Inflation and Growth : The Korean Experience

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I. Introduction

There are too many conflicting explanations for the inflation and growth experiences of different countries. The two most prominent explanations have been based on the monetary and structural theories of the relation between inflation and growth. Monetarists contend that economic growth is negatively correlated with inflation. A continued inflation diminishes not only the volume of resources available for domestic investment but also the efficiency of investment. They argue that price stability is a necessary prerequisite for sustained economic growth. Not only is community saving reduced, but a significant part of this reduced flow of resources to uses which are not of the highest social priority.

In contrast, structuralists believe in a positive regression coefficient. The structuralists consider that, in an economy with major bottlenecks and downward rigidity of prices, the attempt to achieve price stability through monetary or fiscal policy will result in unemployment and slow growth. The structuralists generate a second-best justification for inflation as a deliberate instrument of growth. Particularly in many less developed countries, due to

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low voluntary savings, inadequate financial markets and an inelastic tax system, the major portion of the development programs has been financed by an inflationary finance. In this context inflation tends to raise rates of saving and investment, augmenting capital formation. Still others contend that whatever connections may be established between the rate of inflation and the rate of economic growth, are likely to be weak, tenuous links rather than strong and fundamental relationships.

In examinations of the inflation and growth experience of many countries, statistical evidence also comes to conflicting conclusions. For example, Tun Wai (1959) found that "for the less developed countries in general the findings did indeed prove to be inconclusive, but for most of the small number of individual countries for which the available statistics cover periods in which the rates of price increase differ significantly, the evidence suggests that the rate of growth was higher when the rate of inflation was lower". Bhatia (1960) could find "no systematic relationship between price changes and the rate of growth". It is true that there have been countries with low rates of inflation which have had the full gamut of experience with respect to economic growth. The same is also true with respect to high rates of inflation. Based on a cross-section study of 51 countries, Thirlwall and Barton (1970) contended that mild inflation is conducive to growth. Nontheless, they drew a conclusion that there exists a strong negative relation between inflation and growth for countries which experienced high inflation, e.g., in excess of 10 per cent per annum. All this conflicting evidence reflects real-world complications in the effect of inflation on growth.

The purpose of this paper is to clarify the relationship between inflation and growth, in an attempt to reconcile these conflicting points of view. A simple model which describes the essence of the relationship will be presented in the next section. It is shown that mild inflation is conducive to growth while rapid inflation is detrimental to growth. In the model real money balances provide an explicit bridge between growth and inflation. If money, defined as real balances, is introduced explicitly in the aggregate demand and balances will affect output level. Money is not neutral and the effect of inflation on growth can be explained. It is shown that changes in the rate of inflation affect growth. An increase in the rate of inflation has an adverse effect and a reduction in that has a positive effect on growth. Economic growth is dependent not only upon the inflation rate, *per se*, but also on variations in its rate or price instability. The Korean experience of inflation and economic growth during 1958—1978 is presened in section Ⅲ, which agrees with the arguments. Concluding remarks end the paper.

Ⅱ. The Model

An important feature of the model is its emphasis on the role of money in determining the price level and real output. The model is monetary in that sense. The model has its origin in monetary studies developed by Friedman (1969), and Cagan (1956). In particular, Friedman argues that real money balances are a factor of production to the productive enterprise. At the same time, money is one kind of asset, one way of holding wealth to the ultimate wealth-owning units. Consumption therefore depends on real balances as well as other forms of wealth, the price of and return on these forms of wealth and the tastes and preferences of the wealth-owning units.

The aggregate demand is the sum of consumption and investment, or

(1) $Y=C(Y,r,m)+I(Y,r)$

where Y is real income, r is the rate of interest. Real money balances(m) are nominal money stock divided by the price level. Consumption is assumed to be a function of income, the interest rate and real balances. Investment is a function of the level of real income and the rate of interest. The output market is in equilibrium when saving is equal to investment,

(2) $Y=f(r,m)$

Real money balances are included explicitly in the above IS curve in order to show the role of money in the product market. In equation (2), $\frac{\partial f}{\partial m}$ is expands and the IS curve shifts outward.

The demand for money is assumed to be a function of the level of real income, the rate of interest, and the inflation rate. The demand for real balances is then,

(3) $m^d = \frac{M}{P} = m(Y, r, \pi)$

where M and P denote nominal money stock and the price level, respectively, and $\pi = \frac{d \log P}{dt}$ is the rate of inflation[1]. The partial derivative of money with respect to π is assumed negative. Inflation diminishes desired real balances because it imposes a tax on cash balances by depreciating the value of money. The sign for r is negative. For simplicity, nominal money stock is exogenously determined. The price level and real balances are simultaneously determined at a given level of money stock when the demand for and supply of money are equal, which gives the LM curve,

(4) $m = m(Y, r, \pi,)$

Combining (2) and (4), we obtain a reduced form equation between Y, m and π:

(5) $Y^d = g(\pi, m)$

The price level is implicitly included in the aggregate demand curve through the presence of a real money balances variable. If the elasticity of real money balances with respect to the interest rate is negative, signs for both m and π are positive in (5).

As indicated by several writers[2], real money balances may be assumed to be a factor of production. The rationale for including real balances in the productionfunction relates, in part, to the increased economic efficiency derived from using money compared with a barter economy. We postulate that the supply of output is subject to the following production function:

(6) $Y = q(K, L, m)$

where K and L are capital stock and labor employed, respectively. Marginal product of real balances is positive in the production function. Capital stock is assumed to grow exogenously. The conditions for profit maximizaassume the level of the money wage rate to be fixed exogenously and assume perfect elastic labor supply at this wage rate. The aggregate supply curve is then,

$$(7)\quad Y^s = h\left(\frac{W}{P}, m\right)$$

where W is the money wage rate. Money explicitly affects the supply of output in (7). It is expected that partial derivative with respect to the real wage is negative and $\frac{\partial h}{\partial m} > 0$. The above model constitutes a sectional system in which the number of equations is less than that of endogenous variables. Combining equations (2), (4), and (7), the overall equilibrium output may be expressed by a reduced form:

$$(8)\quad Y^* = k\left(\frac{W}{P}, \pi\right)$$

In the above equation, we have assumed that the level of income is the dependent, and the rate of inflation and real wage rate, the independent variables. That is, the direction of causation is assumed to flow from the rate of inflation to growth, not the other way around, in order to see the effect of inflation on growth. Equilibrium level of output is expected to decrease as $\frac{W}{P}$ and/or π increase. It is particularly true when the partial derivative of supply with respect to real money balances is larger than that of demand[3]. An important characteristic of (8) is that output level is affected not only by the price level but also by the rate of change of the price level. In application π must be interpreted as an "expected" rate of inflation.

In order to show the relation between inflation and economic growth, it is useful to transform equation (8) into rate-of-growth form, relating the growth rate of income to the growth rates of the independent variables to which they are functionally related. This can be done by taking logarithms of the variables and differentiating with respect to time, which gives,

$$(9)\quad \frac{d\log Y}{dt} = \alpha \frac{d\log\left(\frac{W}{P}\right)}{dt} + \beta \frac{d\log \pi}{dt}$$

$$= \alpha\left(\frac{d\log W}{dt} - \pi\right) + \beta \frac{d\log \pi}{dt}$$

Where α denotes the elasticity of income with respect to the real wage rate, and β, that with respect to the inflation rate. Both elasticities are expected to be negative. The rate of inflation is one of several very important influences at work. Other forces influence the rate of economic growth, although there are only two variables in the model. Their effects may overwhelm any effects arising from inflation. Since both α and β are negative in (9), the rate of inflation has a positive effect and the change in the rate of inflation has a negative effect on growth. In fact these conflicting effects make the relation between growth and inflation complicated. The net effect could therefore be positive, negative or insignificant. It is emphasized in the model that real balances have an important role as a connection between growth and inflation. Real balances are included in both aggregate demand and supply curves with plus signs. As real balances grow, so does output. Real balances, in turn, are a decreasing function of the rate of inflation. Therefore, growth is negatively related to the change in the rate of inflation as far as money is concerned.

In order to test the hypothesis statistically, equation (4) may be specified in alog-linear form as follows:

(10) $\log m = a_0 + a_1 \log Y + a_2 \log r + a_3 \pi^2$

The coefficient a_1 is the elasticity of real money balances with respect to in come and is positive. The sign of a^2 is assumed negative. The sign of a_3 is negative because inflation imposes a tax on real balances. The above equation is a Cagan type demand function for money. Cagan ignores terms for log Y and log r, and includes π instead of π^2 in order to emphasize the effect of hyper-inflation on the demand for money[4]. An implication of Cagan's demand function is that variations in the rate of change in prices have the same effect on real cash balances in percentage terms regardless of the absolute rate of inflation by a linear relation between the rate of change in prices and the logarithm of real cash balances. That implication seems proper when only hyper-inflation is under consideration. However, when a wider range of inflation, from mild to rapid, is to be considered, π^2 seems wly in percentage terms as inflation proceeds at a stage of mild inflation. It is more likely to decrease at an accelerating rate rather than a fixed rate in the range of high inflation. A curved logarithmic form with respect to the rate of inflation as specified in (10) may well capture this feature.

Assuming a linear system together with equation (10), we may specify the reduced form equation (8) as follows:

$$(11)\quad \log Y^* = b_0 + b_1 \log\left(\frac{W}{P}\right) + b_2\pi^2 + b_3 t$$

A time variable t is included in order to represent such trends as technical progress, institutional changes, and so on. The signs of b_1 and b_2 are expected to be negative. The sign of b_3 is positive. Differentiating (11) with respect to time,

$$(12)\quad \frac{d \log Y}{dt} = \varepsilon + \alpha\left(\frac{d \log W}{dt} - \pi\right) + \beta\pi \cdot \frac{d\pi}{dt}$$

where $\alpha = b_1 < 0$, $\beta = 2b_2 < 0$, and $\varepsilon = b_3 > 0$) is constant.

The above equation is in continuous time. The discrete approximation, taking annual rates of change of the variables, may be written as:

$$(13)\quad \dot{Y} = \varepsilon + \alpha\dot{W} - (\alpha + \beta\dot{P}_{-1})\dot{P} + \beta\dot{P}^2$$

where $\dot{Y}$ is annual rate of change of income, $\dot{P}$ is annual rate of inflation, and $\dot{W}$ is annual rate of change in nominal wage rate. The lagged variable $\dot{P}_{-1}$ denotes the inflation rate of the preceding year. Taking partial derivative of (13) with respect to the rate of inflation,

$$(14)\quad \frac{\partial\dot{Y}}{\partial\dot{P}} = -\alpha - \beta\dot{P}_{-1} + 2\beta\dot{P}$$

It is now clear from (14) that the effect of inflation on growth can be positive, zero or negative, depending upon the current rate of inflation as well as the preceding year's rate. That is,

$$(15)\quad \frac{\partial\dot{Y}}{\partial\dot{P}} \gtreqless 0 \qquad \text{as} \qquad \dot{P} \lesseqgtr \frac{\alpha}{2\beta} + \frac{1}{2}\dot{P}_{-1}$$

Therefore, when the rate of inflation is to a certain extent lower than that of the preceding year, inflation has a positive effect on growth. Although it growth as long as the preceding year's rate was much higher, chances of having positive effect are better for mild inflation. At a certain range of mild inflation, the current year's inflation rate does not necessarily have to be lower than that of the preceding year in order to be positive on growth. It could be even higher than the rate of the preceding year's inflation if $\dot{P}_{-1}$ is sufficiently low and $\frac{\alpha}{2\beta}$ is relatively large in (15). Some statistical studies in fact reveal that mild inflation is conducive to growth. Yet others find the effect of inflation inconclusive. On the other hand, even if the current year's rate of inflation is not that high but not sufficiently low, its effect on growth could still be negative if the preceding year's inflation was relatively low. In the short-run, inflation rates fluctuate considerably around the trend rate. A reduction in the rate of inflation may result in accelerating growth. The effect could be positive, negative or insignificant depending upon the current rate of inflation, that of the preceding year, and upon the value of α and β.

If the rate of inflation is steady, i.e., $\dot{P}=\dot{P}_{-1}$ from (14),

$$(16) \quad \frac{\partial \dot{Y}}{\partial \dot{P}} \gtrless 0 \qquad \text{as} \qquad \dot{P} \lessgtr \frac{\alpha}{\beta}$$

Therefore, if the rate of inflation is higher than a certain level (the ratio of the elasticity of income with respect to the real wage rate to that with respect to the inflation rate), the effect on growth is negative, and *vice versa*. In general, it is more likely that the effect of inflation on growth is positive with mild inflation, and negative with rapid inflation.

We can now reconcile the controversy between monetarists and structuralists by clarifying the relation between inflation and growth. The model also put forward the thesis that price instability rather than the rate of inflation, *per se*, is a more serious problem in countries with rapid inflation. It is interesting to note that high inflation is necessarily subject to wide variation[5]. The main disadvantage of price instability, in turn, is that it increases variations in growth and hence uncertainty.

III. Empirical Results: The Korean Experiences

The Korean economy has experienced fairly high rates of inflation with wide variations since the late 1950s. Over the years 1958—1978, the wholesale price index increased by about 12.6 percent per annum, the range of increases being between −6.5 percent and 42.1 percent (see table I). The standard deviation of the inflation rate was 10.7 or about 85 percent of the average rate of inflation. During the same period the average growth rate of gross national product (GNP) was 8.2 percent. The growth rate fluctuated significantly within the range of 1.1 percent and 15.1 percent. GNP however, included significantly large and unstable portion of agricultural production, which occupied about 22 percent to 47 percent of total GNP. Its share decreased significantly along with industrialization. Agricultural production, including forestry and fishery production, fluctuated considerably from year to year due to weather conditions and natural events, contributing significant instability to growth. For example, agricultural production decreased in five years during the period, while non-agricultural production grew about 10.7 percent per annum and showed less variations with a standard deviation of 5.0 or about 47 percent of the average growth rate.

Table I. Growth, Inflation and Real Balances

	$\dot{Y}$	$\dot{P}$	$\dot{m}$	r (%)*
1958	3.9	−6.5	36.1	11
1959	7.6	2.6	19.7	12
1960	3.7	10.2	−12.9	12
1961	0.0	13.8	40.6	15
1962	9.5	8.8	14.8	15
1963	8.7	20.5	−10.8	15
1964	5.1	35.1	−14.9	15
1965	11.5	9.9	38.8	18
1966	13.6	9.0	48.3	30
1967	15.9	6.4	51.9	30
1968	17.2	8.4	58.7	27.6
1969	15.6	6.4	51.7	24

1971	12.0	8.8	11.0	22.1
1972	7.3	13.8	17.6	15.4
1973	18.2	6.9	27.5	12.6
1974	8.5	42.1	−12.7	15.0
1975	7.7	26.6	1.3	15.0
1976	16.6	12.1	19.0	15.5
1977	12.8	9.0	28.1	16.2
1978	16.1	11.7	20.8	16.9
Average	10.7	12.6	21.5	17.9

Sources: *Economic Statistics Yearbook*, various years' issues, Bank of Korea
* Nominal interest rate on one-year time deposit.

We shall use the non-agricultural GNP data for the remainder of this section. Real money balances also grew on average 21.5 percent per annum. The variations of the changes in real money balances were particularly high with its standard deviation of 22.7 or more than 100 percent of the average growth of real money balances.

In order to investigate the relationship between the growth rate of income and that of real money balances, the growth rate of income $\dot{Y}$ is plotted against the growth rate of real money balances $\dot{m}$ in Figure I. Real money balances are measured by broadly defined money M_2 divided by the wholesale price index. Apparently a positive relationship exists between these two rates of growth. We may therefore draw approximately a linear trend curve between these two variables despite wide variations. The considerable variat ions around the trend curve may be explained primarily by the changes in the bank deposit rates associated with the inflation rate. In Korea, the interest rates are set by the government at low levels relative to the inflation rates. The government usually took low interest rate policy, as in other less developed countries, except for the period of the financial reform of 1965—1972. During the years 1965—1972, both the bank deposit and lending rates were pegged at highl evels (Table I). The financial reform itself increased the demand for money in Korea, and lessened the rate of inflation.[6]

In Figure II the rate of changes in real money balances $\dot{m}$ is plotted against the inflation rate in the same fashion as in Figure I. It shows an inverse relation between $\dot{m}$ and $\dot{P}$. Real money balances grow fast in the growth rate of money balances decreases as the inflation continuously goes up. Real balances even reduce significantly in the range of high inflation. This implies that high inflation imposes a tremendous tax on holding money balances.

Figure Ⅲ depicts the relationship between growth and inflation. Actually we may draw it by putting Figures Ⅰ and Ⅱ together. It is interesting to note that, if wide variations are ignored, there appears to be an inverse U shape curve skewed to the right with a long right hand tail. Wide variations admittedly resulted from a variety of influences other than inflation which affect economic growth significantly. In the range of negative or mild rates of inflation income grows at a moderate rate per annum. As the price level increases faster, income grows faster too. The maximum growth is reached however when the inflation rate becomes about 9 percent. The growth rate decreases after this threshold, as the inflation rate goes up higher. The shape and position of the growth-inflation curve is generally defined by

Figure Ⅰ. Growth rates of output and Real money balances, 1958—1978

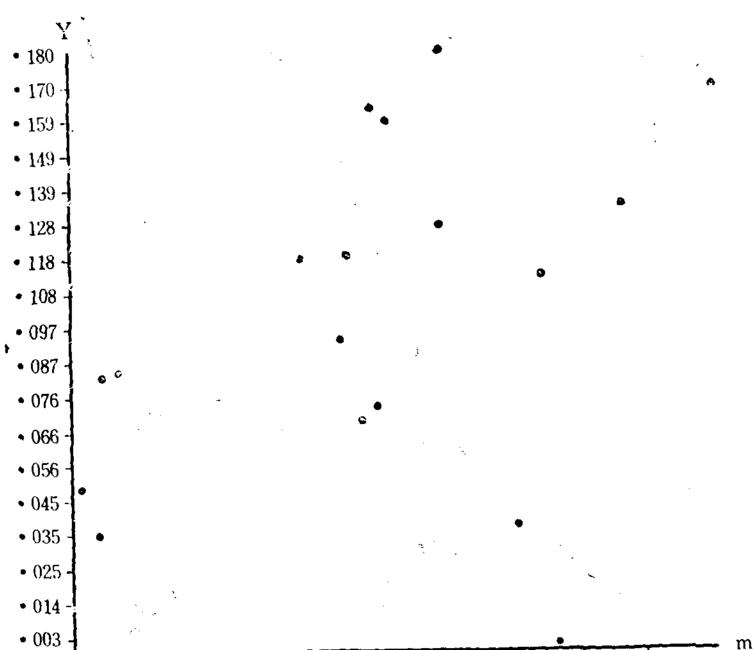


Figure II. Inflation and the rate of growth of real money balances, 1958－1978

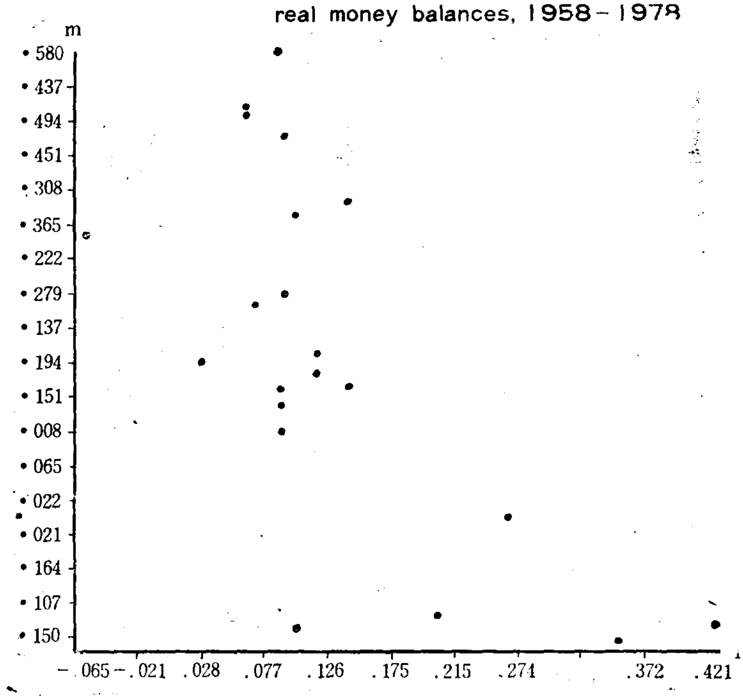
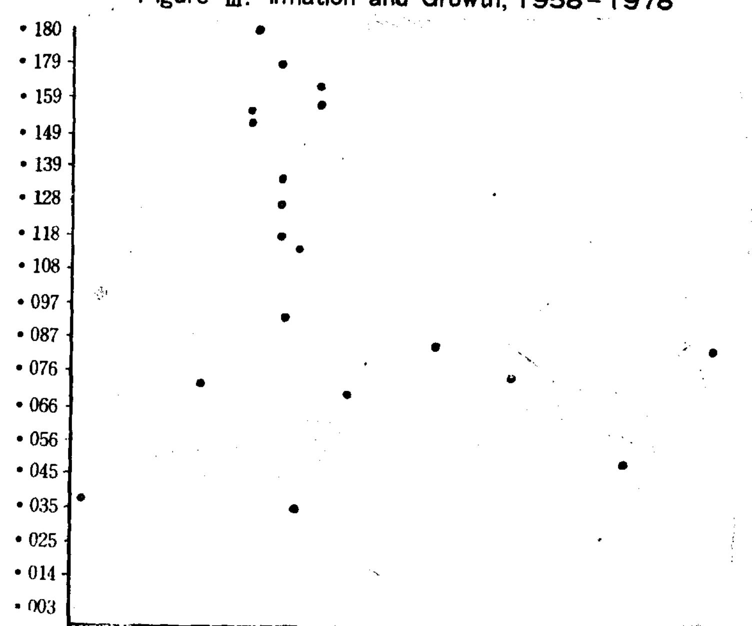


Figure III. Inflation and Growth, 1958－1978



the structure of a country's economy.[7] For most countries with mild inflation, the curve is more likely to skew to the left, showing a positive effect of inflation on growth. In certain cases, actual observations may just show an upward slopping curve without any noticeable downward sloping part (a right-hand tail). On the other hand, it is quite possible for a high or hyper-inflation country to have only a downward sloping curve without having a left-hand tail. In general we may expect an inverse U shape curve for the full gamut of inflation experience.

In order to test quantitatively the inverse U shape curve, our model is applied to the Korean data for the period of 1958—1978. In particular, equation (13) in the previous section is to be estimated. Since the equation gives rise to the problem of multi-collinearity among independent variables, both sides of (13) are divided by $\dot{P}$, which gives the ratio form,

$$(17)\quad \frac{\dot{Y}}{\dot{P}} = -\alpha - \beta\dot{P}_{-1} + \beta\dot{P} + \alpha\frac{\dot{W}}{\dot{P}} + \varepsilon\left(\frac{1}{\dot{P}}\right)$$

The above equation is an average product curve of inflation in terms of economic growth. The average product of inflation depends not only upon the current and lagged rates of inflation but also upon the ratio of wage growth rate and inflation, and the inverse of the inflation rate. More generally, we may modify (17) by removing some restrictions on coefficients, that is α's and β's.

The final form of the equation is,

$$(18)\quad \frac{\dot{Y}}{\dot{P}} = \alpha' + \beta'\dot{P}_{-1} + \gamma\dot{P} + \partial\frac{\dot{W}}{\dot{P}} + \varepsilon\left(\frac{1}{\dot{P}}\right)$$

where α', β' and ε are positive, γ and ∂ are negative. Equation (18) is initially estimated by ordinary least squares method, the results of which are reported in Table II (Column I). The coefficient of determination is fairly high despite uses of ratios and growth rate variables. Signs are consistent with our expectations except that for $\dot{W}/\dot{P}$. The positive sign for the coefficient of $\dot{W}/\dot{P}$ conflicts with the model developed in the previous secmay represent some improvements of quality of labor and the growth of labor productivity. For the purpose of purging improvements of labor quality from the wage rate index, quality adjustments of labor are made on the wage rate, using a quality of labor index estimated by Yeon (1979). The quality of labor index was constructed based upon the changing distribution of the 25 Korean industries' labor force by years of school completed. However, the weighted labor quality index has missed considerable part of the quality improvement of labor due to experience and on-the-job training because of the lack of data.

Table Ⅱ. Regression Results of $\dot{Y}/\dot{P}$

Coefficients of variables for	Ordinary Least Squares Method	Cochrane-Orcutt Method	
	I	Ⅱ	Ⅲ
Constant	.4472 (1.74)	1.1450* (2.58)	1.0147* (3.12)
$\dot{P}_{-1}$	.6236 (.57)	−.5910 (−.56)	
$\dot{P}$	−2.1652 (−1.91)	−3.9004* (−3.53)	−3.6996* (−3.66)
$\frac{\dot{W}}{\dot{P}}$	.2907 (1.98)	.0058 (.03)	
$\frac{1}{\dot{P}}$	.0760* (6.06)	.0731* (7.45)	.0745* (8.26)
R^3 D-W Rho	.79 1.48	.80 2.12 .63	.79 2.06 .61

Numbers in parentheses are t-statistics.
D-W indicates Durbin-Watson Statistics.
* significant at a 5 percent level.

He therefore pointed out that the quality index may understate the real contribution of quality change in labor. If this is the case, the coefficient for $\dot{W}/\dot{P}$ in our regression can be positive partly because the improvements of labor quality imbedded in the wage rate index have a positive effect on ificant. The Durbin-Watson statistics indicates that the test of the presence of first-order serial correlation is inconclusive.

In order to reduce possible serial correlation, however, the Cochrane-Orcutt technique is applied. The estimation resuls are shown in column Ⅱ. The constant term and coefficients for $\dot{P}$ and $1/\dot{P}$ are all significant at a 1 percent level and have correct signs. The coefficient for $\dot{W}/\dot{P}$ is not significant at any meaningful level. The coefficient for the lagged variable $\dot{P}_{-1}$ is also not significant. Therefore, two variables, $\dot{P}_{-1}$ and $\dot{W}/\dot{P}$ are dropped. Again, Cochrane-Orcutt technique is applied. Column Ⅲ shows that all signs are correct and that all coefficients are significant at a 1 percent level. The coefficient of determination is also good. The growth-inflation curve appears to be an inverse U shape curve. Problems of simultaneity and interdependence between inflation and growth have not been addressed in the context of the estimation procedures given the exploratory nature of the study.

Ⅳ. Concluding Remarks

A simple model is developed in this study in an attempt to clarify the relation between inflation and growth. It is emphasized in the model that real balances have an important role as a connection between growth and inflation. Real balances are included in both aggregate demand and supply curves with plus signs. As real balances grow, so does output. Real balances, in turn, are a decreasing function of the rate of inflation. Therefore growth is negatively related to changes in the inflation rate as far as money is concerned.

However, the model can explain various conflicting points of view and reconcile the controversy between monetarists and structuralists on inflation and growth. It is shown that mild inflation is conducive to growth and rapid inflation is detrimental to growth. It is relevant to note that both marginal and average products of inflation in terms of growth could be positive or negative depending upon the rate of inflation and other variables. Therefore, there exists an inverse U shape curve which depicts the relationship between inflation and growth. For most countries with mild inflation, the inverse U shape curve is more likely to skew to the left with a long left-hand tail. On the other hand, the curve is more likely to skew to the right with a long right-hand tail for most countries with high inflation. It is also quite possible that actual observations for some countries' experiences only included upward sloping curve without having any noticeable downward sloping part of the curve, and *vice versa*. The exact shape and position of the growth-inflation curve is particular to each country and is hence an empirical question.

The model is applied to the Korean experience of growth and inflation for the period of 1958—1978. The empirical results agree with our model. The simple reduced form approach may give rise to problems of simultaneity and misspecification errors. Also the assumption of exogenous money supply may not be valid in countries like Korea with a relatively large foreign sector and fixed exchange rates. However, it seems to suffice for the purpose of our investigation.

NOTES

1. Friedman (1969), and Cagan (1956)
2. Friedman (1969), Levhari and Patinkin (1968), and Sinai and Stokes (1972).
3. The Model is stable in this case.
4. Cagan assumed that during the hyper-inflation, changes in the demand for money were dominated by changes in inflation expectations so that the effects of relatively small changes in output and the real rate of interest on the demand for money may be ignored.
5. Cole (1976) points out that there is some correlation between the rate of inflation and the average deviation of prices from its trend level. His study also indicates that price instability has negative effect on growth. Based on 32 less developed countries, it is shown that variations in the rate of inflation are more closely associated (negatively) with the growth than the inflation rate itself.
6. McKinnon (1976).
7. Brazil also has experienced a similar inverse U shape curve. See Cardoso (1979).
8. The quality of labor index covers for the period of 1962—1976. For our purpose,

indexes for years, 1958—1961, and 1977—1978 were estimated by a simple extrapolation. The regression coefficient for $\dot{W}/\dot{P}$ based on unadjusted wage rate index is also positive and much larger than the ones shown in Table II.

REFERENCES

- Bank of Korea, *Economic Statistics Yearbook*, various issues.
- Bhatia, R. "Inflation, Deflation, and Economic Development", *IMF Staff Papers*, November 1960.
- Cardoso, E. "Food Supply and Inflation", Mimeograph, Instituto de Planejamento Economics and Social 1979.
- Cagan, P., "The Monetary Dynamics of Hyperinflation", in *Studies in the Quantity Theory of Money*, ed. by M. Friedman, University of Chicago Press, 1956.
- Cole, D., "Concepts, Causes, and Cures of Instability in Less Developed Countries," in *Money and Finance in Economic Growth and Development*, edited by R. McKinnon, Marcel Dekker, Inc., 1976.
- Friedman, M., "The Optimum Quantity of Money", in the *Optimum Quantity of Money and Other Essays*, Chicago: Aldine Publishing Co., 1969.
- Levhari, D., and D. Patinkin, "The Role of Money in a Simple Growth Model", *American Economic Review*, September 1968.
- McKinnon, R., "Saving Propensities and the Korean Monetary Reform in Retrospect", in *Money and Finance in Economic Growth and Development*, edited by R. McKinnon, Marcel Dekker, Inc., 1976.
- Sinai, A., and H. Stokes, "Real Money Balances: An Omitted Variable from the Production Function?" *Review of Economics and Statistics*, August 1972.
- Thirlwall, A. and C. Barton, "Inflation and Growth: The International Evidence," Banca Nazionale del Laboro *Quarterly Review*, September 1971.
- Wai, U Tun, "The Relationship between Inflation and Economic Development: A Statistical Inductive Study," *IMF Staff Papers*, October 1959.
- Yeon, H. *Productivity, Labor Quality Indexes and Labor Structures in the Korean Industries*, KDI Working Paper 7901, 1979.