SOME CAUSES OF INFLATION IN KOREA

THESIS

Presented to the Graduate Council of the
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Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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The purpose of this study is to find causes of inflation in Korea. We hypothesized that inflation in Korea was a "mixed" inflation generated by not only monetary factors but also nonmonetary factors. The data was obtained mainly from *International Finance Statistics* (IMF) and *Monthly Bulletin* (The Bank of Korea).

The first chapter introduces the Korean economy. Chapter two surveyed the effects of import prices, wages, and money supply in inflationary process. The third chapter studied some theoretical backgrounds of inflation. Chapter four analyzed the results of statistical tests. Finally, chapter five consisted of summary and policy implications.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>iv</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF ILLUSTRATIONS</td>
<td>v</td>
</tr>
</tbody>
</table>

## Chapter

I. OUTLAY OF KOREAN ECONOMY

- Introduction
- Rapid Economic Growth
- Conclusion

II. INFLATION IN KOREA

- The Effects of Import Prices
- The Effects of Wages
- The Effects of Money Growth

III. SURVEY OF LITERATURE

- Type of Inflation by Causes
- Monetarist and Structuralist Theoretical Formulation

IV. ANALYSIS OF EMPIRICAL RESULTS

- Test with Annual Time Series Data
- Comparison with Other Countries
- The Limitation of Analysis
- Conclusion

V. CONCLUSIONS

- Summary
- Policy Implications

APPENDIX

- 52

BIBLIOGRAPHY

- 59
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Total Population and Annual Growth Rate</td>
<td>3</td>
</tr>
<tr>
<td>II. Achievement of Five Year Development Plan</td>
<td>6</td>
</tr>
<tr>
<td>III. Annual Percentage Change of Income, Price Indexes, Money, and Wages</td>
<td>10</td>
</tr>
<tr>
<td>IV. Weight of Major Item in Korea WPI and CPI(%)</td>
<td>12</td>
</tr>
<tr>
<td>V. The Structure of Total Cost for Products</td>
<td>16</td>
</tr>
<tr>
<td>VI. Price Indexes and Interest Rate in 1966-1983</td>
<td>20</td>
</tr>
<tr>
<td>VII. Money and Inflation in Major Industrial Nations(IV/1975-IV/1978)</td>
<td>42</td>
</tr>
<tr>
<td>VIII. Money and Inflation in Seven Developing Countries</td>
<td>43</td>
</tr>
</tbody>
</table>
### LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Industrial Structure (1961-1983)</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>The Annual Percentage Change of Import Price Index and CPI (1966-1983)</td>
<td>14</td>
</tr>
<tr>
<td>4.</td>
<td>Effect of Transitory Nonmonetary Shock on the Trend Rate of Inflation</td>
<td>29</td>
</tr>
</tbody>
</table>
CHAPTER I

OUTLAY OF KOREAN ECONOMY

Introduction

Korea\(^1\) is relatively small and densely populated. Most of the country's total land area of about 99,000 square kilometers is mountainous. Only twenty-three per cent of the land is cultivated.\(^2\)

Korea is one of the world's most strategic areas owing to its geographical location. Bordered by Russian Siberia on the north, Mancuria and China to the west, and Japan 120 miles by water to the east, it has been both a bridge and a buffer between these powerful neighbors.

Korea's foreign economic relations have been subject to pressure from or direct control by other nations. Japan occupied Korea from 1910 to 1945 not only because of Korea's strategic position but also because of its importance as a source of essential raw materials. Korea

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\(^1\)Hereafter, South Korea was simplified as Korea in this thesis.

had no sovereignty while under Japanese control, and was therefore unable to establish long-range policies or to take other measures essential for any nation to develop trade and industry for the welfare of its people. Since the liberation of Korea from the thirty-six years of Japanese rule at the end of World War II, the United States played an important role in shaping the development pattern of the Korean economy. First of all, massive economic assistance from the United States was the major source of foreign exchange required to maintain the stability and order of the Korean economy. Subsequent to the Korean war of 1950-1953, the postwar reconstruction program was carried out mainly with U. S. assistance. Thus, heavy reliance on U. S. assistance was the major characteristic of the Korean economy prior to the rapid growth period of the 1960s.  

Two hundred minerals and ores are known to exist in Korea but their value lies more in their variety than in quantity. Self-supporting minerals are very limited. The principal mineral, anthrasite coal, is available in great quantity but is poor in quality and unsuitable for cooking.

The pressure of population on these limited resources

---

are intense. Korea's population density of 403 persons per square kilometer of the land is among the world's highest. Rising levels of education and income and a strong effort to disseminate family planning services brought down the rate of population growth from about 3 per cent a year in 1963 to 1.5 per cent in 1983.

TABLE I

TOTAL POPULATION AND ANNUAL GROWTH RATE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>27.2</td>
<td>30.1</td>
<td>32.9</td>
<td>35.3</td>
<td>37.6</td>
<td>39.9</td>
</tr>
<tr>
<td>(millions of persons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual growth rate of</td>
<td>2.9</td>
<td>2.38</td>
<td>2.22</td>
<td>1.76</td>
<td>1.62</td>
<td>1.53</td>
</tr>
<tr>
<td>population(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Rapid Economic Growth

In 1961, Korea was one of the poorest developing countries, with heavy dependence on agriculture and a weak balance of payments financed almost entirely by

foreign grant. By 1976 it had become a semi-industrial, middle income nation with a strong external payment position in the late 1970s.

Above all, industrial structure was changed in this period. In 1961 Korea remained a backward, rural economy, with the primary sector, consisting of agriculture, forestry, and fishing, accounting for about 40 per cent of the GNP, and the manufacturing sector for only about 13 per cent.

With Korea's small domestic market, it was clear that full employment of the vast labor force could not be attained through development of domestic market-oriented industries. An export-oriented industrialization strategy was therefore adopted which took advantage of foreign resources and markets as well as the abundant labor force.5

As a result, the volume of exports has increased at an annual rate of 34.6 per cent since 1961. This in turn caused the value-added in the manufacturing sector to grow, and the value-added in manufacturing rose from 15 per cent of the GNP in 1961 to 30 per cent in 1982. Social overhead and other services rose from 44.6 per cent in 1961 to 53.3 per cent in 1982, reflecting the continuous, large investment required to support rapid industrialization (Fig. 1).

5Parvez Hasan and D. C. Rao, Korea (Baltimore, 1979), pp. 16-20.
During the past Five-Year Development Plans, Korean economy has achieved remarkable growth and a significant change in the standard of living as well as industrial structure.

During the 1962-1981 period, Korea's economy grew at an average growth rate of about 10 per cent a year, accelerating from 7.8 per cent in 1962-1966, 8.8 per cent...
**TABLE II**

**ACHIEVEMENT OF FIVE YEAR DEVELOPMENT PLAN**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of GNP(%)</td>
<td>7.8</td>
<td>8.8</td>
<td>11.5</td>
<td>5.8</td>
</tr>
<tr>
<td>Growth rate of export(%)</td>
<td>43.7</td>
<td>35.2</td>
<td>46.2</td>
<td>19.9</td>
</tr>
<tr>
<td>Investment ratio of GNP(%)</td>
<td>16.6</td>
<td>26.3</td>
<td>27.0</td>
<td>29.6</td>
</tr>
<tr>
<td>Domestic saving ratio(%)</td>
<td>(6.9)</td>
<td>(14.8)</td>
<td>(17.0)</td>
<td>(25.6)</td>
</tr>
<tr>
<td>Foreign saving ratio(%)</td>
<td>(8.7)</td>
<td>(10.5)</td>
<td>(11.8)</td>
<td>(1.3)</td>
</tr>
<tr>
<td>Statistical discrepancy</td>
<td>1.0</td>
<td>1.0</td>
<td>-1.8</td>
<td>2.7</td>
</tr>
</tbody>
</table>

in 1967-1971, 11.5 per cent in 1972-1976 to 5.8 per cent in 1977-1981, the period of Korea's fourth plan. Per capita income in current price rose from less than $100 in 1961 to about $1,735 in 1982.\(^6\)

Investment and saving ratio was changed largely in this period. Investment ratio rose from 16.6 per cent in 1962-1966 to 29.6 per cent in 1977-1981. The degree of depending on foreign savings was reduced dramatically in this period. As dependence on foreign savings declines due to increased self-reliance in investment financing, an important factor contributing to past balance of payments deficits will be eliminated (TABLE II).

This rapid growth rate of GNP was caused mainly by export. In spite of two oil-shocks in 1973 and 1979, an average annual growth rate of export was 36.25 per cent in 1962-1981 (TABLE II).

Conclusion

The Korean economy has undergone a rapid and dramatic structure change with export orientation of labor intensive manufactures. Political stability, strong leadership, and a firm commitment to development were the prerequisites for

\(^6\)All dollar figures in this thesis are U. S. dollars.
economic advance. Since 1962, the Korean government has stabilized under the administration of President Park, who was re-elected in 1967 and 1971.

Since 1962, economic growth has been the most important issue in Korean economic policy. In recent years, the Korean economy was faced with a new problem with rapid economic growth accompanied with price instability. In economic theory, inflation is a natural consequence of economic growth. During the period of four Five-Year Development Plans, two main results were produced which were worsened inflation and widened income distribution.

In the growth theory of Kardor's model:

- a slow and steady rate of inflation provides a most powerful aid to the attainment of a steady rate of economic progress... the money rate of profit depends on the rate of inflation and inflation is important for maintaining a high level of investment.

Korean economy should solve the problem of "growth and stability." The growth target for Korean economy will be set at a relatively modest level in the future and economic plans will be aimed at harmonizing economic growth and price stability.

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CHAPTER II

INFLATION IN KOREA

Korea is a small open economy with a per capita income in 1983 of about $2,000. During the period of the last two decades (1962-1983), the Korean economy has achieved a rapid growth rate of GNP and exports. But price increases have been persistent since 1945 (Korea's liberation from Japan), except for a short period of price stability in 1959. An average annual rate of inflation (measured in terms of the consumer price index) was about 14.4 per cent during the period 1966 to 1983. This experience of the Korean economy, like similar developing countries, was related to higher energy prices. During the first and second oil shocks in 1973 and 1979, the annual rate of wholesale price index rose to 37.2% in 1974 and 38.9% in 1980 (TABLE III).

Inflation is defined as:

By inflation we mean a time generally rising prices for goods and factors of production—rising prices for bread, car, haircuts; rising wages, rents, etc.1

<table>
<thead>
<tr>
<th>Year</th>
<th>Real income</th>
<th>WPI</th>
<th>CPI</th>
<th>GNP deflator</th>
<th>Import prices</th>
<th>Money* supply</th>
<th>Nominal** wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>12.2</td>
<td>9.0</td>
<td>11.7</td>
<td>14.5</td>
<td>2.2</td>
<td>29.7</td>
<td>17.5</td>
</tr>
<tr>
<td>1967</td>
<td>5.9</td>
<td>6.4</td>
<td>11.1</td>
<td>15.6</td>
<td>1.7</td>
<td>44.5</td>
<td>22.1</td>
</tr>
<tr>
<td>1968</td>
<td>11.3</td>
<td>8.1</td>
<td>10.6</td>
<td>16.1</td>
<td>-1.1</td>
<td>44.4</td>
<td>26.6</td>
</tr>
<tr>
<td>1969</td>
<td>13.8</td>
<td>12.1</td>
<td>12.5</td>
<td>14.8</td>
<td>4.2</td>
<td>41.8</td>
<td>23.5</td>
</tr>
<tr>
<td>1970</td>
<td>8.8</td>
<td>11.4</td>
<td>16.0</td>
<td>15.6</td>
<td>7.9</td>
<td>22.1</td>
<td>28.9</td>
</tr>
<tr>
<td>1971</td>
<td>4.4</td>
<td>12.0</td>
<td>13.5</td>
<td>8.8</td>
<td>7.3</td>
<td>16.4</td>
<td>19.3</td>
</tr>
<tr>
<td>1972</td>
<td>11.9</td>
<td>8.9</td>
<td>11.7</td>
<td>19.2</td>
<td>8.2</td>
<td>45.1</td>
<td>15.9</td>
</tr>
<tr>
<td>1973</td>
<td>15.3</td>
<td>4.7</td>
<td>3.2</td>
<td>13.2</td>
<td>31.3</td>
<td>40.6</td>
<td>10.7</td>
</tr>
<tr>
<td>1974</td>
<td>8.3</td>
<td>37.2</td>
<td>24.3</td>
<td>29.6</td>
<td>43.8</td>
<td>29.5</td>
<td>35.7</td>
</tr>
<tr>
<td>1975</td>
<td>8.1</td>
<td>26.6</td>
<td>25.3</td>
<td>24.7</td>
<td>-4.7</td>
<td>25.0</td>
<td>27.1</td>
</tr>
<tr>
<td>1976</td>
<td>13.9</td>
<td>12.1</td>
<td>15.3</td>
<td>17.7</td>
<td>3.0</td>
<td>30.7</td>
<td>34.7</td>
</tr>
<tr>
<td>1977</td>
<td>10.1</td>
<td>9.0</td>
<td>10.1</td>
<td>16.3</td>
<td>0.9</td>
<td>40.7</td>
<td>33.8</td>
</tr>
<tr>
<td>1978</td>
<td>11.3</td>
<td>11.7</td>
<td>14.4</td>
<td>20.6</td>
<td>4.3</td>
<td>24.9</td>
<td>34.4</td>
</tr>
<tr>
<td>1979</td>
<td>7.4</td>
<td>18.8</td>
<td>18.3</td>
<td>19.3</td>
<td>26.7</td>
<td>20.7</td>
<td>28.6</td>
</tr>
<tr>
<td>1980</td>
<td>-6.2</td>
<td>38.9</td>
<td>28.7</td>
<td>27.7</td>
<td>27.5</td>
<td>16.2</td>
<td>22.7</td>
</tr>
<tr>
<td>1981</td>
<td>6.4</td>
<td>20.4</td>
<td>21.3</td>
<td>16.1</td>
<td>18.2</td>
<td>2.2</td>
<td>20.0</td>
</tr>
<tr>
<td>1982</td>
<td>5.3</td>
<td>4.6</td>
<td>7.3</td>
<td>8.1</td>
<td>-0.6</td>
<td>49.0</td>
<td>14.9</td>
</tr>
<tr>
<td>1983</td>
<td>11.9</td>
<td>0.2</td>
<td>3.4</td>
<td>2.8</td>
<td>1.1</td>
<td>17.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Average: 8.9  14.0  14.4  16.7  10.1  30.0  23.8

*Currency plus demand deposit (M1)  **Monthly earnings
Source: IMF, International Finance Statistics,
The Bank of Korea, Economic Statistic Yearbook, 1978,
Many definition of inflation have some different descriptions, but a general conception of inflation is a persistent increase of the general level of prices. Which measurement of inflation is the best for a description of inflation? In most countries, the choice of a price index to represent the general price level in measurement of inflation is quite wide. In the case of Korea, the main possibilities are as follows:

(a) the wholesale price index (WPI);
(b) the consumer price index (CPI);
(c) G.N.P. deflator;

In this study, WPI, CPI and GNP deflator will be used together for measurement of general price level in Korea. According to International Finance Statistics, WPI and CPI in Korea are defined as follows:

WPI: Data refer to the average price level of all types of commodities brought and sold in domestic primary markets. The index includes imported goods.
CPI: Data refer to the all cities consumer price index, 349 items. The weights and items selected were derived from a family expenditure survey conducted in 1980 in nine cities, including Seoul.2

GNP deflator can be obtained by dividing the current price of GNP by the real GNP. (TABLE IV) shows the weight of major goods and services covered in Korea's wholesale price index and consumer price index.

### TABLE IV

**WEIGHT OF MAJOR ITEM IN KOREA WPI AND CPI(%)**

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>WPI</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture product</td>
<td>15.5</td>
<td>36.8</td>
</tr>
<tr>
<td>Final consumer goods</td>
<td>37.9</td>
<td>37.7</td>
</tr>
<tr>
<td>Final capital goods</td>
<td>5.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Intermediate goods</td>
<td>40.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Service</td>
<td>0.0</td>
<td>25.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

*The weights cover all commodities supplied to domestic primary markets in 1980.

As is shown, there is a big difference in coverage items and their weight between WPI and CPI. One difference is about intermediate goods and service. WPI is seen to compromise no service items, while they are represented with relatively heavy weight in CPI. We know that intermediate goods are input of business firms and services are demanded mostly by consumers. These facts enable us...
to believe that WPI is more closely related to costs of firms and CPI to the movements of demand on the part of the consumer.

With these comprehensions of WPI and CPI, we will analyze causes of inflation in Korea.

The Effects of Import Prices

In Korea, the majority of low materials depends on import from aboard (crude petroleum, wood, mineral products, rubber, etc.). Total import bill was 37.8 per cent of the GNP in 1983. Coal is Korea's only heating and cooking fuel. Korea's import bill for petroleum was 21.3 per cent for total import bill in 1983. Energy prices rose sharply when the first and second oil shocks occurred in 1973 and 1979. The increases of oil prices directly effects related products of petroleum. This external stimulus through import to the domestic price level was relatively larger than any other developing countries. Oil shock means that import prices are suddenly increased. The increases of import price has affected the domestic price level.

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Fig. 2--The annual percentage change of import price index and CPI (1966-1983)

To illustrate how the increase of import prices has affected the consumer price index, (fig. 2) shows the annual growth rate of import price index and that of CPI in 1966-1983. The rapid increases in the import price index in 1973-1974 and again in 1979-1980 are clearly noticeable in Fig. 2. The consumer price index also had two peaks in the same periods. From 1966 through 1972, the import price showed little change. That means that the CPI was very stable in that period. The inflation rate has gone through a remarkable decline during the past two years because of the decrease of import prices. This type of inflation was attributed to foreign influences and is called "Imported inflation."^4

The Effects of Wages

If the rate of increase of real wage is greater than that of labor productivity, it will be a cause of rising price level. From 1966 to 1983, an average annual rate of nominal wage was 23.8 per cent. CPI rose at an annual rate of 14.4 per cent in the same period. At the same time, an annual rate of labor productivity was only 4.15 per cent.\(^5\) It means that inflation was caused by the


increase of wages to some degree during 1966-1983.

But one thing we should consider is that the wage cost is a relatively small part of the total cost for products in Korea. (TABLE V) shows us the structure of total cost for products.

**TABLE V**

THE STRUCTURE OF TOTAL COST FOR PRODUCTS

<table>
<thead>
<tr>
<th>Item</th>
<th>1970</th>
<th>1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1 Raw material and cost of capital</td>
<td>45.7</td>
<td>53.4</td>
</tr>
<tr>
<td>a. Wage</td>
<td>(18.9)</td>
<td>(16.5)</td>
</tr>
<tr>
<td>b. Tax</td>
<td>(4.2)</td>
<td>(2.3)</td>
</tr>
<tr>
<td>c. Depreciation cost</td>
<td>(2.8)</td>
<td>(3.5)</td>
</tr>
<tr>
<td>d. Profit, interest, rent, etc.</td>
<td>(28.4)</td>
<td>(24.3)</td>
</tr>
<tr>
<td>2 Value added (a+b+c+d)</td>
<td>54.3</td>
<td>46.6</td>
</tr>
<tr>
<td>3 Total cost (1+2)</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>


The rate of composition of wage cost for total cost was only 16.5 per cent in 1978. It was due to abundant labor supply in Korea. Raw material and the cost of capital was the biggest part of total cost, and the second biggest part of that was profit, interest, rent, etc. The third one was wage cost. Otherwise, these relations among elements of
costs represent the relative importance of cost push inflation in Korea.

The Effects of Money Growth

(Fig. 3) illustrates the annual percentage change of the narrowly defined money supply M1 and that of CPI. An average annual percentage change of money supply was 30.0 per cent during 1966-1983, but that of CPI was 14.4 per cent. From 1966 to 1983, money supply rose more rapidly than CPI except for the period in 1980-1981. The change rate of money supply was varied in that period. Otherwise, it was not stable. We cannot ascertain a relationship between the change of money supply and that of CPI in the figure.

Monetarists suggest that the change of price level (rate of inflation) is consistent with that of money supply in the long run, but short-term movements in price indexes are caused by nonmonetary factors (oil shocks, corp failures, etc.). Monetarists suggest that the current rate of change of price level was caused by the lagged rate of change of money supply. A simple monetary guideline to inflation is as follows:

The rate of change of price over the next year

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Fig. 3--The annual percentage change of money supply and CPI (1966-1983)

is equal the average of growth of the money stock over the previous five years.7

In the Fig. 3, we can find some evidence of above guideline. Two peaks of the annual growth rate of CPI may be caused by the previous two peaks of that of money stock. But we cannot find an obvious correlation between money supply and level in the graphical method.

We can find some reasons why monetary expansion cannot explain the inflationary process in Korea. First, the change in real interest rates paid on time deposits have had a big variation since 1966. During the period from 1966 to 1971, Korean economy had achieved high growth and economic stability. This was due mainly to the rise in real interest rates paid on time deposits beginning in 1966 (see TABLE VI). The change in the interest rate is the main element of monetary expansion. So, monetary policy alone cannot explain the inflation in the face of highly expansionary fiscal policy.8

The second reason was the existence of unorganized money market in Korea like other developing countries:


## TABLE VI

### PRICE INDEXES AND INTEREST RATES IN 1966-1983

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage change in WPI</th>
<th>Percentage change in CPI</th>
<th>Nominal interest rate</th>
<th>Real deposit interest rate **</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>9.0</td>
<td>11.7</td>
<td>30.0</td>
<td>+21.0</td>
</tr>
<tr>
<td>1967</td>
<td>6.4</td>
<td>11.1</td>
<td>30.0</td>
<td>+23.6</td>
</tr>
<tr>
<td>1968</td>
<td>8.1</td>
<td>10.6</td>
<td>26.0</td>
<td>+17.9</td>
</tr>
<tr>
<td>1969</td>
<td>12.1</td>
<td>12.5</td>
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</tr>
<tr>
<td>1970</td>
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<td>16.0</td>
<td>22.8</td>
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<td>+10.0</td>
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<td>1972</td>
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<td>11.7</td>
<td>15.0</td>
<td>+6.1</td>
</tr>
<tr>
<td>1973</td>
<td>4.7</td>
<td>3.2</td>
<td>12.6</td>
<td>+7.9</td>
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<td>1974</td>
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<td>24.3</td>
<td>15.0</td>
<td>-22.2</td>
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<td>1975</td>
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<td>25.3</td>
<td>15.0</td>
<td>11.6</td>
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<td>1976</td>
<td>12.1</td>
<td>15.3</td>
<td>15.6</td>
<td>+3.5</td>
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<tr>
<td>1977</td>
<td>9.0</td>
<td>10.1</td>
<td>15.8</td>
<td>+6.8</td>
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<td>1978</td>
<td>11.7</td>
<td>14.4</td>
<td>16.9</td>
<td>+5.3</td>
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<tr>
<td>1979</td>
<td>18.8</td>
<td>18.3</td>
<td>18.6</td>
<td>-0.2</td>
</tr>
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<td>38.9</td>
<td>28.9</td>
<td>19.5</td>
<td>-19.4</td>
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<tr>
<td>1981</td>
<td>20.4</td>
<td>21.3</td>
<td>17.4</td>
<td>-3.0</td>
</tr>
<tr>
<td>1982</td>
<td>4.6</td>
<td>7.3</td>
<td>8.0</td>
<td>+3.4</td>
</tr>
<tr>
<td>1983</td>
<td>0.2</td>
<td>3.4</td>
<td>8.0</td>
<td>+7.8</td>
</tr>
</tbody>
</table>

* Time deposit on one year base

** Adjusted for WPI (Nominal interest-WPI)

Because most of the regular bank loans and foreign-loan guarantee were, in fact, long term, there was an important need for the unorganized institutions to meet urgent short-term requirements.9

A Presidential Emergency Decree was promulgated on August 3, 1972, and introduced some drastic measure for the unorganized money market, but the purpose was collapsed because of the first oil-shock in 1973.10

9 Cole, p. 283.
10 Cole, p. 271.
CHAPTER III

SURVEY OF LITERATURE

Type of Inflation by Causes

Since most prices in a mixed economy result from the action of supply and demand, we can distinguish between explanations of causes of inflation that stress the demand side of the market (the so-called "demand-pull") and those which emphasize the condition of supply (the so-called "cost push"). Demand inflations are caused by an excess of aggregate demand goods and services over available supplies, at a given level of prices. For example, the monetarists' theory of inflation emphasizes increase in the supply of money faster than increase in the demand for money, which causes a larger demand for goods and services, thus tending to pull prices up.¹

On the other hand, the cost-push theory ascribes inflation to increases in cost which are independent of the state of aggregate demand. For example, the price increases for import goods caused by oil shock, wage

increase, foreign exchange devaluation, etc., will directly raise the cost of living through higher prices for finished good imports and indirectly through more costly imported materials used by domestic producers. In addition, trade unions may force wages up more rapidly than increases in labor productivity. It is especially called the name "wage push" inflation.

Monetarists suggest that:

Inflation is a persistent rise in the overall (or average) level of prices of all goods and services. This definition must be distinguished from an increase in relative prices (e.g., a rise the price of wheat or oil) which, as argued below, is not inflation. Some advocates of the cost-push view confuse relative price changes with changes in the overall price level. \ldots{} Changes in the prices of individual goods do not cause inflation, although they do affect its measurement.\(^2\)

Otherwise, nonmonetary factors can produce temporary effects on the measured rate. They maintain that only monetary factors are a reasonably good guide to the year-to-year behavior of prices.\(^3\)

Monetarist and Structuralist

There have been many attempts to empirically test the economic relations assumed by one side or the other in the monetarist-structuralist debate. Structuralists and monetarists disagree on the cause of inflation and


\(^3\)Batten, p. 22.
appropriate policy response to inflation.

Monetarist's position on the cause of inflation can be summarized briefly in that excess demand is responsible for price increases. Increase in money income occurs in response to increases in aggregate demand. So, they do not consider either structural or cost-push causes of inflation. Monetarist's model assumes the rate of growth of the money stock as an exogenous variable. The policy prescriptions offered by monetarist that inflation must be ended with a program of monetary and fiscal restraint since it is the lack of such restraint which led to the rising prices.

The structuralist approach was used to explain causes of inflation of Latin America in the 1950s. Those of Latin American countries have experienced the high inflation relatively. Especially, food bottlenecks are assumed to generate inflation because developing countries' nonfarm prices are relatively fixed whereas their agricultural prices are flexible. Structuralists differ in the emphasis they give to various factors. They stress that "structural causes" are at the root of


inflation. Change in import price can also have important direct and indirect effects on domestic prices. Indeed, in a world of fixed exchange rates, external inflation may have a primary role in causing domestic inflation. Structuralists regard the agriculture and foreign trade as well as government sectors as the causes of inflation with economic development. 6

Both monetarists and structuralists think the role of money as the cause of inflation. But monetarists regard the monetary expansion as an exogenous variable. Many studies support the growth of money stock as an endogenous variable in developing countries. 7

Theoretical Formulation

A great many models of the inflationary process have been proposed in the last years, and it would not be possible to cover them all in this paper. I surveyed some monetarist and structuralist models to explain the inflationary process. Monetarists emphasize that inflation is primarily a monetary phenomenon; that is:

6 Wacher, p. 4.

The primary factors influencing future inflation are current and past behavior of the money stock. They regard the rate of growth of real income, together with the impact of inflationary expectation and any lagged adjustment to changes to the money stock.

On the other hand, structuralists think that money stock is an endogenous variable as well as exogenous. They regard the rise of food price as another exogenous variable to explain inflation.

a) A Typical Simple Test

In the quantity equation \( MV = PY \), monetarists think that the velocity of money is very stable in the economic process, so they regard that the rate of change of velocity is constant in the short run.

\[
MV = PY \quad \cdots \cdots \quad (1)
\]

take the natural log of both sides of (1)

\[
\ln M + \ln V = \ln P + \ln Y
\]

regard that \( \ln V \) is constant

---


9 Harvilesky, p. 233.

10 Subrate Ghatak, Monetary Economics in Developing countries (New York, 1981), pp. 73-75.

11 Ghatak, pp. 69-70.
\[ DP = a + bDM - cDY \]

where \( DP \) = annual rate of inflation \( (DP_t - DP_{t-1}) / DP_{t-1} \)
\( DM \) = annual rate of money stock
\( DY \) = annual rate of real income growth

This model is carried out by Meiselman on pooled data for sixteen Latin American countries in the period 1950-1969. He obtains the following results:

\[ DP = 1.35 + 1.05DM - 1.38DY \]
\[ \text{R}^2 = 0.98 \] (t values given in parentheses)

This results implies that for a given growth rate of real income, price changes are the consequence of changes in the money stock.

b) Harberger's Model\(^{12}\)

Harberger's model was used in empirical analysis of the causes of inflation in Chile. After its publication, his model was used by Vogel to explain the inflation in sixteen Latin American countries. Econometric model is as follows:

\[ DP = k + dDM_t + eDM_{t-1} - (1+a)DY_t + b(DP_{t-1} - DP_{t-2}) \]

where \( DP \) = the annual percentage change of price level

$DM_t = \text{the current percentage change of money supply}$

$DY_t = \text{the annual percentage change of real income}$

$DP_{t-1} - DP_{t-2} = \text{the rate of change of the expected cost of holding money}$

All variables are expressed as percentage changes. He used quarterly data as well as an annual data. He made many similar models including wage as an explanatory variable:

$$DP_t = DY_t + DM_t + DM_{t-1} + (DP_{t-1} - DP_{t-2}) + DW_t$$

where $DW_t = \text{the percentage change of nominal wage}$

Harberger does not adopt the entirely monetarists' position. His model was a mixed monetarist and structurist model. His hypothesis was tested by using 20 yearly observations from 1939 to 1958. The result is follow:

$$DP_t = -1.15 - 0.89DY_t + 0.70DM_t + 0.29DM_{t-1} + 0.16A_t + 0.13$$

$$DW_t$$

$$R^2 = 0.87 \ (t \ \text{values given in parentheses})$$

where $A_t = DP_{t-1} - DP_{t-2}$

The explanatory power of his equation was good and the result appeared reasonable.

c) St. Louis' model
We can say that this model is the core of monetarist models. It explains that measures as total spending, prices, and unemployment are terms of changes of money. They based this on empirical evidence amassed over the variety of periods. To illustrate the effect of non-monetary factors on the measured rate of inflation, (Fig. 4) depicts the effect of transitory non-monetary shock on the trend rate of inflation.


Fig. 4--Effect of transitory nonmonetary shock on the trend rate of inflation
The slope of line (the rate of inflation) was related to the trend rate of money growth. If the price of oil has increased at time $t_0$, the result had been an increase in the level of prices over. The higher price level (the slope of BD) is depicted in the figure by time span $t_0$ to $t_1$. From $t_0$ to $t_1$, the measured rate of inflation is higher than that attributed solely to monetary factors. Once adjustment period ends, the rate of inflation represented by the same slope of the line (AB and DE).

It means that while non-monetary factors can influence the measured inflation for relatively short period, monetary factors determine the long-term path of inflation.

St. Louis econometric model for the inflation is as follows:

$$DP = a_0 + a_1 \sum_{i=0}^{n} w_i DM_{t-i} + u$$

where $DP = \text{rate of change of prices, measured as the first difference in the natural logarithm.}$

$DM = \text{rate of change of money stock, measured as the first difference in the natural logarithm.}$

This equation implies that the rate of change of prices can be expressed as a function of the rate of change of the money stock in the current and previous period. If

---

the sum of coefficient of DM becomes 1, it means that
the rate of change of prices can be explained by that
of the money stock perfectly, without considering non-
monetary factors. 14

14 Denis S. Karnosky, "The Link Between Money and
Prices in 1971-1976," Federal Reserve Bank of St. Louis
CHAPTER IV
ANALYSIS OF THE EMPIRICAL RESULTS

Test with Annual Time Series Data

To find out whether these changes are cause of inflation, we hypothesized that Korea inflation was a "mixed" inflation generated not only by monetary factors but also structural factors. The hypothesis was tested by regression analysis using time series data based on 23 yearly observations from 1961 to 1983. The statistical significance of the estimated coefficients has tested at a five per cent level.

First, a typical simple model carried by Meiselman was used for analysis. DM is the percentage change of the narrowly defined money supply M1, DY is the percentage change of real income growth, and DWPI, DCPI, and DGD are the percentage change of WPI, CPI, and GD. The results are summarized as follows:

1) \[ \text{DWPI} = 26.157 - 1.021\text{DY} - 0.099\text{DM} \]
\[ (5.68) \quad (-2.53) \quad (-0.87) \]
\[ R^2 = 0.2939 \quad DW = 1.290 \]

\(^1\text{M1} = \text{currency plus demand deposit} \]
\(^2\text{GD} = \text{GNP deflator} \]
2) DCPI = 24.001 - 0.675DY - 0.127DM
    (6.83) (-2.19) (-1.47)
    $R^2 = 0.2991$  $DW = 1.952$

3) DGD = 22.287 - 0.174DY - 0.121DM
    (5.71) (-0.51) (-1.25)
    $R^2 = 0.0975$  $DW = 1.439$

Figure in parentheses indicate t-statistic and DW stands for Durbin-Watson d-statistic. The results are very poor. All coefficients of independent variables are not significant statistically at a five per cent level except the intercept terms. The intercept terms indicate what would happen to the price level if real income, money stock, and the like remained unchanged. Especially, the coefficients of money stock are not significant statistically and have negative signs. The results imply that the current money supply cannot explain the cause of inflation during the period 1961 to 1983 in Korea.

I added the import prices as an explanatory variable to above three equations for the period 1961 to 1983. The better results are summarized belows:

4) DWPI = 18.582 - 0.725DY - 0.070DM + 0.331DPI
    (5.05) (-2.46) (-0.87) (4.53)
    $R^2 = 0.6604$  $DW = 1.540$
5) DCPI = 20.177 - 0.525DY - 0.113DM + 0.167DPI
   \( (5.67) \) \( (-1.84) \) \( (-1.44) \) \( (2.36) \)
   \( R^2 = 0.4585 \quad DW = 2.104 \)

6) DGD = 17.476 - 0.014DY - 0.102DM + 0.210DPI
   \( (4.62) \) \( (-0.05) \) \( (-1.23) \) \( (2.80) \)
   \( R^2 = 0.3606 \quad DW = 1.652 \)

where DPI = the annual percentage change of import prices.

The results were improved to some degree. All coefficients of DPI are significant at a five per cent level of significance. The coefficient DPI in equation 4) indicates that one per cent change in import prices, other things being equal, causes the increase of about 0.33 per cent in WPI. The coefficient of determination \( R^2 \) in equation 4) is larger than that in equation 5) because WPI is seen to give the greatest weight to intermediate goods, including imported goods.

Second, Harberger's model was applied to the test the hypothesis with same data for the period 1961 to 1983. The results are summarized as follows:

7) DWPI = 28.445 - 1.022DY - 0.108DM - 0.066DM \( t-1 \)
   \( (4.45) \) \( (-2.37) \) \( (-0.82) \) \( (-0.55) \)
   \( R^2 = 0.3057 \quad DW = 1.714 \)

8) DWPI = 25.326 - 1.115DY - 0.040DM - 0.0289DM \( t-1 \)
   \( (4.39) \) \( (-1.11) \) \( (9-0.34) \) \( (0.26) \)
   0.364At
   \( (2.32) \)
   \( R^2 = 0.5438 \quad DW = 1.715 \)
9) \[ \text{DWPI} = 16.432 - 1.041D_{Yt} - 0.039D_{Mt} + 0.003D_{Mt-1} + \]
\[ 0.354A_t + 0.393D_{Wt} \]
\[ R^2 = 0.7069 \quad DW = 1.328 \]

10) \[ \text{DCPI} = 24.945 - 0.722D_{Yt} - 0.104D_{Mt} - 0.032D_{Mt-1} \]
\[ (5.17) \quad (-2.22) \quad (-1.05) \quad (-0.36) \]
\[ R^2 = 0.3008 \quad DW = 2.005 \]

11) \[ \text{DCPI} = 25.072 - 0.731D_{Yt} - 0.105D_{Mt} - 0.033D_{Mt-1} + \]
\[ 0.107B_t \]
\[ (4.59) \quad (-1.95) \quad (-0.99) \quad (-0.32) \]
\[ R^2 = 0.2819 \quad DW = 1.822 \]

12) \[ \text{DCPI} = 16.565 - 0.643D_{Yt} - 0.100D_{Mt} - 0.058D_{Mt-1} + \]
\[ 0.172B_t + 0.357D_{Wt} \]
\[ (4.99) \quad (-2.03) \quad (-1.11) \quad (-0.65) \]
\[ R^2 = 0.5223 \quad DW = 2.217 \]

13) \[ DGD = 24.044 - 0.174D_{Yt} - 0.128D_{Mt} - 0.051D_{Mt-1} \]
\[ (4.43) \quad (-0.48) \quad (-1.15) \quad (-0.50) \]
\[ R^2 = 0.1008 \quad DW = 1.420 \]

14) \[ DGD = 22.752 - 0.153D_{Yt} - 0.107D_{Mt} - 0.031D_{Mt-1} + \]
\[ 0.220C_t \]
\[ (4.13) \quad (-0.42) \quad (-0.95) \quad (-0.30) \]
\[ R^2 = 0.1637 \quad DW = 1.927 \]

15) \[ DGD = 16.003 - 0.164D_{Yt} - 0.110D_{Mt} - 0.026D_{Mt-1} + \]
\[ 0.257C_t + 0.302D_{Wt} \]
\[ (2.73) \quad (-0.50) \quad (-1.08) \quad (-0.28) \]
\[ R^2 = 0.3565 \quad DW = 1.918 \]
where $DM_t = $ the one period lagged change of DM
$A_t = $ expected prices of WPI $(\text{WPI}_{t-1} - \text{WPI}_{t-2})$
$DW_t = $ the annual percentage change of nominal wage
$B_t = $ expected prices of CPI $(\text{CPI}_{t-1} - \text{CPI}_{t-2})$
$C_t = $ expected prices of GD $(\text{GD}_{t-1} - \text{GD}_{t-2})$

All coefficients of the change in real income are significant at a five per cent level in equation 7), 9), and 10). The average value of coefficient of the change in real income, other things being equal, causes a fall of one per cent in the price level.

All coefficients of the current and lagged change in money supply are not statistically significant. That implies that the current and lagged change in money stock, other things being equal, does not cause the increase in the current price level.

In equations 8), 9), 11), 12), 14), and 15), the expected price of WPI, CPI, and GD $(A_t, B_t, \text{and} C_t)$ were added as explanatory variables. They are also called as the cost of holding money. These variables will be affected by the interest rate and they can be regarded as effects of past acceleration of inflation. Two coefficients of these variable in equations 8) and 9) are significant at a five per cent level.

---

The percentage change in wages are added in equation 9), 12), and 15). All coefficients of wages are significant. The values of coefficients of these represent a size of effects to the price level.

To test for the presence of autocorrelation in time series, the Durbin-Watson d statistic was used. DW statistic is represented in each equation, 1) through 15). Each of the equations has a little bit different critical value because each equation has a different number of explanatory variables. The values of DW in equations 1) through 15) fall in the indecisive zone except for 2), 5), 10), 11), 12), 14), and 15) at the five per cent level of significance. That means that we cannot conclude whether autocorrelation does or does not exist in these equations. Other equations, 2), 5), 10), 11), 12), 14), and 15) do not suffer from the autocorrelation problem. 4

Comparison with Other Countries

a) U. S. Data

In this part, to compare the result from Korean data with that from U. S. data, I will apply U. S. data to Harberger's regression model which was adopted to analyze

the Korean data.

In the United States, the rate of inflation was relatively low and moderate the last decades. An average annual percentage change of price level (measured in terms of CPI) was about 5.5 per cent during the period 1961 to 1983. That of money supply (M1) was about 5.8 per cent during the same period. In spite of large supply shocks (oil shocks in 1973 and 1979) and wage/price controls (in August 1971), the annual rate of money stock was very in keeping with that of price level in the long run.

U. S. data was tested by the same regression model which was applied to Korean data using time series data based on 23 yearly observations from 1961 to 1983. The results are as follows:

16) $\Delta CPI = 4.920 - 0.818D + 0.189DM_t + 0.392DM_{t-1}$
   
   $R^2 = 0.4137 \quad DW = 1.309$

17) $\Delta CPI = 4.706 - 0.772D + 0.189DM_t + 0.381DM_{t-1}$

   $0.142At$

   $R^2 = 0.3851 \quad DW = 1.585$

All coefficients of the current and lagged change in money stock do not have negative signs like the result from Korean data. That implies that the increase of money stock causes the increase in the current price
level. But all coefficients of monetary variables are not significant at a five per cent level of significance. The reason might be too large of supply shocks and price/wage controls in the United States during the sample period.

Next, pure monetarist's model was adopted to the U. S. data. The results are as follows:

18) \[ \text{DCPI} = -1.909 + 0.501DM_t - 0.234DM_{t-1} + 1.127DM_{t-2} \]
\[ R^2 = 0.3608 \quad DW = 1.565 \]

19) \[ \text{DCPI} = -3.436 + 0.230DM_t + 0.016DM_{t-1} + 0.666DM_{t-2} \]
\[ 0.806DM_{t-3} \]
\[ R^2 = 0.4776 \quad DW = 1.494 \]

All coefficients of monetary variables have positive signs except \( DM_{t-1} \) in equation 18). Especially, the coefficients of \( DM_{t-2} \) in equation 18) and \( DM_{t-3} \) in equation 19) are significant at a five per cent level. That implies that the current price level is caused by the two and three period lagged change of money stock.

In the case of Korea, all coefficients of current and lagged value of money stock do not have positive signs. Different results are obtained when annual data based on 23 yearly observation from 1961-1981. The
results are as follows:

20) \[ DCPI = 21.808 - 0.193DM_t - 0.108DM_{t-1} + 0.049DM_{t-2} \]
\[ (3.72) \quad (-1.51) \quad (-0.88) \quad (0.42) \]
\[ R^2 = 0.1971 \quad DW = 1.769 \]

21) \[ DCPI = 23.046 - 0.280DM_t - 0.204DM_{t-1} + 0.194DM_{t-2} + 0.101DM_{t-3} \]
\[ (3.55) \quad (-2.74) \quad (-1.93) \quad (1.78) \quad (0.92) \]
\[ R^2 = 0.5840 \quad DW = 1.380 \]

The coefficients of \( DM_{t-2} \) and \( DM_{t-3} \) only have right signs, but they are not significant statistically.

b) Other Developing Countries

Arnold Harberger's model was applied to explain Chilean inflation for the period 1939-1958. He used various price indexes as dependent variables. His explanatory power of his equations was good and the results appeared reasonable. After his publication, his regression model was adopted to other Latin American countries by other analysts. Robert Vogel's study showed that Harberger's model was also well applied to Latin American countries.\(^5\) Latin American countries have experienced an almost entirely high inflation experience.

But the Asian countries have experienced relatively

low and moderate inflation. Saini's study showed that the Harberger-type model was not adequately adopted to the six Asian countries. His study especially supported the theory that the monetary factors were captured by the non-monetary factors in those countries. He pointed out several reasons why his result was different from Harberger's. There are different inflationary experience and different economic structures and widely dissimilar economic performances. Another pointed out was two oil shocks during Saini's sample period.6

c) Cross Country Comparisons

Monetarists show a good example of money growth and inflation. (TABLE VII) shows a cross-country comparison of the rate of money growth and price level over 20-quarters period for major industrial nations. The countries are ranked in descending order according to the rate of money growth experienced during the period. The country of high rate of money growth have high rate of inflation. Especially, an average percentage change of money supply was 10.3% and that of inflation was 10.2% in these countries.

TABLE VII

MONEY AND INFLATION IN THE MAJOR INDUSTRIAL NATIONS (IV/1975-IV/1980)

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual rates* of money growth</th>
<th>Annual rates** of inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>20.5%</td>
<td>17.1%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>12.3</td>
<td>13.7</td>
</tr>
<tr>
<td>France</td>
<td>10.0</td>
<td>10.7</td>
</tr>
<tr>
<td>United States</td>
<td>7.5</td>
<td>9.1</td>
</tr>
<tr>
<td>Canada</td>
<td>7.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Japan</td>
<td>7.2</td>
<td>6.3</td>
</tr>
<tr>
<td>Netherland</td>
<td>6.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Average</td>
<td>10.3</td>
<td>10.2</td>
</tr>
</tbody>
</table>

*M1 for all countries except the U. S.
**Consumer price index

We can see that the annual rates of money growth very corresponds with that of inflation in the major industrial countries.

We can see another example that the annual rates of money growth are not in keeping with those of inflation in some developing countries. In the majority of these countries, the annual rates of money supply were doubled that of inflation (TABLE VIII).
TABLE VIII

MONEY AND INFLATION IN SEVEN DEVELOPING COUNTRIES (1976-1980)

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual rates* of money growth</th>
<th>Annual rates** of inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>31.9%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Korea</td>
<td>27.4</td>
<td>18.7</td>
</tr>
<tr>
<td>Ecuador</td>
<td>24.5</td>
<td>11.7</td>
</tr>
<tr>
<td>Pakistan</td>
<td>22.1</td>
<td>9.0</td>
</tr>
<tr>
<td>Costarica</td>
<td>21.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>20.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Honduras</td>
<td>18.2</td>
<td>9.5</td>
</tr>
<tr>
<td>Average</td>
<td>23.6</td>
<td>11.5</td>
</tr>
</tbody>
</table>

*M1
**Consumer price index

In descending order according to the rate of money growth, Korea and Honduras violate the ordering of inflation with the rate of money growth. An average percentage change of money supply was 23.6%, but that of inflation was only 11.5% in these countries.

The Limitation of Analysis

Inflation is like the weather: everyone talks
about it; no one does not anything about it.\footnote{George W. Wilson, \textit{Inflation} (Bloomington, 1982), p. 1.}

That means that no one can find the cause of inflation exactly, and that inflation is beyond our control. The monetarist's theory is summarized as follows:

Inflation is primarily a monetary phenomenon; that is, the primary factors influencing future inflation are the current and past behavior of the money stock.\footnote{R. W. Hafer, "Inflation: Assessing Its Recent Behavior and Future Prospects," \textit{Federal Reserve Bank of St. Louis Review}, LXV (August/September, 1983), p. 36.}

But I would like to say that inflation may be caused by all economic aspects. Only money, import prices, and wages were to analyze the cause of inflation in this study. I don't think absolutely that these results from three economic aspects are enough to find generations of inflation in Korea.

Many econometric models have been developed and applied to many countries over a variety of period for analysis of inflation. But, in my study, Harberger's type of inflation model has focused on the inflation in Korea. Jae Wan Chung's study showed that the nature and causes of inflation in Korea were caused by multi-factors, both internal and external factors by using the two-way causation between prices and wages.\footnote{Jae Wan Chung, "Inflation in Newly Industrialized Country: The Case of Korea," \textit{World Development}, X (July, 1982), pp. 531-539.} According to his explanation, the classical two-way is as follow:
Prices are assumed to increase due to increases in wages and the costs of capital and materials, on the one hand, and due to increases in aggregate spending and thus economic growth, on the other hand.  

Another obstacle to find causes of inflation is the existence of the black market where prices are higher than official ones:

This discrepancy not only made the public distrust the official price statistics, but also caused formation of a distorted and higher expectation of future prices on the basis of black-market prices.  

This statistical discrepancy and higher expectation of future prices will be an obvious limitation to find exact causes of inflation in Korea.

Conclusion

In this chapter, Harberger's model was applied to find out causes of inflation in Korea. Only the changes of import prices and wage were significant statistically. But I could not find an obvious relationship between the rate of inflation and that of monatary expansion in Korea for the period 1961-1983. Generally, it is known that the money supply is less responsible for the behavior of inflation in developing countries. We can find some reasons why the variation of money supply cannot explain

---


well the variation of price level in those countries.

First, we can find an economic bottleneck in developing countries. In this situation, the supply of money is not sensitive for the price level. Larger investment will be required to achieve the economic growth in developing countries than industrial countries.

Second, in the course of economic development, monetization may have endogenized the growth in money supply. Structural changes may make part of the monetary growth endogenous. We can one example from Canavese's study:

Both a growing industrial sector and an increasing urbanization produce a change in the amount and structure of food and raw materials demanded. Low agricultural sector productivity does not allow for a quick response of supply to the new demand. The relative price of agricultural goods tends to rise. If industrial prices are inflexible downward because of an oligopolistic market structure, money prices of agricultural goods must rise. . . . The whole process assumes the existance of passive money supply that assures equilibrium in money market.12

Saini's study showed that money supply in the six Asian countries may have endogenous variables, so he thought that the monetarists' model failed in the explanation of inflation in those countries.13

Third, change in velocity of money may also have played a part in the inflation experience of developing


13Saini, p. 871.
countries. Monetarists postulate that the velocity of money is stable in the long run, so the growth rate of price level will be only related to the changes of money supply. But in the case of Korea, the velocity of money was not stable for the period 1966-1983. In comparison with the United States, the velocity of money in the U. S. was more stable than that in Korea for the same period (APPENDIX). In this variation of velocity, monetarists' models could not explain the causation in money and inflation.

Fourth, it is well known that there are unorganized money markets in developing countries because of a limited supply of funds. A well developed financial system is important for efficient allocation of capital between competing uses. These different financial structures between the industrial countries and developing countries may be a cause of why the monetarists' model is not appropriate for the explanation of inflation in developing countries.

Finally, large external shock was an obstacle to explain the cause of inflation by using the monetarist's model. Since 1973, these non-monetary factors may have an important role in the behavior of inflation in major

industrial nations as well as developing countries.\textsuperscript{15}

Because of above reasons, many empirical results show that growth of money supply may not be the primary source of inflation in developing countries.

CHAPTER V

CONCLUSIONS

Summary

Korean economy, with a recent history of rapid economic growth, has been experiencing a series of problems between economic growth and price stability. This study has focused on three economic aspects to survey causes of inflation in Korea during the period 1961-1983. I adopted some empirical models in regression analysis of time series data in Korea.

The correlation between inflation and import prices was positive and significant statistically. We can say that inflation in Korea was transmitted from resource-exporting countries.

Money supply in Korea was not stable during the sample period. The rate of growth of money stock doubled that of the price level. In the regression analysis, monetary variables were not significant statistically. The monetarist model was inadequate in explaining the variation in prices. Like any other developing country, we can find some reason why the monetarist model was not suitable for explaining the causes of inflation.
There are the existence of economic bottleneck, money supply as an endogenous variable, the variation of velocity, an unorganized money market, and large external shocks in developing countries. In addition, I can point out the variation of real interest and the existence of black market in Korea.

The correlation between wage and inflation was significant statistically. It may not have played an important role in Korea because the wage cost was a relatively small part of total cost for products.

Policy Implications

The increase in the prices of imported raw materials transferred to the domestic price level directly, since Korea's exports and imports of goods and services already accounted for approximately 35.3 per cent and 37.8 per cent of GNP in 1983. It seems that independent domestic measures for price stabilization have only a limited effect. Beginning in 1973, however, Korea was faced with a new type of inflation, which can be described as "imported inflation."

Monetarists and structurists agree with the idea that money supply has an important part in the fight against inflation. To extend that such major price (raw material and capital goods) increase due to foreign
influence, inflation could not be immediately prevented by domestic monetary restraints. In this situation, traditional monetary policies are inappropriate. Phillip Cagan proposed "accommodated monetary policy." That is as follow:

Supply the monetary growth needed to sustain the higher prices resulting from foreign influence. Monetary growth was reduced and the usual signs of a tight monetary policy appeared, reflecting an unusually sharp decline in the real value of money balances due to slower monetary growth and higher inflation.1

The growth rate of nominal wage also affected to the price level. Domestic inflation can be tamed in some degree. It is needed to make a standard wage rate reflecting labor productivity and price level.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal GNP</th>
<th>Real GNP at 1975 constant market price</th>
<th>Growth rate of GNP</th>
<th>GNP deflator</th>
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Song, B. L., Korean Economy, Seoul, Korea, p. 215.
<table>
<thead>
<tr>
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<th>GNP deflator (1980=100)</th>
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<td>17,123</td>
<td>55.2</td>
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*GDP = GNP - net factor income from abroad

Fig. I

Annual percentage change of GDP deflator
# TABLE III

Velocity of money in Korea, 1966-1983

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Y</th>
<th>M1*</th>
<th>Quasi M</th>
<th>M2**</th>
<th>V1</th>
<th>V2</th>
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<tr>
<td></td>
<td>Billions Of won</td>
<td></td>
<td></td>
<td>Y/M1</td>
<td></td>
<td>Y/M2</td>
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<td>85</td>
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<td>157</td>
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M1* = Money plus demand deposit,  M2** = M1 + Quasi money.

## TABLE IV

### Velocity of money in the United States, 1966-1983

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<tr>
<th>Year</th>
<th>Nominal Y</th>
<th>M1*</th>
<th>Quasi-M</th>
<th>M2**</th>
<th>V1 Y/M1</th>
<th>V2 Y/M2</th>
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</thead>
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<td>Billions of U. S. Dollars</td>
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<td></td>
</tr>
<tr>
<td>1966</td>
<td>756.0</td>
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<td>143.5</td>
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M1* = Money plus demand deposit,  M2** = M1 + Quasi money  
Fig. II

Velocity of Money (V1)

Korea

United States
Fig. III

Velocity of money (V2)
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