The Cost of Regulation in the Japanese Service Industry

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9.1 Introduction

World trade in services has increased notably in recent years. Between 1985 and 1995, world exports of services increased at the average annual rate of 11.9 percent, faster than goods exports, which increased at the annual rate of 9.6 percent. The size of world export of services was approximately one quarter of that of world exports of goods in 1995.

Despite the recent increase in service trade, there exist a number of impediments to trade in services. According to a study by PECC (1995) of the frequency measures of the impediments to trade in services for 16 APEC economies, as high as 77.6 percent of possible service markets are impeded, indicating closed service markets. Although no precise numbers are given, the Japanese service market is shown to be more closed than the U.S. market.

A closed service market entails the cost to the economy. In the closed market, the prices of services are likely to be high and productivity is likely to be low because the competition is limited. Service consumers lose from high prices and low productivity. Since services are purchased not only by consumers for the purpose of final consumption such as the case of education and medical services, but also by firms in the form of intermediate services in the cases of transportation, communications and others, high prices and low productivity in the service sector are likely to impose substantial cost to the economy.

The purpose of this paper is to examine quantitatively the cost of Japan's closed service market to its economy. We estimate the cost by undertaking counterfactual simulations with the use of a computable general equilibrium (CGE) model[1]. Through provision of a virtually realistic "economy", CGE models enable one to examine effectively the impact of policies such as regulations on the economy.

The paper begins with a brief description of the service sector in Japan in section 2, to set the stage for the following analyses, then turn to an analysis of the cost of regulation in the service sector in Japan by using a CGE model in section 3. In section 4 some concluding comments are given.

9.2 Service Sector in the Japanese Economy

The service sector has increased its importance in the Japanese economy over time. For example, the shares of the service sector in total value added and employment increased respectively from 67 and 62 percent in 1980 to 76 and 73 percent in 1993. The increasing importance of the service sector, which is observed in the Japanese economy, can also be found in other developed countries. Both demand-side and supply-side factors can explain such a trend.

To begin with the demand-side factors, final demand for services by consumers tends to increase faster than that for non-services such as primary products, and manufactured products, once the income level of consumers reaches a certain level. Consumers' demand for non-services is satisfied first, and then their demand shifts to services. Typical examples of such services are higher education and entertainment. Intermediate demand for services, such as distribution, telecommunications and transportation, also tends to increase with the

[1] See Robinson (1988) for a discussion of CGE models.

level of economic development. With an increase in production as a result of economic development, a complex system of economic activities involving numerous economic agents is formed. Under such an economic environment, it is beneficial for the economic agents such as firms to specialize in certain activities, giving rise to intermediate demand for services. When the level of production is low, transportation services such as shipping is carried out by the producers. But when the level of production increases, producers find it profitable to utilize the transport services supplied by outside sources and to specialize in their own production.

Turning to the supply-side factors explaining the increasing importance of the service sector in the Japanese economy, one notes that the factors of production required to produce services has increased with the level of economic development. In the early post WWII period, the Japanese economy was abundantly endowed with unskilled labor, giving advantage in the production of low-tech manufactured products. As a result of provision of "high-quality" education and active research and development, the quality of Japanese labor force has been upgraded and become suitable for the production of high-tech manufactured products and high-tech services such as telecommunications.

An examination of the sectoral breakdown of the service sector in terms of production and employment reveals wide variations in the positions of sub-sectors of the service sector. In terms of output (value added), construction, distribution, and real estate have relatively large shares, respectively accounting for 10.3 (9.4), 9.9 (13.8), and 6.5 (11.1) percent of all industries. As for employment, the distribution sector has by far the largest share, accounting for 20 percent of total employment, which is followed by construction at 10 percent. It should be noted that retail services is labor intensive as its share in total employment at 12.3 percent is significantly greater than the corresponding share in output (3.7%) or value added (5.2%), indicating low labor productivity of that sector.

To investigate further the importance of the service sector on the Japanese economy, we computed the "elasticity" of the price change of a particular service sector on the prices of other sectors as well as its own by explicitly taking inter-industry linkages into consideration.

We computed the cross as well as own "elasticities" for 162 sectors by using a 162x162 input-output table for 1993, producing a 162x162 matrix. Instead of reproducing a large matrix, we present the summary statistics with a focus on the service sectors in Table 9-2.

According to the results, one finds that 1 percent decline in the price of residential construction leads to 0.01 percent decline in overall price level. Among the service sub-sectors, the impact of price changes in the distribution sector (wholesale and retail sales), financial services, real estate, and restaurants is large. Specifically, 1 percent decline in the prices of wholesale, retail sales, financial services, real estate and restaurants would result in 0.09, 0.04, 0.05, 0.08, and 0.06 decline increases in overall price level. These observations indicate that the services offered by these sectors are extensively used as inputs in the production of other sectors, and therefore the decline in the prices of these services would benefit the Japanese producers greatly. This point can be clearly seen from the figures shown in the columns 2-17 in Table 9-2. For example, the impact of the change in the price of wholesale services is strongly felt in other sectors, as 1 percent decline in the price of wholesale services can be translated into 0.02-0.09 percent decline in the prices of the products in other sectors.

Before turning to the next subject, let us examine the magnitude of the impact of the price change originated in the sectors taken up for this study. We have already discussed distribution and financial services, and therefore we examine construction, insurance, transportation, communications, and medical and health services. According to our results, 1 percent decline in the prices of construction (construction for the facility of public utility), insurance, transportation (road freight transport), communications, and medical and health services would result in the decline in overall price level by the following magnitude: 0.02, 0.01, 0.02, 0.02, 0.01 percent. These figures, which are smaller than those observed for the distribution and financial services, reflect limited use of these services as inputs for the production in other sectors.

So far we have examined the position and importance that the service sector has in the Japanese economy. Let us now compare the Japanese service sector with its U.S.

counterpart. Here we are interested in the efficiency of the service sector. We take up two indicators for comparison, price and TFP (total factor productivity) levels. Table 9-3 shows the differences in the prices and TFP between Japan and the U.S. for 162 sectors in 1990. The figures are constructed in such a way that the U.S. value is unity. Since the main subject of this paper is the service sector, we focus our discussion on the service sector. However, we use the information on price and TFP differences for all the sectors in one of the simulations in a later section.

An examination of the figures in Table 9-3 reveals that the prices of services in Japan are significantly higher than those in the U.S., while the levels of TFP in Japan are lower compared to those in the U.S. Similar to the case for services the manufactures' prices are higher in Japan. However, it is interesting to note that unlike the case in services TFP levels for a number of manufacturing sub-sectors are higher in Japan. These differences have important implications on the outcome of simulations to be undertaken below.

Coming back to the discussion on services, the prices of construction services, financial services, transportation services, and other services in Japan are more than twice as high as those in the U.S. In particular, the prices of road freight transport and storage services, building maintenance, legal, financial, and accounting services, and other business services are very high. In general, those sectors where prices are high exhibit low TFP levels. For example, the levels of TFP in road freight transport and storage, building maintenance, legal, financial, and accounting services, and other business services are less than 40 percent of the levels in the U.S.

There are only four service sub-sectors where the prices in Japan are lower than those in the U.S.: air transport and related services, education and research, non-profit organization, and medical and health services. For twelve service sub-sectors, the TFP level in Japan is higher than that in the U.S. One would think that there is close correspondence between the price differentials and TFP differentials in such a way that high prices correspond to low TFP. The figures in Table 9-3 are more or less consistent with this expectation as

discussed above, but there are some sub-sectors where both high prices and high TFP are found in Japan. Specifically, in water supply, real estate, communications, railroads, other transport services, motor vehicle repair, other amusement and recreation services, and information and computer services, both prices and TFP levels in Japan are higher than those in the U.S. This "anomaly" can be explained by market distortions which are mainly caused by government's regulations. Indeed, the consumers of these services are forced to pay high prices, while the producers earn excess profits.

9.3 The Impact of Deregulation in Services: A Simulation Using a CGE Model

We have found that the Japanese service sector is characterized as high prices and low productivity. One would then be interested to know the impact of high prices and low productivity on the Japanese economy. In this section we examine this issue by conducting counterfactual simulations by using a CGE model. Specifically, in our "deregulation" case, to examine the impact of high prices and low productivity in the service sector, we undertake a simulation under which the level of TFP of the Japanese service sectors were to increase to the level of the U.S.[2]. We then compare the results of simulation with the base case, to discern the impact of low productivity and high price to the Japanese economy. In addition to the deregulation simulation, we carry out a series of simulations to examine the impact of high prices and low productivity in services and other sectors. One of the simulations is a "free trade" case, where restrictions on trade in tradable sectors including primary and manufactured products are removed.

One could obtain useful information of the impact of deregulation from the "elasticities" of the price change computed earlier. However, there are at least two shortfalls

[2] It is assumed that deregulation would result in more competition, which in turn would lead to lower prices and higher productivity.

associated with the estimation of the elasticities, in order to assess the impact of deregulation on the economy. First, the elasticities computed by using an input-output table concern the interaction among the sectors in production only, and they do not take account of the impact of final demand such as final consumption, investment, exports, or imports. To explicitly consider the impact involving these aspects, simulation exercises using a CGE model are useful. Second, the estimation of the elasticities concerns the impact of a change in one sector only, and thus one cannot estimate the impact when a change is made in a number of sectors. This problem can be effectively dealt with by using a CGE model, as it enables one to conduct a simulation under which a change is made in more than one sector.

In order to discern the impact of high cost and low efficiency, we carry out a series of simulations by increasing the level of TFP exogenously. Since the prices are endogenously determined in the CGE models, they cannot be changed exogenously[3]. It should be noted that the prices would change as a result of the changes made in TFP. In the following we first examine the impact of 20 percent increase in the level of TFP for the services sectors under study. The purpose of this exercise is to examine the magnitude of the impact from the improvement in TFP by different sectors. Because of the characteristics of this exercise, we call it "sensitivity" analysis. We then perform a series of simulations under which we assume that the TFP levels of concerned sectors would increase to the levels observed in the U.S.

Sensitivity Analysis

Before conducting simulations for free trade and deregulation scenarios, we conduct several "sensitivity" analyses. In the sensitivity analyses, which are performed to examine the magnitude of the impact caused by deregulations in the service sub-sectors, TFP levels for seven service sub-sectors under our examination are increased one by one by 20 percent.

[3] To be more exact, in our CGE model, foreign prices are exogenously given, and domestic prices are endogenously determined. Furthermore, we treat services as non-tradable, that is, there are no trade or no foreign prices in our model. As such, we adjust TFP in the deregulation simulation. In contrast, primary and manufactured products are traded, and therefore, in our "free trade" simulation, both foreign prices and TFP are adjusted.

The results of the sensitivity analyses are shown in Table 9-4. As expected, an improvement in TFP leads to lower prices and higher levels of real wages, income, consumption, and GDP. There are wide variations in the magnitude of these changes among different cases where the improvement in TFP takes place in different service sub-sectors.

The largest increase in GDP of 4.5 percent is observed when an increase in TFP takes place in construction services. The improvement in productivity in construction services encourages fixed investment by lowering the price of construction services. The increase in fixed investment in turn results in higher GDP. Indeed, a 20 percent increase in the level of TFP in construction services leads to a decline in the price of investment goods (PI) by 9.8 percent, which in turn results in the increase in private fixed investment (VIP) by 12.0 percent.

An increase in the level of TFP in the distribution sector (wholesale and retail sales) also results in a significant increase in GDP. Specifically, a 20 percent increase in the level of TFP in the distribution sector leads to 3.6 percent increase in GDP. In this case, private consumption as well as fixed investment are promoted by lower prices of consumption and investment goods, which are caused by the increase in productivity in the distribution sector. It is important to note that consumers benefit greatly from the improvement in the productivity in the distribution sector, as a 20 percent increase in the level of TFP in this sector increases the real wages and real disposable income by 1.8 and 3.4 percent, respectively.

The impact on consumption and investment of an improvement in productivity in transportation is similar to that observed for distribution. But the magnitude is smaller by approximately 50 percent. A 20 percent increase in the level of TFP in the transportation sector results in 1.7 percent increase in GDP.

For the other sectors, an improvement in productivity has much smaller impact on the economy. In terms of GDP, a 20 percent increase in TFP for financial services, medical services, communications, and insurance would lead to an increase in GDP by 0.8, 0.5, 0.4 and 0.4 percent, respectively.

An examination of the impact on the sectoral prices of the changes in the level of TFP

for the sectors under study reveals that the impact induced by the construction services sector differs from that induced by other services sectors. In the case where productivity improves in construction services, the producers' prices decline in construction services, electricity, gas, and water, and real estate. In contrast, for the case where productivity improves in other service sectors, the producers' prices in all the sectors decline, albeit at small magnitude. These contrasting impacts can be explained by different inter-industry relationships under which these sectors are involved. Construction services are mainly used in construction only, while other services are used in many sectors. As such, the improvement in productivity for the services other than construction service is translated into lower prices not only for their own services but also for other services and products. In this regard, it is noteworthy that an improvement in the level of TFP in distribution and in transportation leads to a significant reduction in the prices of other products.

One of the serious problems caused by an improvement in productivity would be redistribution of workers, which entails adjustment cost. The bottom portion of Table 9-4 clearly points out this problem, as an improvement of productivity in a particular sector leads to a decline in employment in that sector. The serious impact from a 20 percent increase in TFP is felt in transportation, financial services, and distribution, as they experience in the decline in employment by 12.7, 10.0 and 8.9 percent. These are expected outcome. However, there are some surprising results. Specifically, the mining sector incurs substantial loss in employment from an improvement in productivity in transportation. Somewhat at a smaller degree, employment in textiles is affected negatively by an improvement in productivity in the distribution sector. General equilibrium effects are at work behind these outcome.

The Impact of Free Trade and Deregulation

In order to examine the impact of high price and low productivity in the Japanese economy, in particular those in the service sector, the following three simulations are performed:

Simulation 1: price and TFP differentials between international (U.S.) prices and domestic prices are eliminated in the tradable primary and manufacturing sectors. This is the free trade scenario, as free trade would eliminate price differentials and improve productivity of domestic producers by imposing competitive pressure.

Simulation 2: productivity differentials in non-tradable service sectors are eliminated. This is the deregulation scenario. Since services are not tradable, free trade of services cannot be applied. Deregulation of the services sectors is expected to reduce prices and improve productivity. We undertake the deregulation exercise by increasing the level of TFP of Japanese service sectors to the U.S. level. As was noted earlier, in our CGE model we cannot set the prices of non-tradable services exogenously since they are determined endogenously in the model.

Simulation 3 (combination of simulations 1 and 2): price differentials in tradable sectors and TFP gaps in the tradable and service sectors are eliminated. Simulation 3 may be considered as a free trade and regulation-free regime.

The results of the simulations are shown in Table 9-5. To begin with the free trade case, one observes that free trade would increase GDP by 1.4 percent. The main impetus comes from the increase in consumption, which results from the increase in real wages and real disposable income. The increases in real wages and real disposable income are in turn attributable to the reduction in the product prices, resulting from free trade.

The impact of free trade would be felt differently by different sectors. Production of primary products declines while that of manufactured products increases. This is consistent with the pattern of the changes in prices. As the level of prices of primary products are significantly higher compared to those of manufactured products in the pre-free trade situation, the prices of primary products decline more notably compared to those of manufactured

products as the result of free trade. Production of real estate and electricity, gas, and water increases significantly, as a result of free trade. This is because manufacturing production, which is activated because of free trade, induces the production of these services.

The impact of free trade on employment is serious in primary and manufacturing sectors. In particular, free trade would reduce employment in the primary sector substantially; employment in agriculture by 13 percent and mining by 11 percent. The decline in employment results from a combination of the reduction of the prices and the increase in TFP. Since the primary sector in Japan has characteristics of high prices and low productivity, free trade would affect the primary sector seriously.

Turning to the deregulation case, where the level of TFP for the Japanese service sector were to increase to the level equal to the U.S., one finds that GDP would increase significantly by 10 percent. Unlike the case of trade liberalization, a major factor behind the substantial increase in GDP is an expansion of fixed investment, which increases by 13.6 percent. It should also be noted that consumption increases significantly as well. Indeed, the rate of increase in consumption at 5.4 percent for the deregulation case is greater than that for free trade at 3.6 percent. A consumers would gain on average 136,000 yen a year from deregulation in the services sectors.

The expansion of investment and consumption is realized because of the decline in the prices of investment and consumption goods. Among the service sub-sectors, deregulation in the construction services contributes notably to the increase in GDP, as it reduces the price of construction services greatly by improving productivity of that sector. One should recall that the impact of the increase in productivity in construction services was found large in the sensitivity analysis.

Deregulation in the service sector leads to an increase in output for all the sectors in the economy. In particular, an increase in production is very large in construction service (20.3%), mining (15.2%), electricity, gas, and water (12.5%), real estate (12.1%), metal products (10.7%), and transportation (10.3%). Deregulation affects employment. Mining

sector employment is particularly hard hit, as it is almost halved. Such a dramatic decline in mining employment is attributable largely to its small size and low productivity in the pre-deregulation period. Because of the small base, the changes expressed in percentage would show up large.

The results of simulation 3, which considers both free trade in the tradable sector and deregulation in the non-tradable service sector, are shown in the last column in Table 9-5. The results are more or less the summation of the results obtained from simulations 1 and 2. GDP would increase by 12.2 percent from free trade and deregulation in the service sector. Consumption and investment would increase by 9.4 and 15.3 percent respectively, as the prices of consumption and investment goods decline by 19.0 and 13.2 percent. The benefits from the increase in consumption can be translated into the increase of the consumer surplus by 280,822 yen per person and by 898,632 yen per family. The prices of all the products and services decline as a result of free trade and deregulation. The rate of the decline is particularly large for primary products, construction services, transportation, and other services, each registering around 20 percent decline. Production of all the sectors increases, although there are wide variations in the rate of their increase. Roughly speaking, production of services increases more than that of other sectors. In particular, the rate of increase in production of construction services, real estate, and electricity, gas, and water is particularly high, exceeding 20 percent increase. In contrast, the rates of increase in the production in agriculture and foods are low around 3 percent.

The impact of free trade and deregulation on employment is diverse among different sectors. Although production would increase in all the sectors, employment in eight sectors (agriculture, mining, food, textiles, machinery, construction services, transportation, and other services) declines and that in the remaining seven sectors increases. Employment in mining declines sharply, while that in real estate expands significantly. These observations indicate that trade liberalization and deregulation would necessitate substantial structural adjustment, incurring large cost of adjustment.

9.4 Conclusions

The service sector has increased its importance in the Japanese economy, currently accounting for more than 70 percent of total value added and employment in the Japanese economy. Despite its importance, Japan's service sector is plagued with high prices and low productivity. The cost of high prices and low productivity in the service sector to the Japanese economy is estimated to be substantial by using a CGE model. Specifically, the cost of high prices and low productivity in the service sector amounts to 10 percent of GDP, and 136,000 yen in terms of per capita consumption. The cost is greater, amounting to 12 percent of GDP and 280,000 yen worth of per capita consumption, when high prices of tradable goods are taken into account.

Our estimated results indicate that policies such as deregulation in the service industry and trade liberalization in the tradable sector, which would reduce high prices and improve productivity, should be implemented. However, it is important to note that such policies result in the redistribution of workers among different sectors. Indeed, as large as 60 percent of workers in mining sector are likely to lose employment. It is therefore important to introduce assistance programs such as income transfer and retraining, in order to reduce the cost of adjustment.

Our CGE model turns out to be a useful tool to analyze the impact of high prices and low productivity of the service sector. However, there are some areas, which were not adequately dealt with in our CGE model and thus are left as agenda for future research. Among them, we would like to raise two issues, which are directly related to modeling the service sector. The first issue is incorporation of service trade in our CGE model. Some services such as transportation and communications are traded internationally, but our CGE model treated all services as non-tradable. A lack of necessary information on services trade

such as its mechanism and statistical data precluded us from incorporating service trade in our model. The other issue is incorporation of foreign direct investment. Provision of some services such as construction and retail sales in a foreign country requires the presence in that country. In such a case, foreign direct investment is required for supplying services overseas. As the importance of service trade and foreign direct investment is likely to increase in the future, these two issues should be given a high priority in modeling exercise.

Appendix Equations of the Model

1. Production Block

(1) Prices of imported goods

$$p_{IMi} = (1+\bar{t}_{I1ai}+\bar{t}_{I1bi}+\bar{t}_{I1ei})\,\bar{p}_{Wi}\cdot\overline{exr}$$

(2) Demand shares of imported goods

$$a_{IMi} = b_{IMi1}+b_{IMi2}\ln(p_{IMi}/p_{Di})+b_{IMi3}\bar{a}_{IMi}(-1)$$

(3) Prices of composite goods

$$\ln p_{Oi} = a_{IMi}\ln p_{IMi}+(1-a_{IMi})\ln p_{Di}$$

(4) Prices of material goods

$$\ln p_{Mj} = \sum_i \frac{p_{Oi}b_{IJij}}{\left(\sum_i p_{Oi}b_{IJij}\right)}\ln p_{Oi}, \quad \sum_i b_{IJij} = 1$$

(5) Cost shares of labor, capital, and material

$$a_{Kj} = b_{Pj2}+b_{Pj5}\ln(p_K/p_{Mj})+b_{Pj6}\ln(p_L/p_{Mj})+b_{Pj8}\ln t$$

$$a_{Lj} = b_{Pj3}+b_{Pj6}\ln(p_K/p_{Mj})+b_{Pj7}\ln(p_L/p_{Mj})+b_{Pj9}\ln t$$

$$a_{Mj} = 1-a_{Kj}-a_{Lj}$$

(6) Prices of domestic production

$$\ln p_{Dj} = \ln(1+\bar{t}_{I2j}-\bar{t}_{sj})+b_{Pj1}+b_{Pj2}\ln p_K+b_{Pj3}\ln p_L+(1-b_{Pj2}-b_{Pj3})\ln p_{Mj}+b_{Pj4}\ln t$$
$$+\tfrac{1}{2}b_{Pj5}(\ln p_K)^2+b_{Pj6}\ln p_K\ln p_L-(b_{Pj5}+b_{Pj6})\ln p_{Mj}+\tfrac{1}{2}b_{Pj7}(\ln p_L)^2$$
$$-(b_{Pj6}+b_{Pj7})\ln p_L\ln p_{Mj}+\tfrac{1}{2}(b_{Pj5}+2b_{Pj6}+b_{Pj7})(\ln p_{Mj})^2+b_{Pj8}\ln p_K\ln t$$
$$+b_{Pj9}\ln p_L\ln t-(b_{Pj8}+b_{Pj9})\ln p_{Mj}\ln t+\tfrac{1}{2}b_{Pj10}(\ln t)^2$$

(7) Levels of total factor productivity

$$-\ln TFP_j = b_{Pj1}+b_{Pj4}\ln t+b_{Pj8}\ln p_K\ln t+b_{Pj9}\ln p_L\ln t$$
$$-(b_{Pj8}+b_{Pj9})\ln p_{Mj}\ln t+\tfrac{1}{2}b_{Pj10}(\ln t)^2$$

(8) Prices of Export goods

$$\ln p_{EXj} = b_{EXj1}+b_{EXj2}\ln p_{Dj}+b_{EXj3}\ln\overline{exr}$$

(9) Rate of return on capital goods

$$r = p_K\frac{p_{I0}(r_0+d)}{p_I}-d,\ p_I = \prod_{i=1,..,n} p_{Oi}^{\bar{b}_{Ipi}}$$

2. Demand Block

(1) Disposable Income

$$Y_D = \left[(1-\bar{t}_{D1}-\bar{t}_{D2}-\bar{t}_{D3})\left(p_L\overline{SLT}+p_K\overline{SKT}\right)+\overline{Y}_{SOC}+\overline{TRI}_{GP}+\overline{TRI}_{RP}\right]\cdot\overline{ERR}_1$$

(2) Consumption

$$\ln\left(\frac{C_P}{pop}\right) = b_{C1}+b_{C2}\ln\left(\frac{Y_D/P_{CT}}{pop}\right)+b_{C3}\ln\left(\frac{NW(-1)/P_{CT}}{pop}\right)+b_{C4}\ln\left(\frac{P_{CT}(1+r)}{P_{CT_{-1}}}\right)$$
$$+b_{C5}hsize+b_{C6}AGE_{14}+b_{C7}AGE_{65}$$

（3）Consumers' prices

$$\ln p_{Ek} = \sum_i b_{EVik} \ln p_{Oi}$$

（4）Consumption expenditure by objects

$$a_{Ei} = a_{ik} v_i + b_{Ei5}\left[1 - \sum_j a_{jk} v_j\right] + b_{Ei7}, v_i = p_{Ei} / (VC_H)$$

$$a_{ik} = b_{Ek1} + b_{Ek2} AGE_{14} + b_{Ek3} AGE_{65} + b_{Ek4} hsize$$

$$VC_H = p_{CT} \cdot C_P - VC_N$$

$$\ln p_{CT} = \sum_i a_{Ei} \ln p_{Ci}$$

（5）Consumption expenditure by commodities

$$C_{Hi} = \sum_k b_{EVik} \cdot a_{Ek} VC_H / dif_1 / p_{Oi}$$

（6）Consumption expenditure of non-profit institutions

$$C_{Ni} = b_{CNi} \overline{VC_N} / dif_2 / p_{Oi}$$

（7）Investment and inventory

$$I_{Pi} = \bar{b}_{IPi} VI_P / dif_4 / p_{Oi}$$

$$I_{Vi} = b_{IVi} \overline{VI_V} / dif_6 / p_{Oi}$$

（8）Consumption and Investment of government

$$C_{Gi} = b_{CGi} \overline{VC_G} / dif_3 / p_{Oi}$$

$$I_{Gi} = b_{IGi} \overline{VI_G} / dif_5 / p_{Oi}$$

（9）Export Supply

$$\ln E_i = b_{EX4i} + b_{EX5i} \ln (p_{EXi} / \overline{exr}) + b_{EX6i} \ln \bar{E}_i(-1)$$

$$VET = \sum_i p_{EXi} E_i \cdot dif_7$$

（10）Total Demand

$$X_i + M_i = \sum_j x_{ij} + FD_i + E_i, m_i = M_i / (\sum_j a_{ij} X_j + FD_i)$$

$$X_i + m_i (\sum_j a_{ij} X_j + FD_i) = \sum_j a_{ij} X_j + FD_i + E_i$$

$$FD_i = C_{Pi} + C_{Gi} + C_{Oi} + I_{Pi} + I_{Vi} + I_{Gi}$$

$$\mathbf{x} = \left[\mathbf{I} - \hat{\mathbf{D}}\mathbf{A}\right]^{-1}\left[\hat{\mathbf{D}}\mathbf{f} + \mathbf{e}\right], \mathbf{x} = (X_1, .., X_n)', \mathbf{f} = (FD_1, .., FD_n)', \mathbf{e} = (E_1, .., E_n)'$$

$$\mathbf{A} = \{b_{IJij} \cdot a_{Mj} / (1 + t_{I2j} - t_{Sj}) \cdot p_{Dj} / p_{Mj}\},$$

$$\hat{\mathbf{D}} = diag(1 - a_{IM1} p_{O1} / p_{IM1}, .., 1 - a_{IMn} p_{On} / p_{IMn})$$

（11）Import Demand

$$M_i = (a_{IMi} \cdot \frac{p_{Oi}}{p_{IMi}})\left[\sum_j b_{IJij} a_{Mj} / (1 + \bar{t}_{I2j} - \bar{t}_{Sj}) \frac{p_{Dj}}{p_{Mj}} X_j + FD_i\right]$$

$$VMT = \sum_i p_{IMi} M_i \cdot dif_8$$

3. Market Equilibrium and Macro Balance

(1) Labor demand and capital demand

$$DL_j = a_{Lj}/(1+\bar{t}_{I2j}-\bar{t}_{Sj})\, p_{Dj}X_j / p_L, DL_T = (\sum_j DL_j)\cdot dif_{10}$$

$$DK_j = a_{Kj}/(1+\bar{t}_{I2j}-\bar{t}_{Sj})\, p_{Dj}X_j / p_K, DK_T = (\sum_j DK_j)\cdot dif_{9}$$

(2) Net saving of government

$$(\bar{t}_{D1}+\bar{t}_{D2}+\bar{t}_{D3})[p_L\overline{SLT}+p_K\overline{SKT}]+(\sum_i(\bar{t}_{I1i}+\bar{t}_{I1bi}+\bar{t}_{I1ei})\frac{p_{IMi}M_i}{(1+\bar{t}_{I1ai}+\bar{t}_{I1bi}+\bar{t}_{I1ei})}$$

$$+\sum_j(\bar{t}_{I2j}-\bar{t}_{Sj})\frac{p_{Dj}X_j}{(1+\bar{t}_{I2j}-\bar{t}_{Sj})})\cdot dif_{11}+\overline{TRI}_{RG}$$

$$\overline{VC}_G+\overline{DK}_G+\overline{Y}_{SOC}+\overline{TRI}_{GP}$$

$$SI_G = S_G+\overline{DEP}_G+\overline{TRC}_{PG}+\overline{TRC}_{RG}-\overline{VI}_G-\overline{VL}_G$$

(3) Net Saving of national economy

$$S_R = (VET+\overline{YL}_R+\overline{YK}_R+\overline{TRI}_{RG})\cdot err_2 - VMT$$

$$SI_R = S_R+\overline{TRC}_{RG}$$

(4) Investment Supply on private sector

$$VIPS = (YD - P_{CT}C_P+\overline{DEP}_P-\overline{TRC}_{PG}-\overline{VI}_V+\overline{VL}_G+SI_G-SI_R)\cdot err_3$$

(5) Excess supply on labor, capital, and investment market

$$ESL = SL_T - DL_T$$

$$ESK = SK_T - DK_T$$

$$ESI = VIPS - VIP$$

(6) Walras' Law

$$ESL + ESK + ESI = 0$$

Table 9-1 Services Sector in the Japanese Economy: 1993

Code	Sector	Output (¥billion)	Output (% total)	Value added (¥billion)	Value added (% total)	Employment (1,000)	Employment (% total)	Labor Productivity (average=1)
	Construction	88779	10.27	39706	9.40	6511	10.02	0.939
117	New residential construction	22492	2.60	9641	2.28	1644	2.53	0.903
118	New non-residential construction	19529	2.26	8882	2.10	1408	2.17	0.971
119	Building repair	7616	0.88	2774	0.66	450	0.69	0.949
120	Public utility construction	27293	3.16	13404	3.17	2099	3.23	0.983
121	Railroad construction	1557	0.18	678	0.16	134	0.21	0.780
122	Electric utility facilities construction	1418	0.16	641	0.15	100	0.15	0.986
123	Telecommunication facilities construction	512	0.06	225	0.05	158	0.24	0.219
124	Other civil engineering and construction	8363	0.97	3461	0.82	517	0.80	1.030
	Public utilities	21873	2.53	12155	2.88	505	0.78	3.707
125	Electricity	14361	1.66	7629	1.81	174	0.27	6.735
126	Gas	2087	0.24	1177	0.28	58	0.09	3.127
127	City water	3786	0.44	2127	0.50	124	0.19	2.645
128	Thermal energy supply	1639	0.19	1222	0.29	149	0.23	1.266
	Distribution	85357	9.88	58240	13.79	13609	20.94	0.659
129	Wholesale	53231	6.16	36368	8.61	5609	8.63	0.998
130	Retail trade	32126	3.72	21872	5.18	8000	12.31	0.421
	Financial and insurance services	28888	3.34	19405	4.60	2056	3.16	1.453
131	Financial services	19890	2.30	12726	3.01	1254	1.93	1.562
132	Insurance	8998	1.04	6678	1.58	801	1.23	1.283
	Real estate							
133	Real estate	56199	6.50	46675	11.05	762	1.17	9.430
	Transportation	34783	4.03	19720	4.67	2891	4.45	1.050
134	Railroads	6158	0.71	3078	0.73	292	0.45	1.625
135	Road passenger transport	4217	0.49	3006	0.71	586	0.90	0.790
136	Road freight transport and storage	12612	1.46	7835	1.86	1478	2.27	0.816
137	Water transport and related services	5027	0.58	2088	0.49	225	0.35	1.428
138	Air transport and related services	2972	0.34	1275	0.30	104	0.16	1.888
139	Other transport services	3797	0.44	2439	0.58	206	0.32	1.818
	Communications	13317	1.54	9605	2.27	752	1.16	1.967
140	Postal services	1775	0.21	1464	0.35	207	0.32	1.090
141	Communications	9093	1.05	7059	1.67	476	0.73	2.282
142	Broadcasting	2450	0.28	1082	0.26	69	0.11	2.418
	Other services	192450	22.27	116905	27.69	20440	31.45	0.880
143	Government	21588	2.50	14747	3.49	2068	3.18	1.098
144	Public services	23796	2.75	18107	4.29	2584	3.98	1.079
145	Education and research	16337	1.89	10603	2.51	1455	2.24	1.122
146	Non-profit organization	11170	1.29	6311	1.49	1295	1.99	0.750
147	Information and computer services	7067	0.82	4109	0.97	611	0.94	1.036
148	Medical and health services	14996	1.74	8204	1.94	1383	2.13	0.913
149	Advertising	5445	0.63	1318	0.31	172	0.26	1.183
150	Motor vehicles renting and leasing	919	0.11	650	0.15	29	0.04	3.492
151	Building maintenance service	2545	0.29	1670	0.40	473	0.73	0.543
152	Legal, financial and accounting services	1811	0.21	1145	0.27	284	0.44	0.620
153	Other business services	25513	2.95	16751	3.97	2451	3.77	1.052
154	Motion pictures	973	0.11	443	0.10	63	0.10	1.089
155	Other amusement and recreation services	15307	1.77	9964	2.36	918	1.41	1.670
156	Drinking and eating place	17995	2.08	8848	2.10	2937	4.52	0.464
157	Hotel and other lodging places	5314	0.62	2481	0.59	557	0.86	0.686
158	Barber shops and beauty shops	2100	0.24	1506	0.36	676	1.04	0.343
159	Other personal services	6833	0.79	4613	1.09	1461	2.25	0.486
160	Motor vehicles repair	6336	0.73	2377	0.56	715	1.10	0.512
161	Other repair	6406	0.74	3059	0.72	308	0.47	1.527
	Services total	521648	60.37	322411	76.36	47526	73.12	1.044

Source: Management and Coordination Agency, Input-Output Table 1993

Table 9-3 Price and TFP Differences in Japan and the U.S. (U.S=1)

Sector	Price	TFP
Agriculture	2.261	0.880
1 Cereals	6.000	0.207
12 Forestry	3.120	0.385
6 Tobacco	2.250	0.538
2 Vegetables	1.784	0.649
9 Poultry	1.855	0.686
8 Dairy farming	2.173	0.698
3 Fruits	1.524	0.806
7 Other non-edible foods	1.420	0.905
11 Agri services	1.358	0.968
4 Other edible foods	1.249	1.005
10 Other livestock	1.412	1.165
5 Crops for sugar	1.000	1.217
14 Fishery	0.986	1.326
13 Logging	1.089	2.031
Mining	1.039	1.613
15 Metal ore	3.000	0.391
17 Other non-metal ores	3.322	0.406
18 Coal mining	0.844	1.354
16 Gravel, quarry, crushed stone	0.709	1.806
19 Crude petroleum, natural gas	0.843	1.956
Food	2.069	0.944
28 Sugar	1.770	0.431
21 Animal oil and fat	2.657	0.545
29 Vegatable oil	2.230	0.652
33 Soft drinks	2.147	0.666
20 Meat and meat products	2.308	0.666
31 Other food stuffs	2.186	0.712
26 Bread	1.847	0.747
23 Sea foods	1.571	0.757
32 Liquor	2.722	0.757
25 Noodles	1.938	0.780
27 Confectionery	1.847	0.809
30 Other processed agrri. foods	1.712	0.884
22 Dairy products	1.930	0.927
24 Grain mill and flour	2.286	1.357
35 Tobacco	1.847	1.682
34 Feeds for animals	0.896	2.227
Textiles	1.224	1.153
38 Wearing apparel	1.546	0.722
36 Reeling and spinning	1.495	0.843
39 Carpets	1.261	1.000
37 Fabrics, yarn	0.885	1.551
40 Other textiles	0.547	2.152
Chemical products	1.517	1.196
52 Basic chemicals	2.341	0.705
62 Petroleum, coal products	1.987	0.712
63 Tires	1.657	0.871
80 Metal products for const.	2.091	0.672
81 Other metal products	1.742	0.740
78 Electric wires	1.230	1.084
75 Steel and steel products	1.271	1.243
77 Aluminum products	1.140	1.354
79 Other non-ferrous metals	1.180	1.403
76 Copper products	1.109	1.497
Machinery	1.288	1.253
86 Other general machinery	2.374	0.627
87 Office machinery	2.252	0.644
84 Machine tools	2.056	0.707
109 Medical instruments	1.891	0.710
100 Other electric machinery	1.843	0.799
106 Optical instruments	1.479	0.852
82 Engines and boilers	1.573	0.880
95 Rotating electric machinery	1.500	1.015
107 Watches and clocks	1.445	1.023
83 Conveyors	1.392	1.104
99 Batteries	1.337	1.123
90 Elec. computing equip.	1.245	1.125
96 Elec equip for internal combus.	1.257	1.152
97 Electric bulbs	1.342	1.163
105 Aircraft	1.045	1.164
102 Two wheel vehicles	1.079	1.209
88 Ratio and TV	1.085	1.222
94 Electron tubes	1.057	1.253
85 Textile machinery	1.263	1.256
93 Semi-conductors	1.057	1.268
108 Analytical instruments	1.056	1.277
98 Electric & electronic parts	1.166	1.297
104 Railroad cars	1.037	1.304
89 Other household electric app.	1.248	1.330
103 Ship building	1.045	1.405
101 Cars	0.755	1.712
92 Other telecommunication mach.	0.743	1.878
91 Wired communication mach.	0.743	1.880
Other manufacturing	1.766	0.933
42 Plywood	6.900	0.197
46 Foreign and Japanese paper	2.297	0.583
113 Stationnary	2.390	0.607
116 Other manufacturing	2.148	0.668
47 Coated and converted paper	2.159	0.749
49 Other paper products	1.972	0.785
74 Miscellaneous ceramic products	1.726	0.800
41 Wood chips	1.436	0.817
110 Toys and sporting goods	1.681	0.818
51 Publishing and printing	1.646	0.867
70 Concrete	1.573	0.868
48 Paper containers	1.381	1.262
43 Other wooden products	1.016	1.497
45 Pulp	0.940	1.613
50 Newspapers	1.042	1.861
Construction	2.505	0.562
121 Railroad construction	2.672	0.500
122 Electric utility facilities	2.672	0.507
120 Public utility	2.648	0.520
117 New residential construction	2.711	0.530
118 New non-residential construct.	2.354	0.588
123 Telecommunication facilities	1.913	0.625
124 Other construction	2.183	0.639
119 Building repairs	2.183	0.644
Electricity, gas, water	1.753	0.922
126 Gas	2.524	0.521
128 Thermal energy supply	1.425	0.852
125 Electricity	1.814	0.922
127 Water	1.302	1.149
Distribution	1.578	0.830
129 Wholesale	1.572	0.830
130 Retail trade	1.586	0.830
Financial services	2.404	0.803
131 Banking	2.532	0.803
132 Insurance	2.107	0.803
Real estate	1.290	1.349
133 Reat estate	1.290	1.349
Transportations and communications	2.943	0.817
136 Road freight transport	6.908	0.159
140 Postal services	1.390	0.788
137 Water transport services	1.662	0.792
142 Broadcasting	1.365	0.971
135 Road passenger transport	1.123	0.976
141 Communications	1.232	1.136
134 Railroads	1.142	1.209
139 Other transport services	1.102	1.464
138 Air transport services	0.854	1.606
Services	2.008	0.943
152 Legal and accounting serv.	4.804	0.272
153 Other business services	4.804	0.305
151 Building maintenance serv.	4.804	0.379
162 Waste and scraps	2.577	0.388
144 Public services	2.088	0.508
150 Motor vehicles leasing	2.495	0.512
157 Hotel and lodging	2.077	0.646
163 Extra household expend.	2.077	0.659
149 Advertisement	1.960	0.707
156 Restaurants	2.077	0.755
164 Unclassified	2.077	0.772

60	Paints and ink	1.920	0.904	67	Other leather products	1.588	0.907	161	Other repair	1.719	0.796
54	Agricultural chemicas	1.607	1.036	44	Furniture	1.664	0.908	159	Other personal services	2.071	0.859
61	Other chemicals	1.379	1.245	111	Records	1.478	0.928	158	Barber and beauty shops	1.938	0.895
64	Plastics, rubber products	1.171	1.248	69	Cement	1.482	0.931	154	Motion pictures	1.384	0.991
65	Footwear	1.146	1.323	71	Cement products	1.460	0.989	160	Motor vehicle repair	1.220	1.019
55	Synthetic resin	1.382	1.330	112	Musical instruments	1.478	1.026	155	Other amusement serv.	1.391	1.020
56	Synthetic fibers	1.091	1.584	114	Small personal adornments	1.404	1.026	147	Information & computer	1.190	1.054
53	Fertilizers	1.072	1.714	72	Ceramic wares	1.415	1.027	146	Non-profit organization	0.920	1.299
57	Medicaments	0.736	2.152	115	Ordance	1.000	1.135	145	Education and research	0.785	1.998
59	Cosmetics, toileteries	0.705	2.352	68	Glass and glass products	1.229	1.139	148	Medical and health serv.	0.588	2.278
58	Soap and detergents	0.609	2.504	66	Leather and fur products	1.497	1.167	**Government**		2.088	0.477
Metals		1.476	1.062	73	Carbon, graphite products	1.234	1.203	143	Government	2.088	0.477

Table 9-4 Sensitivity Analysis: 20 percent increase in TFP

	Base	20 percent increase in TFP in Communication1.通信	Transport	Construction	Finance	Insurance	Medical	Distribution
Macroeconomic Indicators (index, billion yen)								
PL/PC	1.000	0.4%	0.7%	0.4%	1.2%	0.2%	0.7%	1.8%
PC	1.000	-0.6%	-2.5%	0.0%	-0.5%	-1.0%	-1.1%	-5.7%
PI	1.000	-0.3%	-2.2%	-9.8%	-0.2%	-0.5%	-0.1%	-5.3%
VIP/PI	115184	0.3%	0.7%	12.0%	2.0%	-0.4%	-0.2%	2.2%
YD/PC	291834	0.5%	1.4%	0.3%	0.9%	0.5%	0.9%	3.4%
VCP/PC	243628	0.4%	1.4%	0.1%	0.8%	0.5%	0.8%	3.3%
GDP	424537	0.4%	1.7%	4.5%	0.8%	0.4%	0.5%	3.6%
Cosumers' surplus (equivalent variations, yen)								
Per family	0	41,495	160,168	13,435	58,065	33,835	73,453	328,233
Per capita	0	12,967	50,052	4,199	18,145	10,573	22,954	102,573
Prices of consumption goods								
Food and beverage	1.000	-0.4%	-2.5%	0.1%	-0.2%	-0.5%	-0.2%	-9.7%
Clothing	1.000	-0.4%	-2.1%	0.1%	-0.3%	-0.5%	-0.2%	-11.8%
Rent and e.g.w	1.000	-0.1%	-0.6%	-0.7%	-1.1%	-0.2%	0.0%	-1.3%
Furniture, etc	1.000	-0.4%	-2.2%	0.1%	-0.2%	-0.8%	-0.2%	-9.6%
Medical, insurance	1.000	-0.5%	-1.9%	0.2%	-0.1%	-0.6%	-9.8%	-5.5%
Tranportation	1.000	-2.6%	-8.4%	0.0%	-0.6%	-0.6%	-0.1%	-5.5%
Education, amusement	1.000	-0.7%	-1.6%	0.0%	-0.2%	-0.4%	-0.1%	-3.6%
Others	1.000	-0.4%	-2.5%	0.1%	-0.8%	-3.9%	-0.2%	-4.7%
Prices of production goods								
Agriculture	1.000	-0.2%	-2.2%	0.2%	-0.3%	-0.6%	-0.2%	-3.6%
Mining	1.000	-0.3%	-6.4%	0.0%	-0.6%	-0.6%	-0.1%	-2.8%
Food	1.000	-0.3%	-2.3%	0.1%	-0.3%	-0.5%	-0.1%	-3.9%
Textiles	1.000	-0.3%	-2.0%	0.1%	-0.5%	-0.5%	-0.1%	-4.6%
Chemicals	1.000	-0.2%	-1.5%	0.0%	-0.3%	-0.3%	-0.1%	-2.4%
Metals	1.000	-0.2%	-1.9%	0.0%	-0.3%	-0.3%	-0.1%	-3.1%
Machinery	1.000	-0.2%	-1.7%	0.0%	-0.2%	-0.4%	-0.1%	-3.6%
Other manufacturing	1.000	-0.3%	-2.3%	0.0%	-0.3%	-0.5%	-0.1%	-3.8%
Construction	1.000	-0.3%	-2.4%	-18.0%	-0.2%	-0.5%	-0.1%	-3.9%
Elec, gas, water	1.000	-0.2%	-1.2%	-0.5%	-0.4%	-0.3%	-0.1%	-1.9%
Distribution	1.000	-0.6%	-2.3%	0.2%	-0.4%	-0.6%	-0.2%	-20.8%
Financing	1.000	-0.6%	-1.5%	0.2%	-13.8%	-5.9%	-0.2%	-2.7%
Real estate	1.000	-0.1%	-0.5%	-0.7%	-1.3%	-0.1%	0.0%	-0.8%
Transport, communication	1.000	-4.1%	-16.7%	0.1%	-0.5%	-0.7%	-0.2%	-3.1%
Services	1.000	-0.6%	-1.8%	0.1%	-0.2%	-0.5%	-1.5%	-3.7%

Table 4 (continued)

Domestic production (billion yen)								
Agriculture	19522	0.6%	1.8%	0.5%	1.6%	0.0%	0.1%	-3.5%
Mining	2156	0.7%	4.4%	0.2%	2.3%	0.2%	0.0%	4.7%
Food	36953	0.6%	1.2%	0.5%	1.3%	-0.1%	0.1%	-4.8%
Textiles	14334	0.7%	2.0%	0.5%	1.9%	0.7%	0.2%	-6.2%
Chemicals	49707	0.5%	0.8%	0.5%	2.1%	0.3%	-0.8%	2.2%
Metals	52246	0.5%	2.3%	0.1%	2.4%	0.0%	-0.1%	3.3%
Machinery	132234	-0.1%	-0.4%	0.6%	1.5%	0.0%	0.0%	1.8%
Other manufacturing	50583	1.0%	2.7%	0.5%	2.4%	-0.1%	-0.1%	2.5%
Construction	89199	0.4%	1.6%	21.3%	1.7%	0.0%	0.0%	2.1%
Elec, gas, water	20454	1.1%	3.3%	0.3%	1.7%	0.6%	0.2%	5.8%
Distribution	82414	0.5%	0.7%	0.4%	1.7%	0.1%	-0.1%	10.2%
Financing	31252	1.0%	1.2%	1.2%	4.0%	3.4%	0.2%	2.4%
Real estate	50116	1.6%	5.0%	-0.6%	0.6%	2.0%	0.9%	9.5%
Transport, communication	53382	1.0%	3.9%	0.6%	2.1%	0.1%	0.1%	0.5%
Services	184798	0.5%	1.5%	0.6%	1.7%	-0.5%	0.8%	2.8%
Employment (1,000)								
Agriculture	5343	0.7%	1.1%	0.3%	0.7%	0.2%	0.3%	-4.3%
Mining	100	0.0%	-25.4%	-1.4%	-4.2%	-0.1%	0.8%	4.7%
Food	1745	0.6%	0.9%	0.2%	0.5%	0.3%	0.3%	-4.7%
Textiles	1474	0.6%	1.6%	0.3%	0.9%	0.9%	0.4%	-7.8%
Chemicals	1252	0.7%	1.6%	0.3%	1.7%	0.3%	-0.8%	1.6%
Metals	1838	0.6%	2.2%	-0.4%	1.8%	0.4%	0.2%	3.4%
Machinery	4741	-0.1%	-0.6%	0.1%	0.4%	0.4%	0.3%	0.4%
Other manufacturing	2876	0.9%	2.2%	0.2%	1.5%	0.1%	0.1%	2.2%
Construction	6502	0.2%	0.4%	-0.9%	0.4%	0.4%	0.3%	1.7%
Elec, gas, water	477	0.7%	2.4%	-1.9%	-1.1%	0.7%	0.6%	7.1%
Distribution	13508	0.6%	0.7%	0.4%	1.6%	0.3%	0.0%	-8.9%
Financing	2216	0.5%	0.9%	0.9%	-10.0%	-3.2%	0.4%	3.0%
Real estate	679	1.7%	6.0%	-0.8%	0.2%	2.4%	1.2%	11.7%
Transport, communication	3547	-2.8%	-12.7%	0.1%	0.5%	0.0%	0.4%	1.3%

Services	17464	0.0%	0.8%	0.1%	0.0%	-0.8%	-0.4%	2.2%

Source: Authors' calculation

Table 9-5 Free Trade and Deregulation

	Base	Free Trade	Deregulation	Free trade Deregulation
Macroeconomic Indicators (index, billion yen)				
PL/PC	1.000	1.6%	4.4%	6.7%
PC	1.000	-6.4%	-7.4%	-13.2%
PI	1.000	-8.0%	-11.8%	-19.0%
VIP/PI	115184	-0.3%	13.6%	15.3%
YD/PC	291834	3.6%	5.8%	9.9%
VCP/PC	243628	3.6%	5.4%	9.4%
GDP	424537	1.4%	10.0%	12.2%
Cosumers' surplus (equivalent variations, yen)				
Per family	0	334,373	435,491	898,632
Per capita	0	104,492	136,091	280,822
Prices of consumption goods				
Food and beverage	1.000	-12.1%	-6.9%	-18.3%
Clothing	1.000	-10.6%	-6.7%	-16.4%
Rent and e.g.w	1.000	-2.1%	-3.1%	-5.2%
Furniture, etc	1.000	-7.0%	-7.2%	-13.7%
Medical, insurance	1.000	-5.2%	-16.2%	-20.5%
Tranportation	1.000	-5.4%	-7.6%	-12.6%
Education, amusement	1.000	-5.0%	-5.0%	-9.8%
Others	1.000	-6.5%	-10.2%	-16.1%
Prices of production goods				
Agriculture	1.000	-13.5%	-4.9%	-18.0%
Mining	1.000	-6.4%	-13.3%	-19.5%
Food	1.000	-15.6%	-5.6%	-20.7%
Textiles	1.000	-10.4%	-5.3%	-15.3%
Chemicals	1.000	-10.4%	-4.1%	-14.3%
Metals	1.000	-8.8%	-4.8%	-13.4%
Machinery	1.000	-7.6%	-5.0%	-12.6%
Other manufacturing	1.000	-11.6%	-5.7%	-16.9%
Construction	1.000	-6.5%	-16.7%	-22.3%
Elec, gas, water	1.000	-3.4%	-6.4%	-9.6%
Distribution	1.000	-4.4%	-8.8%	-12.4%
Financing	1.000	-3.8%	-9.7%	-13.0%
Real estate	1.000	-1.2%	-2.3%	-3.7%
Transport, communication	1.000	-4.8%	-16.8%	-20.7%
Services	1.000	-5.5%	-13.2%	-18.1%
Domestic production (billion yen)				
Agriculture	19522	-2.0%	3.8%	3.0%
Mining	2156	-2.8%	15.2%	14.4%
Food	36953	0.0%	2.2%	3.7%
Textiles	14334	-0.5%	5.2%	6.5%
Chemicals	49707	-0.2%	7.0%	8.3%
Metals	52246	2.7%	10.7%	15.7%
Machinery	132234	2.4%	5.4%	9.3%
Other manufacturing	50583	1.8%	9.8%	13.5%
Construction	89199	1.5%	20.3%	23.6%
Elec, gas, water	20454	7.2%	12.5%	21.4%
Distribution	82414	-1.7%	6.5%	5.6%
Financing	31252	4.5%	8.7%	15.1%
Real estate	50116	10.7%	12.1%	22.9%
Transport, communication	53382	3.3%	10.3%	15.0%
Services	184798	4.7%	9.9%	16.1%
Employment (1,000)				
Agriculture	5343	-13.2%	1.4%	-11.7%
Mining	100	-11.1%	-47.8%	-62.0%
Food	1745	-8.9%	0.4%	-8.4%
Textiles	1474	-6.8%	2.8%	-3.1%
Chemicals	1252	-0.8%	6.6%	6.8%
Metals	1838	-3.5%	9.0%	6.0%
Machinery	4741	-4.2%	0.8%	-3.9%
Other manufacturing	2876	-4.2%	7.2%	3.4%
Construction	6502	-1.5%	1.6%	-0.1%
Elec, gas, water	477	5.8%	0.3%	4.7%
Distribution	13508	-2.0%	2.6%	1.2%
Financing	2216	4.5%	-0.6%	4.5%
Real estate	679	13.5%	13.8%	27.2%
Transport, communication	3547	2.7%	-8.9%	-6.2%
Services	17464	2.4%	-5.4%	-3.4%

Source: Authors' calculation