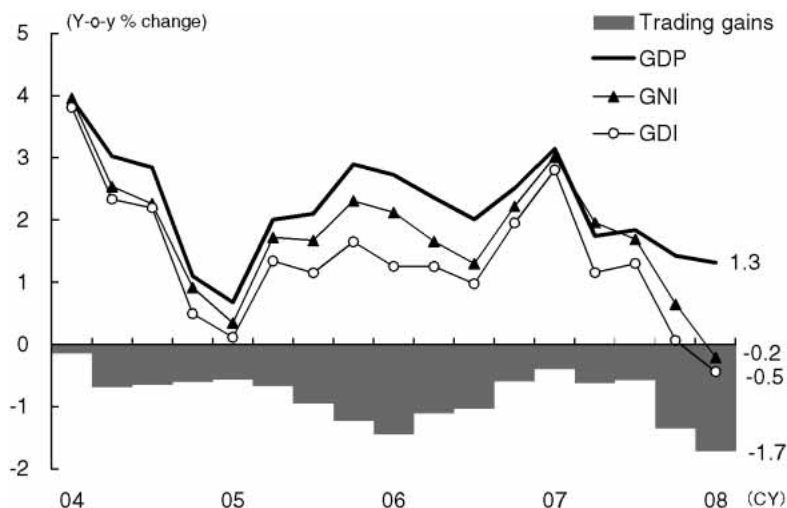
Source: Cabinet Office, *National Income Statistics.*

Chart 4: Real GDP, real GNI

(Trillion yen)

Real GDP: 42.5
Real GDI: 19.7
Trading gains -22.9 trillion yen
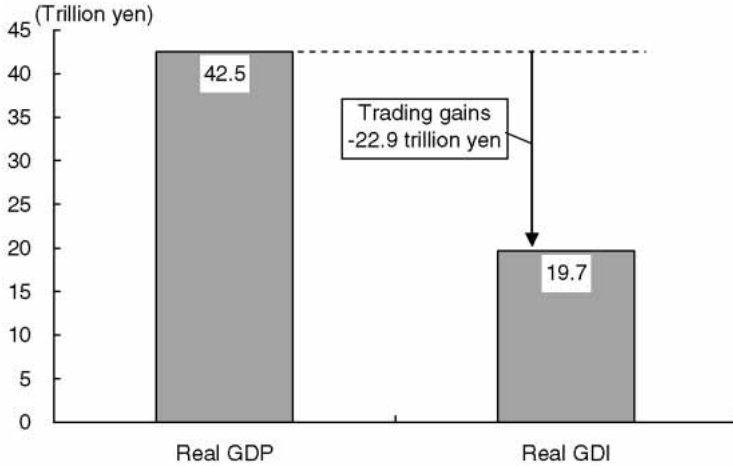
Source: Cabinet Office, *National Income Statistics*.

(2) The deviation of industrial production and business confidence

The deterioration of terms of trade is leading to the recent gap between industrial production and business confidence among manufacturers (**Chart 5**). As for real GDP and industrial production both of which are quantity–based concepts, real GDP is following an upward curve and industrial production is more or less flattening out or moderating. However, since terms of transactions are turning disadvantageous due to worsening terms of trade, growth on a quantity–basis is not necessarily leading to the rise of profits. As a result, real income is declining and business confidence is worsening due to the fall of corporate earnings.

Chart 5: Industrial production and business confidence (manufacturing)
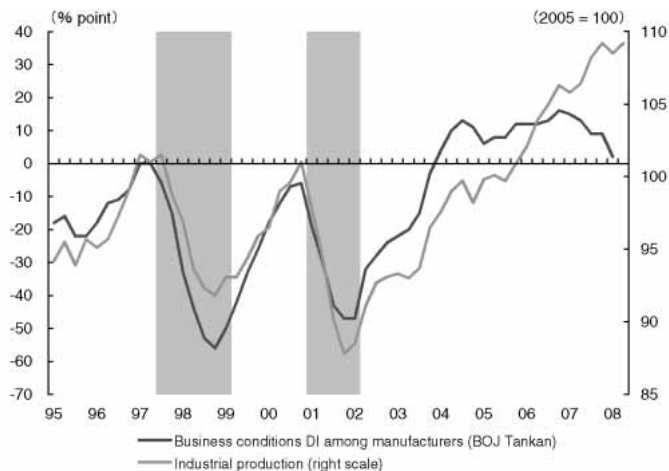
Note: Industrial production for the Apr-Jun quarter of 2008 are based upon forecast indices.
Source: Bank of Japan, *Short-Term Economic Survey of Enterprises in Japan (Tankan)*,
　　　　Ministry of Economy, Trade and Industry, *Indices of Industrial Production*.

3. The pass–though of costs to prices and its impact upon prices and income distribution

Since the rise of import prices such as raw materials must be borne either by the corporate or household sector, the share of burdens between the corporate and household sectors and its impact upon domestic prices would differ depending upon the pass–through of prices by corporate enterprises. As set forth in **Chart 6**, if the pass–through of costs to prices by corporate enterprises is zero, corporate enterprises would bear the entire burden, pushing up the labor distribution rate. Since domestic prices would not rise in this case, household real income would remain unchanged. On the other

hand, in the case of a 100% pass–through of prices, the burdens of the corporate and household sectors would be even and the labor distribution rate would remain unchanged. However, note that real incomes of both the corporate and household sectors would decline due to the rise of domestic prices (note 1).

Chart 6: The pass–through of costs to prices and its impact upon the corporate and household sectors

| | Initial | 10% rise of raw material prices | |
| | | Pass-through ratio by corporate enterprises | |
		0%	100%
Sales	200	200	210
Intermediate input (raw materials)	100	110	110
Value added	100	90	100
Household income	60	60	60
Corporate earnings	40	30	40
Prices (final goods)	100	100	105
Labor distribution rate	60%	67%	60%
Value added (real)	100	90	95
Household income (real)	60	60	57
Corporate earnings (real)	40	30	38
Notes		Decline of nominal and real corporate income. Nominal and real household income remain unchanged. The labor distribution rate rises as a result thereof. Even though prices do not rise, overall real income falls sharply.	Both corporate and household nominal income remain unchanged and the labor distribution rate also remains unchanged. Real incomes decline in both the corporate and household sectors due to the rise of prices. The fall of overall real income is smaller than in the case where the pass-through ratio is zero.

Source: Mizuho Research Institute Ltd. (MHRI).

(1) The impact upon prices

The current downturn of terms of trade is characterized by the fact that Japan's worsening terms of trade is leading to homegrown deflation. In other words, the rise of the import deflator is pushing down the GDP deflator which is a price indicator based upon domestic factors.

The deterioration of terms of trade leads either to the rise of the domestic demand deflator or the decline of the GDP deflator, depending upon the pass–through of costs to prices (note 2). Assuming a 100% pass–through of costs to prices, the domestic demand deflator would rise but the GDP deflator would remain unchanged. On the other hand, in the absence of the pass–through of costs, the domestic demand deflator would remain unchanged while the GDP deflator would decline due to the rise of the import deflator which is a deduction item.

Under the current downturn of Japan's terms of trade, the breadth of the GDP deflator in negative territory is widening while the rise of the domestic demand deflator remains subdued. Given the slow pass–through of costs to prices among corporate enterprises, the deterioration of terms of trade is covered mostly by the decline of the GDP deflator, resembling a homegrown deflation (**Chart 7**).

**Chart 7: The deterioration of terms of trade and its impact upon deflators**
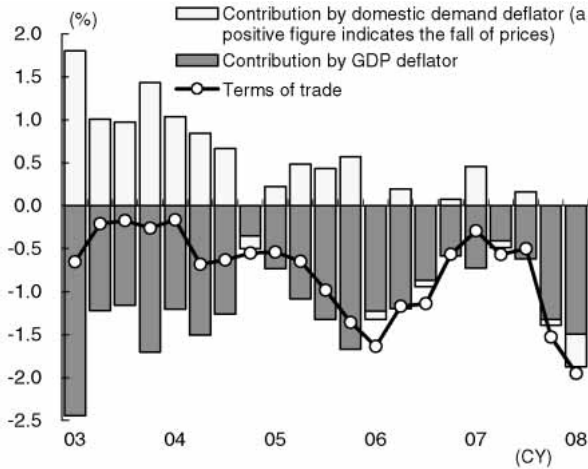
Note: Percentage rise of GDP deflator = Wd × percentage rise of domestic demand deflator
+ We × percentage rise of import deflator − Wm × percentage rise of import deflator
In the equation above, the second line is defined as the terms of trade.
Wi refers to the domestic demand, exports and imports as percentages of nominal GDP.
Source: Cabinet Office, *National Income Statistics*.

Turning to the actual pass–through of costs to prices, the import deflator rose a dramatic 37.2% from the first quarter of 2004 to the first quarter of 2008. If the rise of import prices had been passed through entirely to end prices, the domestic demand deflator would have risen by 3.0% during this period. In practice, however, the domestic demand deflator fell by 0.3%.

The foregoing leads to our estimate that the pass–through of costs to prices from the first quarter of 2004 to the end of FY2007 was an extremely low 15% (note 3) (**Chart 8**).

Chart 8: The pass–through ratio and the domestic demand deflator
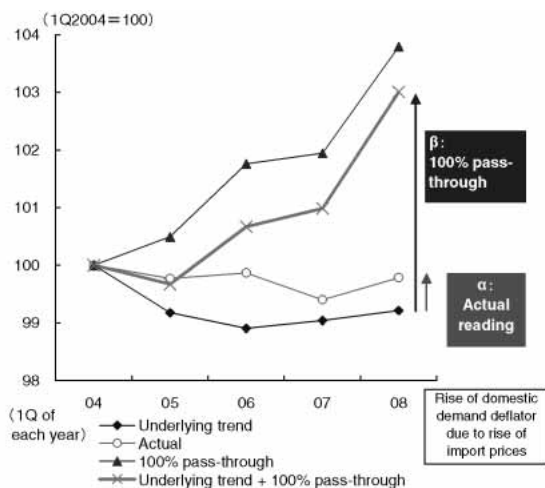
Note: 1Q2004 = 100.
The domestic demand deflator at 100% pass-through is defined in the following equation where the percentage rise of the GDP deflator is zero.
$$m \times Pm + P = X \times Px + d \times Pd$$
Where P is the percentage rise of the GDP deflator,
PM is the percentage rise of the import deflator,
Px is the percentage rise of the export deflator,
Pd is the percentage rise of the domestic demand deflator,
m is the import rate (real imports/real GDP),
x is the export rate (real exports/real GDP),
d is the domestic demand rate (real domestic demand/real GDP).
The underlying trend of the domestic demand deflator is calculated by the underlying trend of the GDP deflator derived in Chart 9 using the foregoing equation, where the import deflator is zero.
The pass-through rate shall be $\alpha \div \beta$
Source: Cabinet Office, *National Income Statistics*.

Furthermore, while the GDP deflator stood at –1.5% y–o–y in the Jan–Mar quarter of 2008, the GDP deflator would have risen by approximately 0.2% y–o–y on the back of the improvement of the GDP gap, if Japan's terms of trade had not worsened (**Chart 9**).

Chart 9: Japan's GDP deflator in the absence of the deterioration of terms of trade
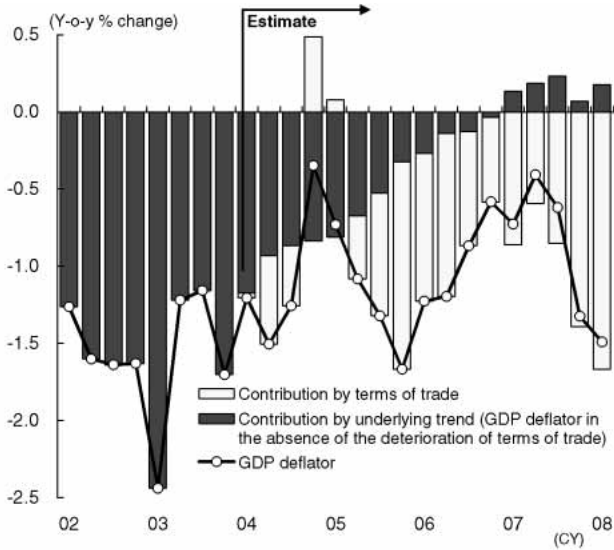

Note: The underlying trend is derived by the relation between the GDP gap and the GDP deflator up to 2003 and by extrapolating the GDP gap for the period from 2004 onward.

Source: Cabinet Office, *National Income Statistics*.

At the time of the 1st Oil Crisis, corporate enterprises raised the price of end products to cover the rise of costs and wages were raised to cope with the fall of household real income due to the rise of prices. Furthermore, a "wage–price spiral" was created as a result of movements among corporate enterprises to raise the price of end products to cover the fall of earnings due to higher wages. Thus, the surge of both the domestic demand deflator and the GDP deflator led to the rise of homegrown inflation (**Chart 10**).

Turning to the 2nd Oil Crisis, corporate enterprises took time to pass on the costs to prices and wages were not raised to cope with the fall of real household income. The rise of the domestic demand deflator remained subdued at a single–digit level and the GDP deflator climbed back to levels prior to the oil crisis, albeit a slight slowdown immediately after the oil crisis (**Chart 10**).

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Chart 11 sets out the movements of deflators at the current juncture and during the past oil crises. The impact of the deterioration of terms of trade upon the GDP deflator reveals contrasting results: a sharp rise during the 1st Oil Crisis, no change during the 2nd Oil Crisis and a downturn during the current deterioration of terms of trade.

Chart 10: The impact upon deflators during the 1st and 2nd Oil Crises
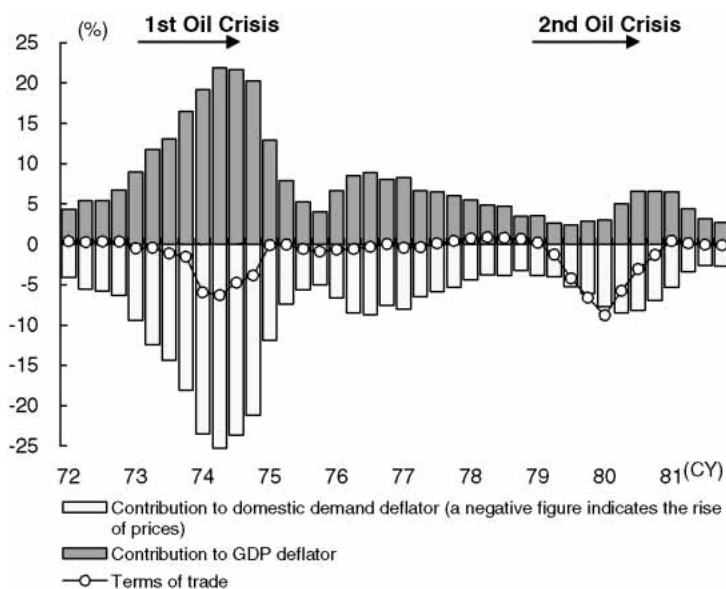
Note: The same method of factor decomposition used as in Chart 6.
Source: Cabinet Office, *National Income Statistics*.

Chart 11: Comparison of deflators in the current phase and the past oil crises

			The 1st Oil Crisis	The 2nd Oil Crisis	Current deterioration of terms of trade
			4Q1972 - 1Q1975	4Q1978 - 1Q1981	1Q2004 - 1Q2008
Percentage rise of import deflator (p.a.)			42.8	34.2	8.2
Percentage rise of domestic demand deflator (p.a.)			19.6	6.5	-0.1
Percentage rise of GDP deflator (p.a.)	Actual	a	18.3	4.7	-1.1
	Underlying trend	b	5.6	4.7	-0.2
Percentage rise of GDP deflator Actual minus underlying trend (% pt)		a-b	12.7	0.0	-0.9

Note: The underlying trend of the GDP deflator during the past oil crises refers to the percentage rise of the year when the crisis occurred (1972 with respect to the 1st Oil Crisis and 1978 with respect to the 2nd Oil Crisis). The underlying trend derived in Chart 9 with respect to the current downturn of terms of trade.
Source: Cabinet Office, *National Income Statistics*.

(2) The impact upon income redistribution

### a. Income redistribution per unit of output

One characteristic of the current downturn of terms of trade is the decline of the GDP deflator. In the following section, we shall examine how the deterioration of terms of trade affects the distribution of income in the corporate and household sectors, through a factor decomposition of the GDP deflator.

The GDP deflator may be decomposed in terms of income into unit labor cost and profit (profit per unit or output). Note that unit profit continued to rise above the previous year during the period from 2002 to 2005 but took a downturn in 2006 (**Chart 12**). Meanwhile, while unit labor costs have been following an uninterrupted fall since 2001, the breadth of the fall has been declining since 2005, alleviating the negative pressures upon the GDP deflator.

We shall next examine which of the factors absorbed the deterioration of the terms of trade by a factor decomposition of the GDP deflator in terms of income and expenditures. Even though

Japan's terms of trade worsened (–0.6% pt) during the period from 2004 to 2006, unit labor costs improved (1.4% pt) during this period reflecting factors such as the improvement of labor market conditions, the breadth of the fall of unit profit widened (–1.7% pt) (**Chart 13**).

Chart 12: Factor decomposition of the GDP deflator (from the income–side)
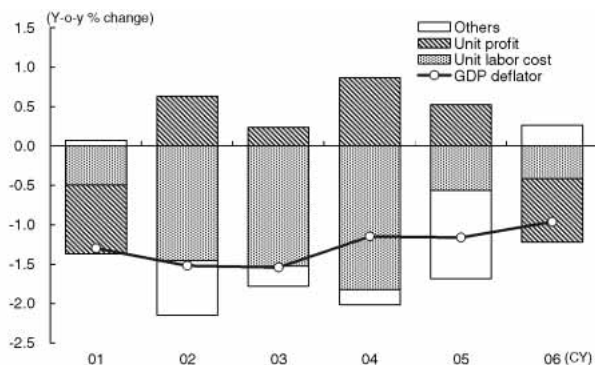
Note: Unit profit = net operating surplus ÷ real GDP.
Others = net mixed income + consumption of fixed capital + indirect taxes and subsidies.
Source: Cabinet Office, *National Income Statistics*.

**Chart 13: Factor decomposition of the deterioration of terms of trade**
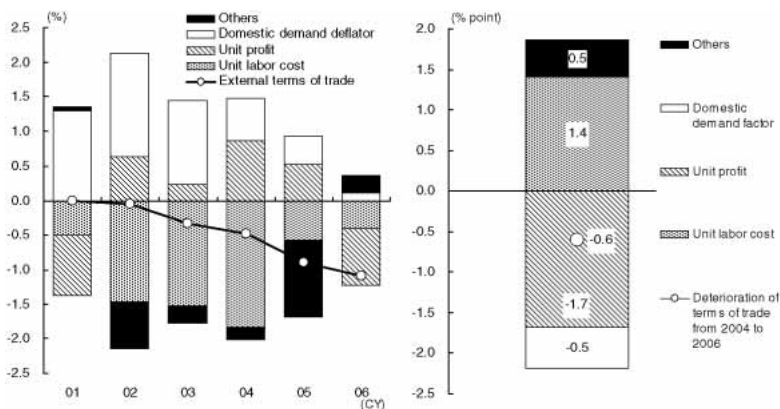
Source: Cabinet Office, *National Income Statistics*.

b. Redistribution of nominal value added

We shall look next at the redistribution of income of domestic corporations and households from the trends in overall national income.

Turning first to nominal GDP, the rate of Japan's nominal GDP growth averaged 1.3% per year during the past three years, ranking at the bottom of the seven major industrialized countries of the world (**Chart 14**). Note that nominal GDP growth among the G7 countries averaged at 4.7%. Even in comparison with 2.9% in Germany which ranked second lowest, the rate of Japan's nominal GDP was more than 1% pt lower, indicating that the expansion of Japan's income itself was limited.

Chart 14: G–7 nominal GDP growth

(average growth during 2004 to 2007)
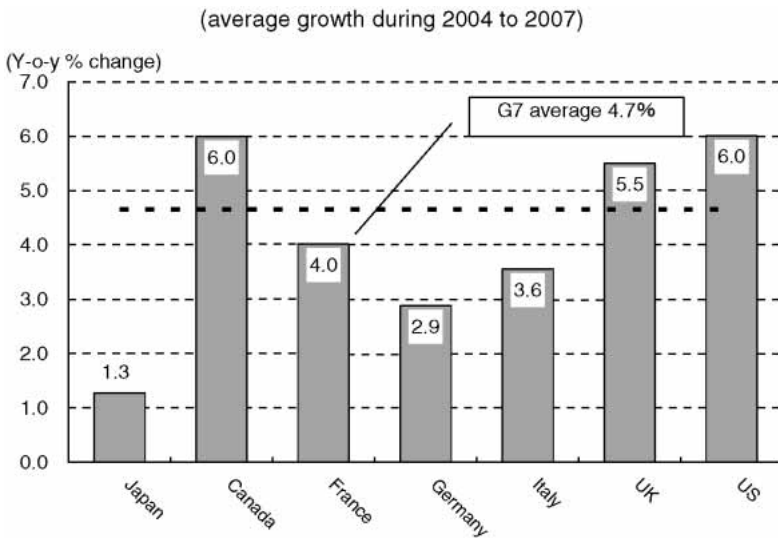
Source: International Monetary Fund.

Furthermore, even though Japan's current expansion cycle is said to be driven mainly by large corporate enterprises, the expansion of value added (defined as the total of ordinary profits, labor costs,

depreciation and interest costs) is yet to be achieved even among large corporate enterprises. **Chart 15** sets forth the component ratio of value added in terms of corporate size. Note that in recent years, the component ratio of large corporate enterprises is held constant at the lower half of the 39% level.

Chart 15: Component ratio of value added (by corporate size)
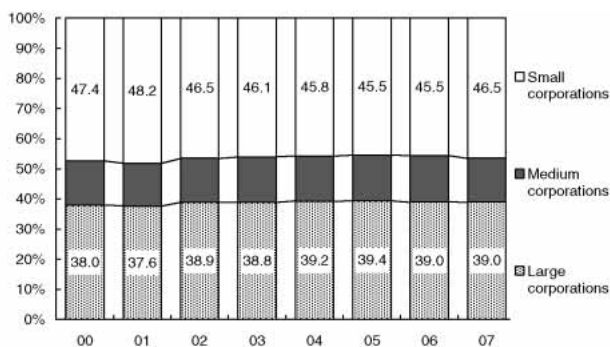
Note: Value added = ordinary profits + labor costs + depreciation + interest cost etc.
 "Large corporations" = capital of 1 billion yen or over,
 "small corporations" = capital of 10 to 100 million yen.
Source: Ministry of Finance, *Financial Statements Statistics of Corporations by Industry, Quarterly.*

Under the foregoing conditions, the rise of profits among large corporate enterprises stems largely from the reduction of labor costs. The past trends in components of value added reveals that the component ratio of ordinary profits has been expanding in contrast to the contraction of the component ratio of labor costs (**Chart 16**). The component ratio of ordinary profits rose 10.1% pt during the period from 2003 to 2007, of which 8.2% pt stems from the reduction of labor costs.

As for small and medium–sized enterprises (SMEs), both the contraction of the component ratio of labor costs and the expansion of the component ratio of ordinary profits remain subdued. The component ratio of ordinary profits rose only 2.4% pt during the period from 2003 to 2007, of which 0.7% pt stems from the reduction

of labor costs and 0.6% pt from the reduction of interest costs.

Chart 16: Change in component ratio of value added (by corporate size)

Note: "Large corporations" = capital of 1 billion yen or over,
    "small corporations" = capital of 10 to 100 million yen.
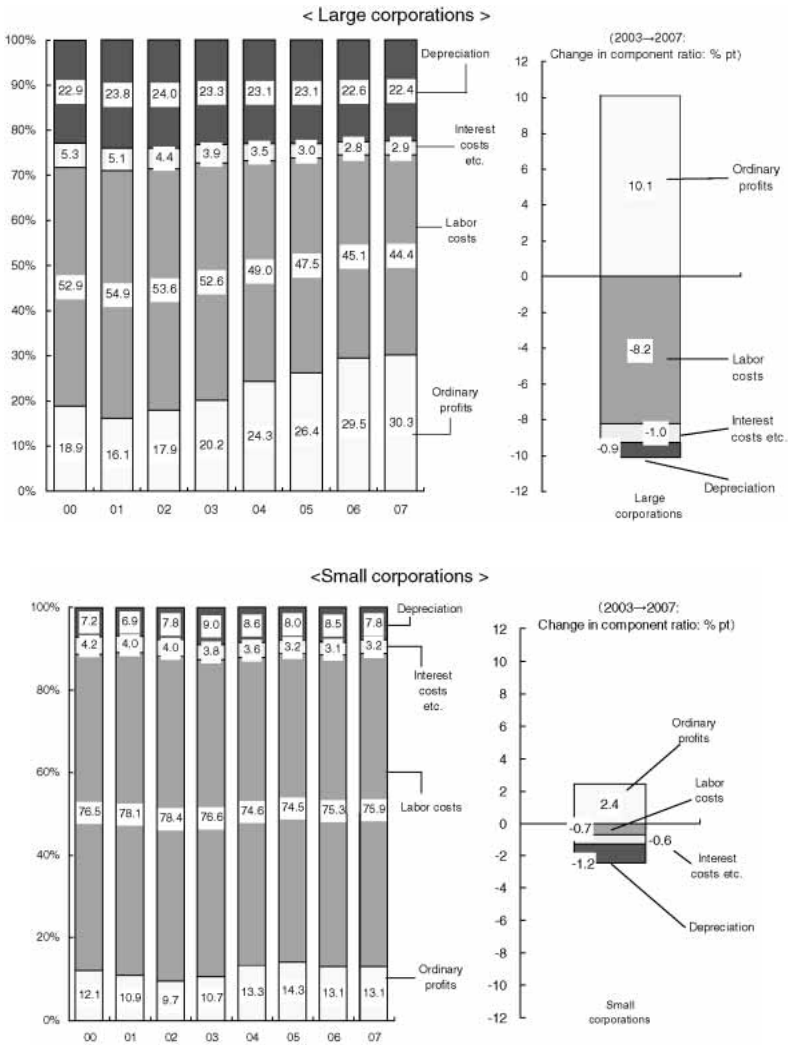Source: Ministry of Finance, *Financial Statements Statistics of Corporations by Industry, Quarterly.*

A look at the distribution of income among between the corporate and household sectors in the *National Income Statistics* reveals that up to around 2004 before Japan's terms of trade started to worsen, corporate profits continued to rise through the reduction of labor costs (**Chart 17**). By 2005, labor compensation growth started to pick up along with the rise of corporate profits, showing nascent signs of a virtuous cycle of the expansion of value added. However, what actually ensued was the outflow of income from corporate enterprises due to worsening terms of trade while labor compensation continued to rise amid the improvement of labor market conditions. As a result, corporate profits started to worsen, placing the corporate sector at a disadvantage to the household sector in income distribution, leading to an upturn of the labor distribution rate (note 4) in 2006 from a downtrend up until then (**Chart 18**).

Ordinarily, the rise of the labor distribution rate can be explained in terms of wage growth in relation to labor productivity. However, in times of massive income drains such as the current circumstances, corporate enterprises must set wage levels at appropriate levels in consideration of such income drains. Since either the corporate sector or the household sector must ultimately bear the burden of income drains from within the country, the payment of wages commensurate with productivity would result in the corporate sector bearing the entire burden of the income drains.

Chart 17: Factor decomposition of the generation of income account
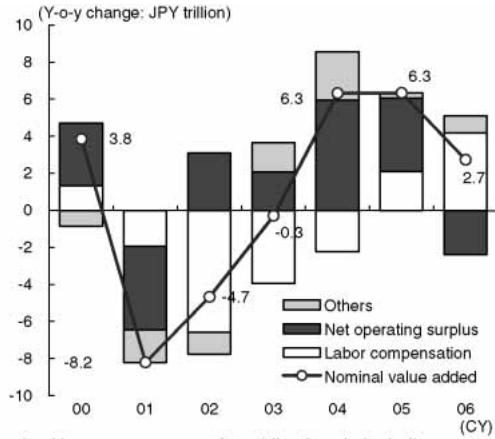
Note: Others = net mixed income + consumption of fixed capital + indirect taxes and subsidies.
Source: Cabinet Office, *National Income Statistics*.

Chart 18: Labor distribution rate
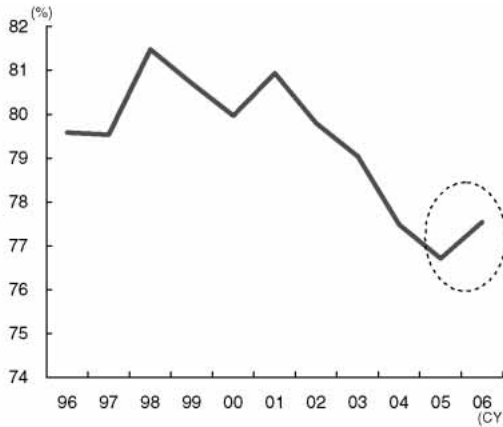
Note: Labor distribution rate
= labor compensation ÷ (labor compensation + net operating surplus).
Source: Cabinet Office, *National Income Statistics*.

The rate of wage growth in which the burdens borne by the household and corporate sectors are equal – in other words the rate
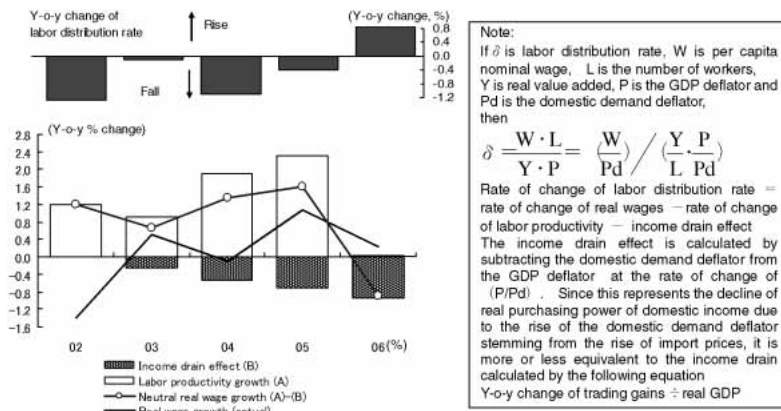
of wage growth which keeps the labor distribution rate constant – (hereinafter referred to as the "neutral rate of real wage growth") is derived by subtracting the rate of decline of real income (hereinafter referred to as the "income drain effect") from labor productivity. In terms of the entire economy, the income drain effect would be more or less equivalent to the year–on–year change of trading gains divided by real GDP (note 5). In **Chart 19**, the line represents the actual real wage growth and the neutral rate of real wage growth and the bars represent productivity growth since 2002 and income drain effect which serve as factors pushing up the neutral rate of real wage growth. In the same chart, the upper graph represents the year–on–year change of the labor distribution rate.

Since the beginning of 2003, the income drain effect has been gradually intensifying at a faster pace, pushing down the neutral rate of real wage growth. On the other hand, the rate of actual wage growth picked up in 2006 while productivity growth weakened in 2006. As a result, the rate of actual real wage growth surpassed the rate of neutral real wage growth, leading to the rise of labor distribution rate.

Chart 19: The neutral rate of real wage growth

Note:
If δ is labor distribution rate, W is per capita nominal wage, L is the number of workers, Y is real value added, P is the GDP deflator and Pd is the domestic demand deflator, then

$$\delta = \frac{W \cdot L}{Y \cdot P} = \left(\frac{W}{Pd}\right) \Big/ \left(\frac{Y}{L} \cdot \frac{P}{Pd}\right)$$

Rate of change of labor distribution rate = rate of change of real wages − rate of change of labor productivity − income drain effect. The income drain effect is calculated by subtracting the domestic demand deflator from the GDP deflator at the rate of change of (P/Pd). Since this represents the decline of real purchasing power of domestic income due to the rise of the domestic demand deflator stemming from the rise of import prices, it is more or less equivalent to the income drain calculated by the following equation

Y-o-y change of trading gains ÷ real GDP

Sources: Cabinet Office, *National Income Statistics*, Ministry of Internal Affairs and Communications, *Labor Force Survey*, Ministry of Health, Labor and Welfare, *Monthly Labor Survey*.

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## 4. The impact of the deterioration of terms of trade upon demand

(1) The impact upon demand

The following section shall deal with the impact of the deterioration of terms of trade upon demand.

Generally speaking, when the deterioration of terms of trade leads to (1) homegrown deflation, even though domestic demand would drop due to the direct fall of domestic income, exports would still have a chance to rise since the rise of export prices may be averted. On the other hand, if the deterioration of terms of trade leads to (2) domestic demand inflation, domestic demand would remain relatively solid while exports may weaken due to the loss of price competitiveness.

Broadly speaking, domestic demand inflation (100% pass–through of costs to prices) shifted into homegrown inflation in the 1st Oil Crisis while a moderate homegrown deflation shifted into domestic demand inflation (100% pass–though of costs to prices) in the 2nd Oil Crisis. Comparing demand in the early part of each oil crisis when there were differences in the pass–through of costs to prices, exports fell while domestic demand remained on solid footing during the 1st Oil Crisis (**Chart 20**). During the 2nd Oil Crisis, exports continued to rise even though domestic demand was weaker than in the 1st Oil Crisis. While we have excluded all economic conditions other than price developments, both external and domestic demand have more or less moved in line with the general view.

Chart 20: Domestic and external demand during the 1st and 2nd Oil Crises
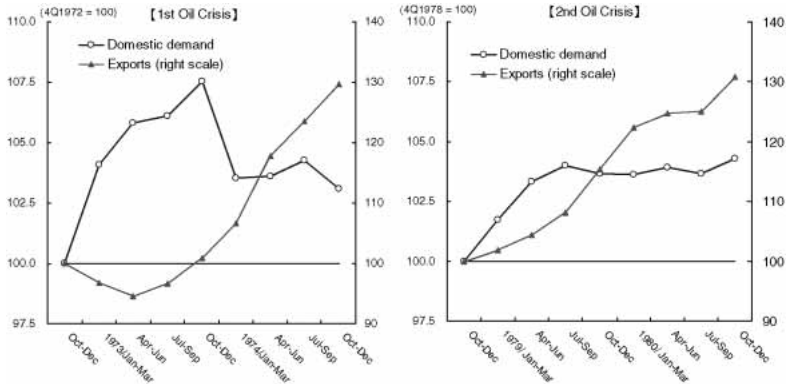
Note: Exports and domestic demand are Indexed at 100 at the start of the 1st and 2nd Oil Crises.
Source: Cabinet Office, *National Income Statistics*.

Judging from the limited rise of domestic prices and the fact that Japan's exports have retained their price competitiveness during the current downturn of terms of trade, Japan can still look forward to the expansion of exports. On the other hand, the decline of domestic income provides reasons to be concerned regarding a possible drop of domestic demand.

In fact, of Japan's real GDP growth in the Jan–Mar quarter of 2008 (1.3% y–o–y), the contribution by external demand was 1.4% pt while the contribution by domestic demand was –0.1% pt, clearly portraying that exports are booming in contrast to slumping domestic demand (**Chart 21**).
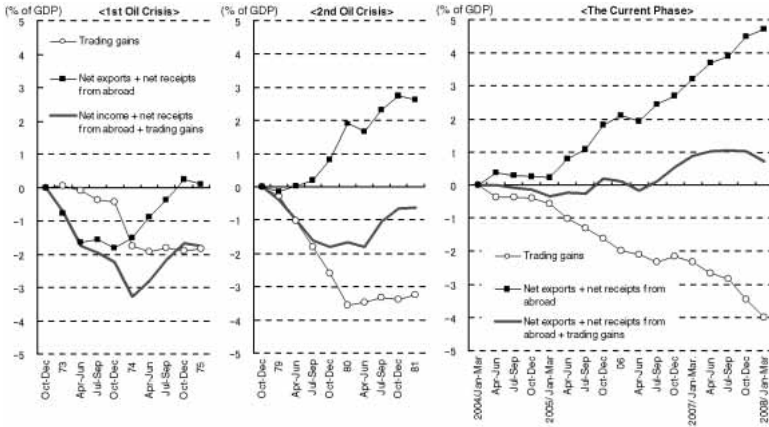
Chart 21: Contributions to real GDP by domestic and external demand

(Y-o-y % change)

■ Contribution by external demand
□ Contribution by domestic demand
— GDP
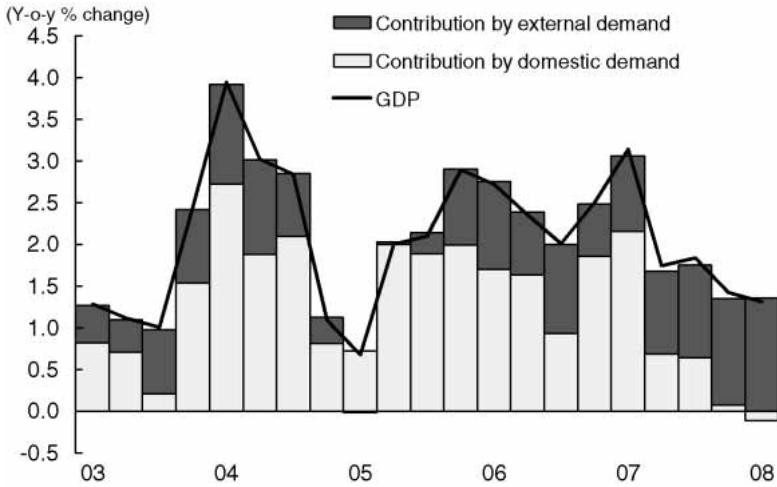
Source: Cabinet Office, *National Income Statistics.*

One of the characteristics of the current deterioration of terms of trade in comparison to the past oil crises is the fact that the expansion of real net exports and net income from abroad is surpassing the deterioration of trading gains (**Chart 22**). The difference most likely stems from the fact that the rise of crude oil prices during the past oil crises was due to supply–side factors and led to a sharp global economic downturn. In contrast, note that while there is a speculative aspect to the current rise of crude oil prices, its fundamental cause is a tighter supply–demand balance and that the global economy is still continuing to expand.

Chart 22: Income trends accompanying external transactions

(% of GDP) <1st Oil Crisis>   (% of GDP) <2nd Oil Crisis>   (% of GDP) <The Current Phase>

— Trading gains

— Net exports + net receipts from abroad

— Net income + net receipts from abroad + trading gains

— Trading gains

— Net exports + net receipts from abroad

— Net exports + net receipts from abroad + trading gains

Note: Trading gains during the past oil crises are estimates by MHRI.
Source: Cabinet Office, *National Income Statistics*.

Furthermore, in terms of domestic demand, the contribution by personal consumption to real GDP growth in the Jan–Mar quarter of 2008 was 0.8% pt while the contribution by capital investment stood at –0.1% pt. The deterioration of capital investment most likely stems from the decline of corporate profits. While corporate enterprises had maintained their levels of fixed investment by raising their investment propensity up to around 2007, there are signs of a change in such investment stance (**Chart 23**) and should serve as negative pressures upon capital investment for some time.

Chart 23: Investment propensity
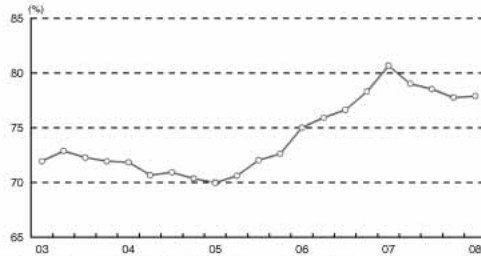
Note: Investment propensity = capital investment ÷ cash flow,
   Cash flow = ordinary profits × 0.5 + depreciation. 4Q moving average.
Source: Ministry of Finance, *Financial Statements Statistics of Corporations by Industry, Quarterly.*

Meanwhile, as shown by the sharp rise of consumer prices from the beginning of this year, there are signs that more corporate enterprises are passing through the rise of costs to output prices.

As set forth in **Chart 8**, the pass–through ratio of costs to prices is estimated to be extremely low – approximately 15% or so – during the period from the 1st quarter of 2004 to the end of FY2007. This is serving as a growing burden upon corporate enterprises, making it unlikely that the pass–through of costs to prices will remain low. On the basis of several premises (note 6), if the pass–through ratio remains at 15%, unit profit in 2008 would decline for the third year in a row since 2006 and fall a sharp 14% in comparison with 2005 (**Chart 24**). Looking forward, the pass–through of prices is predicted to rise. Assuming that the pass–through ratio rises to 50%, domestic prices would rise 2.1% and the full (100%) pass–through of prices would lead to a sharp rise of 4.6% (**Chart 25**).

Chart 24: Unit profit at a pass–through ratio of 15%
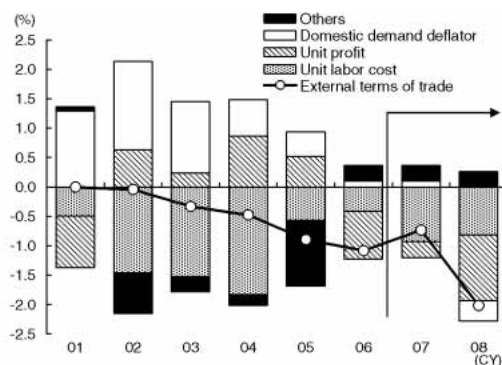
Note: External terms of trade for 2007 are based upon actual readings and those for 2008 are based upon estimates by MHRI. Unit labor cost for 2007 is based upon actual readings on labor compensation and unit labor cost for 2008 is based upon the assumption of 0% y-o-y change of labor compensation. Unit profit is estimated on the basis of operating profits in the *Financial Statements Statistics of Corporations by Industry, Quarterly* with respect to 2007 and the residual for other factors with respect to 2008. Other factors for 2007 are based upon the residual and the assumption that the rate of contribution in 2007 will continue with respect to 2008.
Sources: Cabinet Office, *National Income Statistics*, Ministry of Finance, *Financial Statements Statistics of Corporations by Industry, Quarterly.*

Chart 25: The pass–through ratio and the domestic demand deflator

Pass-through ratio	Rate of rise of domestic demand deflator (%)
20%	0.6
30%	1.1
40%	1.6
50%	2.1
100%	4.6

Note: Calculated based upon the equation in the note to Chart 8.
Source: Cabinet Office, *National Income Statistics.*

Given the dour household income environment, corporate enterprises remain cautious about passing through costs to final demand goods, leading to our view that the chances of a sharp rise of the pass–through ratio are slim. Having said so, considering the limited pass–through of costs thus far, there is the possibility that the spread of the consensus view that "prices will rise" coupled with the deterioration of corporate profit environment will serve to accelerate the pass–through of costs to prices. In such event, real income among households would decrease. So far, the rise of consumption propensity had compensated for the weakness of household income growth, thereby serving as a driver of consumer spending. However, since such conditions are not sustainable and that the level of the propensity to consume is already high, it is necessary to take note that the drop of real income may trigger the fall of personal consumption.

(2) The impact upon domestic and external demand under the subsequent improvement of terms of trade

The next section shall examine the subsequent improvement of terms of trade following the current deterioration.

Given the following relational expression

real GDI = real GDP + trading gains,

the growth of real income surpasses the rate of real GDP growth due to an upturn (either a contraction of the breadth in negative territory or a rise into positive territory) of trading gains in times of the improvement of terms of trade. On the other hand, given the following relational expression

real GDI = real domestic demand + real net exports + trading gains,

the growth of real domestic demand falls below the growth of real income as far as real net exports do not fall below the improvement of trading gains.

Looking back at the oil crises in the past, the growth of real domestic demand surpassed the growth of real GDI in times of the deterioration of terms of trade and the growth of real domestic demand fell below the growth of real GDP during the upturn of

terms of trade (**Chart 26**). Furthermore, in the growth of real GDP during the improvement of terms of trade, real net exports served as a major contribution along with the improvement of trading gains (**Chart 27**).

Chart 26: Terms of trade, real GDI and domestic demand
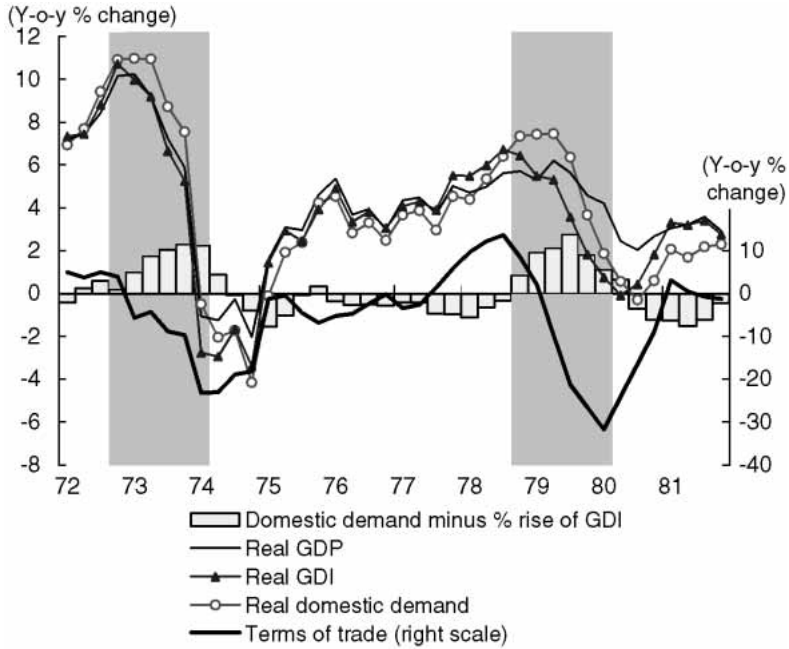
Source: Cabinet Office, *National Income Statistics.*

Chart 27: Factor decomposition of real GDI

(Y-o-y % change)

Contribution by domestic demand
Contribution by trading gains
Contribution by net exports
GDI
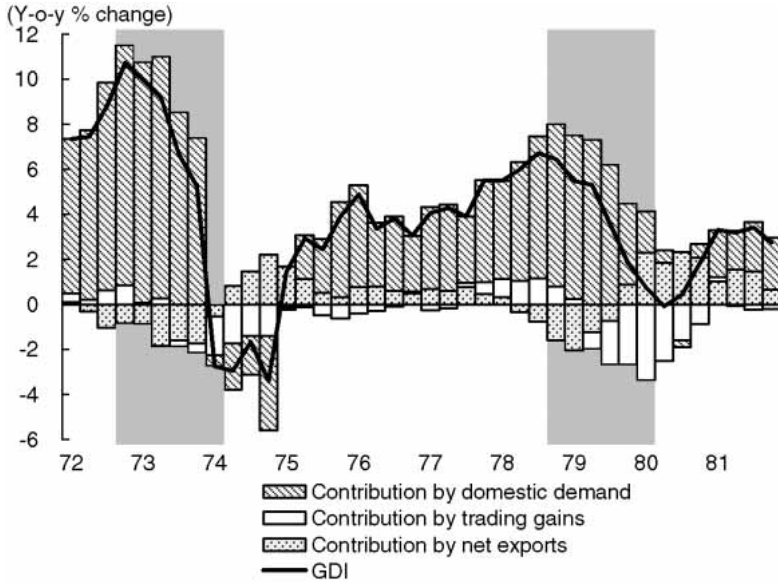
Source: Cabinet Office, *National Income Statistics*.

During the subsequent improvement of terms of trade, domestic demand is predicted to remain weak even if it manages to climb out of a slump. Therefore, a "virtuous cycle of domestic demand and domestic income" as observed in past cycles, may not be expected any time soon, meaning that Japan's economic recovery will remain dependent upon external demand for some time.

It is necessary to note that it is unlikely at the current juncture that external demand will serve as the driver of the economy in terms of both price (trading gains) and quantity (real net exports) as in the recovery of terms of trade subsequent to the past oil crises.

In the past oil crises, the deterioration of terms of trade due to the rise of crude oil prices led immediately to the slowdown of leading industrialized economies. On the other hand, when the price of crude oil subsequently fell, the industrialized economies recovered along with the improvement of terms of trade. As stated before, this

stems from (1) the rise of crude oil prices being primarily a supply–side problem, and (2) the small size of domestic demand of oil–producing countries and the large weight of the leading industrialized countries in the world economy.

In contrast, note that (1) the current surge of crude oil prices stems from factors including a supply–demand crunch amid the expansion of the world economy, (2) the oil–producing countries and emerging economies are gaining a larger role in the global economy. These factors have led to Japan's worsening terms of trade in overseas transactions on one hand and the expansion of real net exports, in other words an "antithesis" of price and quantity in overseas transactions (**Chart 22**).

Even though the recent surge of crude oil prices may not be explained solely by supply and demand, should the future improvement of terms of trade result from the fall of crude oil demand and ultimately the deterioration of the world economy, the odds are high that just the opposite "antithesis" may occur; in other words, the improvement of trading gains and the deterioration of real net exports.

So far, Japan has managed to maintain income gains in terms of overall overseas transactions since the positive effect of real net exports has surpassed the negative effect of trading gains. Looking forward, however, the decline of income with respect to overall overseas transactions is highly probable in the event Japan's terms of trade improves.

Even though the improvement of terms of trade may serve as a great benefit for corporate enterprises in terms of the distribution of domestic income, it will take time for the benefit to spread to the rise of demand. Thus, the Japanese economy may remain sluggish even after the improvement terms of trade.

5. Concluding remarks

As observed above, the deterioration of terms of trade is serving as a major blow upon Japan's economy. Despite the deterioration of Japan's terms of trade, its income from overseas transactions is rising due to the increase of real net exports, reflecting the strength of the emerging economies. Even so, Japan's worsening terms of trade has had a significant negative impact upon the corporate sector. If the income drains are channeled back into Japan, the reflux of money may serve as a stimulus upon demand through the fall of interest rates. However, given the prolonged period of low interest rates in Japan, lower interest rates are not serving as a driver of demand because of the weak interest rate sensitivity of domestic demand.

On a global scale, even though the rise of crude oil prices would lead to income shifts from commodity–importing countries to commodity–exporting countries, gross global income would remain unchanged. Furthermore, on a country–to–country basis, the rise of domestic demand in commodity–exporting countries which have contributed to the rise of income is leading to the rise of exports of commodity–importing countries which have contributed to the fall of income. Thus, this leads to our view that overseas transactions only had a limited impact upon total income among each of the countries, given a structure in which commodity–importing countries experienced both the deterioration of terms of trade and rise of real net exports and commodity–exporting countries experienced the improvement of terms of trade and the fall of real net exports.

However, the recent surge of commodity prices such as crude oil is outpacing the rise of domestic demand in commodity–exporting countries, most likely leading to a larger negative impact upon commodity–importing countries. Under these circumstances, there are rising expectations toward the impact of the reflux of money from commodity–exporting countries to commodity–importing countries. The reflux is having a certain effect, as shown by

sovereign wealth funds' investment in US and European financial institutions. On the other hand, the reflux of petrodollars is creating a "liquidity glut" which is serving as the source of investment funds spurring a further rise of crude oil prices and amplifying the volatility of the market. The measures taken by the US and European monetary authorities toward the financial market turmoil triggered by the subprime crisis have had a considerable effect in avoiding a sharp credit crunch. However, the measures appear to have put off the problem regarding the liquidity glut. Given the signs of a global economic slowdown, the key to the future course of the global economy will rest upon how to guide both money flows and the real economy onto a soft landing.

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Notes:

1. In this respect, the pass–through of costs to prices is referred to at times as "a toll on households". However, since the income drains accompanying the rise of import prices must be borne by either the corporate or household sectors, the corporate sector would bear the entire burden in the absence of a pass–through while both the corporate and household sectors would bear equal burdens in the event of a 100% pass–through since the labor distribution rate would remain unchanged and both the corporate and household sectors would suffer the rise of domestic prices and decline of real income.
2. Refer to the note to **Chart 7**.
3. Refer to the note to **Chart 8** for the method of estimation.
4. Refer to the note to **Chart 18** for the definition of the labor distribution rate.
5. Refer to the note to **Chart 19**.
6. Refer to note to **Chart 24**.

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