

# The Impact Analysis of Regional Finance Policies-The Wine Industry in Hokkaido Japan

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**Abstract**—We imported wines in Europe, Australia, America, etc. is the mainstream in Japan. The increasing of the total sales of winery in Hokkaido (Japan) is also expanding into the service industry to produce wine to use 100% domestic grapes, using a Hokkaido Input-Output Table in 33 Sections, that lead to revitalization of local communities. Hokkaido Japan is an area with the same GDP as the Czech Republic, Portugal, and New Zealand. (1) Assume that the existing quantity of wine production increases to the level of the red wine consumption boom in Japan (2000); Hokkaido GDP will increase by about 0.01% (-1.9% in 2009). (2) Assume that the production of high-value-added wine is increased; Hokkaido GDP will be raised more efficiently than in case (1). (3) Assume that a wine maker may build and serve a hotel and a restaurant by the investment fund, Hokkaido GDP will be raised more efficiently than in case (2). We need increased wine production and an increase in high-value-added wine production. A regional improvement policy is important for building a useful infrastructure. That is, an improved infrastructure for physical distribution and finance, and an expansion in industries related to the wine industry.

**Index Terms**—ripple effects, input-output, sustainable regional economy, regional investment

## I. INTRODUCTION

The wine drunk in Japan is mainly imported. The quantity in the 2008 fiscal year was 163,000 kl. Many wines are from Europe, the United States, Australia, New Zealand, Chile, Argentina, South Africa, etc. However, wine is also manufactured in Japan. Japan's wine manufacture in the 2008 fiscal year was 97,639kl; ranked by prefecture that was Yamanashi Prefecture 22,979kl, Kanagawa 2,2691kl, Tochigi 10,228kl, Okayama 4,736kl, Nagano 3,443kl, and Hokkaido 2,356kl (figures for fiscal year 2009.)

Koshu wine from Yamanashi Prefecture near Tokyo, where the wine industry is 88 years old, is of the top quality and produced in the largest quantity. We do not consider organic wine [1].

Hakodate Wine (Hakodate Wine Company) is 38 years old and it is the oldest in Hokkaido. The quality of most Hokkaido wine is table wine with a short aging period, except for that from two or three wineries accepted in the world wine market. The present industry has few excellent wines excellent which can become valuable vintages of added value when aged for a sufficient period. Much was expected of Hokkaido as a winery location because of its soil and climate, which are relatively suitable for the production of grapes, and the few companies operating 20 years ago have increased to 17 companies in recent years.

The present state of the industry is such that the quantity of production and volume of sales are largely in table wine, with a cheap unit price typically around \$10 (1US\$=100 Yen).

At first, we have to consider a suitable financial structure for the wine manufacturing companies to produce a high added value product line. Moreover, we are taking into consideration the deviation of the ripple effect by the industrial structure of the area, where multipliers are 0.57 of agricultural output, 0.52 of the food section, 0.89 of the engineering works, construction and the financial service section, and 1.02 of public service, etc. This industry becomes 0.57 with low influencing magnification. It is necessary to consider the measures which can contribute to the regional economy.

The simulation of an economic ripple effect and the employment effect was carried out for the ten following policies using a Hokkaido Input-Output Table in 33 Sections [2]-[3]. Next, various inherent problems are specified, and an efficient policy and conditions are proposed.

## II. POLICIES

We consider the following six policies.

### A. Policy 1

Most wine from Hokkaido is dessert wine with short maturing periods, and the unit price is in the order of \$10, and its selling price is also low. Then, the home sales of the wine matured for one year are priced at \$25; this makes up 10% of the present quantity of wine production.

### B. Policy 2

There was also a red wine consumption boom and the quantity of wine production in Hokkaido was set at 4,965 kl in fiscal year 2000. This boom was temporary and production levels have not reached that level since 2000. The wine maker who produced wine in those days is still continuing production. Then, the case of (Policy 1) when the quantity of production is raised to the level of fiscal year 2000 is estimated.

### C. Policy 3

The production increase portion in (Policy 2) is considered to be as follows. The example of the Koshu wine, which was the most successful in Japan, is imitated, and the manufacture percentage of a price range carries out a production increase plan similarly.

### D. Policy 4: Self-Financing Funds

It is assumed that wine manufacturing companies turn 30% of their material cost and 30% of their personnel expenses to soil improvement expenses independently on the assumption in (Policy 3). They do not use financial institutions and finance service agencies by the revised money lending business control and regulation law [5]. This should improve the soil and should produce a quality grape suitable for wine. Thus, Policy 4 is preparing conditions so that good wine can be manufactured.

### E. Policy 5: Subsidy through Financial Institutions

In (Policy 3), the government assists through financial institutions by making 30% of material costs into soil improvement expenses. The financial institution examines whether a wine company and a winery can receive a subsidy and contracts the enforcement supervisor in a subsidiary enterprise. It can receive 30% of the amount of the subsidy from the government as a commission. The consultancy firm specified by the financial institution takes over the enforcement supervisor's business, and 10% of the sales of the financial institution serve as an acceptance commission. We also analyzed the case of financing of bank loans (Policy 51) and investment funds (Policy 52).

### F. Policy 6: Subsidy through Financial Institutions

In (Policy 3), the government performs a low-interest loan backed by the government and credit guarantee corporations to anticipate sales proceeds through the financial institution, so that a wine maker may build and serve a hotel and a restaurant. Loan conditions will be a 4% interest rate for a payment period of 20 years through the interest grace period for five years after the loan. The

government makes an interest subsidy of 4% of the rate of interest. Moreover, the amount financed when it defaults is secured. The consultancy firm specified by the financial institution performs the supervisor about enforcement. Consultancy fees pay 30% of amounts financed from an amount financed. We also analyzed the case of financing of bank loans (Policy 61) and investment funds (Policy 62).

## III. METHOD OF FIXING AMOUNT OF THE FINAL DEMAND

The analysis tool here is the "Hokkaido input-output table in 2005 fiscal year" of the Hokkaido Development Bureau [2] [3]. The amount of the final demand is derived by using the numerical value of (1) the data the public institution has released mainly; (2) the questionnaire survey of two major companies, Hokkaido Wine and Hakodate Wine, and (3) the framework from Iida [4] was applied.

The quantity of wine production in Hokkaido in the 2009 fiscal year is 2,356 kl. When the average unit price is assumed to be \$10 per 750 ml, the gross-sales estimation value is  $3,141,333 \times \$10 = \$31,413,330$ .

### A. Policy 1

Wine is aged for one year and sold for \$25. If it is aged one year, costs will go up by \$10. The composition of the cost per wine bottle is assumed to be 5% distribution margin, 30% raw material costs, 50% labor expenses, and 15% profit margin. Therefore, the \$10 wine per bottle has a raw material cost of \$3, labor expenses of \$5, a profit margin of \$1.5, and a distribution margin of \$0.5. The increment of the gross sales is assumed by putting 10% of the gross sales to age for one year. Therefore,  $314,133 \text{ wine bottles} \times \$15 = \$47.12 \text{ million sales increase}$ . We estimate this by supplying the following numerical values. The proportional division of increased final demand consists of a raw material cost of  $\$4.712 \text{ million} \times 0.3 = \$1.4136 \text{ million}$  in crop farming sector, a labor cost  $\times 0.5 = \$2.356 \text{ million}$  in the other food section, a profit margin  $\times 0.15 = \$0.7068 \text{ million}$  in the business sector, and a distribution margin  $\times 0.05 = \$0.2356 \text{ million}$  in the transportation section.

Economic Effects (amount of gross-value-added induced) is \$2.76million, Multiplier (the influencing magnification) is 0.59, and Employment Effects (created new jobs) is 20 persons.

### B. Policy 2

In the red wine consumption boom in the 2000 fiscal year, the quantity of wine production in Hokkaido was set to 4,965 kl; about twice that of the 2009 fiscal year. This boom was temporary and the industry has not reached these levels of production since then. It is assumed that 10% of the wine produced in the 2000 fiscal year was \$25 wine. The wine maker who produced wine in those days is still continuing production.

Economic Effects (amount of gross-value-added induced) is \$21.39 million, Multiplier (the influencing magnification) is 0.59, and Employment Effects (created new jobs) is 155 persons.

### C. Policy 3

The production increase portion in (Policy 2) is considered as follows. The example of Kosshu wine, which was the most successful in Japan, is imitated, and the manufacture percentage of the price range carries out a production increase plan in a similar way. Concretely, '\$10' is 71.0%, '\$20' is 14.3% and from '\$30' to '\$40' is 10.2%, above '\$50' is 4.5%.

Therefore, we assume as follows:

'\$10' is 71.0%, '\$20' is 14.3% and from '\$30' to '\$40' is 10.2%, above '\$50' is 4.5%. 71.0%, in '\$20', 14.3%, '\$40' assumes that it is 10.2%, and '\$50' assumes the wine unit price and percentage of a production increase portion to be 4.5%.

Economic Effects (amount of gross-value-added induced) are \$33.18 million, Multiplier (the influencing magnification) is 0.59, and Employment Effects (created new jobs) are 241 persons.

### D. Policy 4: Self-Financing Funds

It is assumed that the wine manufacturing company turns 30% of the material cost and 30% of personnel expenses to soil improvement expenses independently on the assumption in (Policy 3). This should improve soil and should harvest a quality grape suitable for wine brewing. Thus, it is preparing conditions so that good wine can be manufactured.

Economic Effects (amount of gross-value-added induced) are \$37.99 million, Multiplier (the influencing magnification) is 0.67, and Employment Effects (created new jobs) is 293 persons.

### E. Policy 5: Subsidy through Financial Institutions

In (Policy 3), the government assists through a financial institution by making 30% of material costs into soil improvement expenses. The financial institution examines whether a wine company and a winery can receive a subsidy and contracts the enforcement supervisor of a subsidiary enterprise. It can receive 30% of the amount of the subsidy from the government as a commission. The consultancy firm specified by the financial institution takes over the enforcement supervisor's business, and 10% of the sales of the financial institution serve as an acceptance commission.

Economic Effects (amount of gross-value-added induced) are \$46.77 million, Multiplier (the influencing magnification) is 0.65, and Employment Effects (created new jobs) are 353 persons.

(Policy 51: Bank Loans)

The wine manufacturing company will borrow from financial institutions 51,000 ten thousand yen soil improvement costs for 30% of raw material costs. That the debt amounts to around soil improvement costs always is characterized by bank loans and nonbank loans [5]-[6].

10 years repayment period 4% annual interest rate, if you borrowed \$5.1 million in the annuity.

It will pay \$62,878.38 a year repayments. This is to put pressure on profits, than in the (policy 5), lower \$ 62,878.38 per year interest payments profit.

I ignore this time for the payment of each year thereafter. Simulation of the economic effect is because the measure based on first impressions.

Economic Effects (amount of gross-value-added induced) are \$43.9 million, Multiplier (the influencing magnification) is 0.65, and Employment Effects (created new jobs) are 301 persons.

(Policy 52: Investment Funds)

Total of one year of 1.05% management fee \$5.1 million funding, a 5.5% handling charge to be paid to the silent partnership to rise at the same time to the difference in funding [7], go around to \$283.05 million payment total. This is the sales of financial services.

Investment funds recovery is performed after the completion of the project. By contract, the total asset of the project is distributed to investors regardless of the profit. The total asset is the increase in total sales amount by soil improvement.

Economic Effects (amount of gross-value-added induced) are \$47.15 million, Multiplier (the influencing magnification) is 0.69, and Employment Effects (created new jobs) are 350 persons.

### F. Policy 6: Subsidy through Financial Institutions

In (Policy 3), the government performs a low-interest loan backed by government and credit guarantee corporations to anticipate sale proceeds through a financial institution, in order that a wine maker may build and serve a hotel and a restaurant. Loan conditions will be 4% interest rates for a payment period of 20 years through the interest grace period for five years after the loan. The government does the interest subsidy of 4% of the rate of interest. Moreover, the amount financed when it defaults is secured. The consultancy firm specified by the financial institution performs the supervisor enforcement role. Consultancy fees are 30% of the amounts financed.

We assume that the contribution is 20% for the construction costs of the hotel and the restaurant, 20% personnel expenses, 50% service industry, 6% finance, and 3% unknown classification (consultancy), and 1% in profits.

Economic Effects (amount of gross-value-added induced) are \$109.79 million, Multiplier (the influencing magnification) is 0.72, and Employment Effects (created new jobs) are 1,086 persons.

(Policy 61: Bank Loans)

To borrowing from financial institutions the soil improvement costs for 30% of raw material costs.

In order to service the wine maker to build a hotel and restaurant, through financial institutions (banks and nonbanks) [5]-[6], sales amount until the loan system. Repayment period is 20 years and 4% interest rate per year.

Winemakers assumed to be entrusted the design of the hotel and restaurant consultant company, to pay 20% of the total cost.

Assume that among institutional loan department, that there is a contribution of 20% construction cost of hotel

and restaurant, 20% labor costs, 50% service industry, finance 6%, services (consultants) 3%, 1% profit.

20 years repayment period 4% annual interest rate, if you borrow \$87 million and it will pay\$ 6,253,716.96 a year in principal and interest payments equal. This is to put pressure on profits, than in the (policy 6), lower \$ 6,253,716.96 per year interest payments profit. Similar to the (policy 52), I will be ignored for payments every year thereafter.

Economic Effects (amount of gross-value-added induced) are \$111.07 million, Multiplier (the influencing magnification) is 0.73, and Employment Effects (created new jobs) are 1,062 persons.

(Policy 62: Investment Funds)

Investment funding is \$8,700 million. Handling charge to be paid to anonymous union 5.5 percent, management fee is 1.05% [7], total \$4,828,500 of these turn to payment of one year. This is added to the sales of financial services. Similar to the (policy 52), investment funds are distributed to investors after the completion of the project.

Economic Effects (amount of gross-value-added induced) are \$114.57 million, Multiplier (the influencing magnification) is 0.73, and Employment Effects (created new jobs) are 1,103 persons.

#### IV. CONCLUDING AND REMARKS

We need increased wine production and an increase in high-value-added wine. A regional improvement policy is important for building a useful infrastructure. That is, an improved infrastructure for physical distribution and finance, and an expansion in industries related to the wine industry (Fig. 1).

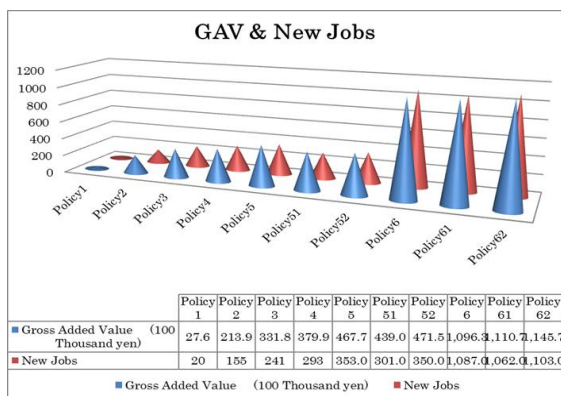


Figure 1. GAV & New Jobs

- (1) (Policy 1 - Policy 4). A simple wine production increase measure DOES NOT have efficient influencing magnification. The reason is the industrial structure peculiar to Hokkaido, which consists of low multipliers of the agricultural cultivation section 0.57.
- (2) (Policy 5, 51, 52). Although the training measure of the sixth industry is important, even if each wine company and a winery put a restaurant and a hotel side by side, influencing magnification DOES NOT become so high.

- (3) (Policy 6, 61, 62). A MORE EFFECTIVE result is obtained when both the government sector and the private sector finance the new plan.
- (4) (3) is MORE LIKELY when funds go via the public business, public service, and banking sector which is industrial structure with high influencing magnification peculiar to Hokkaido. The reason is the high multipliers of above sectors.
- (5) It is VERY IMPORTANT that the measure to which industrial structure is changed so that influencing magnifications, such as an agricultural sector and a food-processing sector, may increase.

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