A Test of Two Open-Economy Theories: Oil Price Rise and Italy

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The goal of the study is to empirically discriminate between two open-economy theories. The Keynesian theory holds that there is no, or only a very weak, homeostatic mechanism and, in the absence of government intervention, real income tends to remain below the level of full employment. In the monetary interpretation, the homeostatic mechanism is strong, and real income can be treated as though it were exogenous. This study examines the response of Italy to the sharp increase in oil prices in late 1973. The experience of Italy, as an oil-importing country, supports the monetarist view.

INTRODUCTION

The Keynesian and monetarist theories dominate macro-economics, in general, and open-economies, in particular. The main goal of this study is to empirically discriminate between the two theories of open-economies.

Keynesian and monetarist theories contain fundamentally different views about the long-run equilibrium state of the economy. Their views differ on the effectiveness of market forces in re-establishing the full-employment level of real income. Keynesian theory views market forces as being weak in re-establishing the full-employment level of income, so that, in the absence of government intervention, real income tends to remain below the full-employment level. Monetarist theory, on the other hand, views market forces as being strong enough to re-establish full-employment relatively quickly. For classic references to the Keynesian approach, see Fleming (1962) and Mundell (1963, 1964).

This study, therefore, uses the different predictions implied by the two approaches with respect to the sharp increase in oil prices that took place in late 1973 to discriminate between them. The experience of Italy, as an oil-importing country, supports the monetarist view. For classic references to the monetary approach to balance of payments, see Frenkel and Johnson (1976) and Johnson (1972, 1976).

This study is organized in the following way. Section II discusses the conceptual basis used for the construction of an empirical test to discriminate between the monetarist and Keynesian theories. Section III empirically tests the response of Italy to a major real shock, i.e., the sharp increase in oil prices in late 1973. Section IV summarizes the major conclusions.

CONCEPTUAL FRAMEWORK OF THE TEST

This section discusses the construction of a test that can discriminate between the two open-economy theories. The approach is based on the different views Keynesians and monetarists have about the role of stability (homeostasis). This difference is considered the basis for constructing the discriminatory test. For a classic discussion of the ideas separating Keynesians and Monetarists, see Mayor (1978), Chapter 1, pp. 1-46.

The analysis concentrates on one of the fundamental issues separating monetarist and Keynesians – the effectiveness of market forces in re-establishing full-employment. In the monetary interpretation, market forces are strong and, in the long run, real income can be treated as though it were pre-determined. In Keynesian models, market forces are weak, and in the absence of government intervention, real income tends to remain below its full-employment level.

If market forces tending to re-establish equilibrium are strong and effective, the monetarist assumption that income can be treated as exogenous is reasonable. In that case, open-economy adjustment for a small country under fixed exchange rates must take place through changes in the stock of money or relative prices rather than through changes in employment and output. If market forces are weak and there is persistent under-employment, then income becomes endogenous as the positive feedback of multiplier analysis dominates the opposite feedback assumed by monetarists. In that case, open-economy adjustment normally involves alterations in employment and output. Restated, monetarists believe that a country's response to an external real shock will be through an adjustment in relative prices with no long-run change in employment and output. Keynesians believe that the adjustment will work through employment and output. These differing predictions provide a basis for the construction of a discriminatory test.

The controversy over stability (homeostasis) is based on different views about the effectiveness of market forces in re-establishing equilibrium. If market forces are effective, as monetarists believe, then if the economy is shocked, equilibrium tends to be re-established relatively quickly. If market forces are weak, as Keynesians believe, then the economy is at the mercy of random shocks and autonomous factors. If market forces tend to re-establish full employment quickly after some contractionary shock, then it is reasonable to view annual income as approximately determined by the existing labor force, capital stock, technology, etc. Keynesians, however, believe that it is only by coincidence that an economy is at full employment because market forces are not strong, and a contractionary shock can lead to prolonged unemployment. In terms of the production possibilities frontier, monetarists believe that the economy is either on the frontier or moving towards it. Keynesians, on the other hand, believe that the economy tends to be inside the feasible set represented by the frontier. In terms of growth, given a random shock, monetarists permit a short-run deviation from the full-employment growth path, but believe that the economy tends to return to a full-employment growth path relatively quickly. Keynesians, on the other hand, believe that the economy will follow a new growth path, different from the original one. These differing views about the strength of market forces can provide the basis of a discriminatory test.

In Keynesian models of an open economy, imports directly and positively depend on income and income is an endogenous variable. Monetarists, on the other hand, have a different view. The macro-economic assumptions of the monetarists appear to rest, explicitly or implicitly, on the micro-economic foundations provided by the classical model of international specialization and exchange. In that framework imports are financed by exports and, in the absence of growth, there is no relationship between imports and income. An increase in imports is an increase in supply of exports, either goods or assets. This shift in imports may alter the composition of output, but it does not create unemployment.

For the monetarist theory, on a comparative basis, exports finance imports and there is no relationship between imports and income. The full-employment condition leaves no place for autonomous changes in imports to affect income. Admittedly, an autonomous increase in imports may cause output to decrease in the short run, but over time, the economy will be pushed back to its original full-employment level and there will be no long-run reduction in the output. This adjustment process can be visualized as an inward move of the economy within the production possibility frontier in the short run, and returning back to it in the long run. The price-theoretic approach of monetarists, of course, would be the vehicle for the adjustment process, i.e., the change in relative prices and the corresponding substitution in consumption and production.

Using time series data to estimate an import function, however, has no discriminatory power. In a growth context, the pure theory of trade and the monetarist approach to the open economy imply a positive relationship between income and imports. This situation can be visualized as a shift in the production possibilities frontier that, given relative prices, results in a higher level of imports, more exports, and higher income. Therefore, the monetarist model in the context of growth is consistent with the same positive relationship between output and imports implied by the Keynesian model. However, if one were able to

account for the effects of economic growth, then it might be possible to see if exogenous changes in imports affect income.

In order to account for growth, factors associated with growth can be introduced into the estimating equation (1):

Y = income
IM = imports
X = exports
POP = population
K = capital stock
T = index of technological progress
D = first difference operator

$$D\text{IM} = a_0 + a_1.DY + a_2.D\text{POP} + a_3.DK + a_4.DT \tag{1}$$

where population, the capital stock, and technological progress are treated as exogenous. Now, the effect of growth is captured by the last three variables. Therefore, a_1 can be considered as showing the effect of an autonomous increase in income on imports. From the foregoing analysis, an insignificant a_1 would support the monetarist theory.

Most of the major oil-importing countries adopted flexible rates early in the 1970s. Therefore, we need to consider how an autonomous increase in the price of a major import is likely to affect income in a Keynesian approach when exchange rates are flexible.

Under flexible exchange rates, an increase in the value of imports shifts the IS curve to the left and depreciates currency. As a result, imports decrease, exports increase, and the IS curve shifts back to the right in order to intersect the LM curve at the fixed level of world interest rate. See Johnson (1972). This means that after all adjustments have taken place there is no change in income as a result of an autonomous increase in imports. For a series of papers on the Keynesian view see: Fried and Schultze (1975). However, if the increase in imports is the result of the increase in price of an imported raw material that constitutes an important factor of production, then after the leftward shift in the IS curve, the increased raw material prices will be reflected in a higher domestic price level and increased demand for money. The LM curve shifts to the left, and in the absence of expansionary monetary policy, the IS curve also must shift to the left in order to intersect with the LM curve at the fixed world interest rate and lower level of income. For an autonomous increase in the price of an important raw material that is not produced domestically, a Keynesian approach suggests a negative b_1, while the monetarist theory expects an insignificant b_1.

$$DY = b_0 + b_1.D\text{IM} + b_2.D\text{POP} + b_3.DK + b_4.DT \tag{2}$$

The sign of b_1 of course is determined only if we can identify the change in imports as exogenous.

The basic idea behind equations (2) can be expressed as follows: Given an exogenous increase in the price of an important raw material that is imported tends to reduce income under a Keynesian approach. Monetarists admit that there will be a short-run reduction in output and employment, but contend it will not be long before the economy returns to the full-employment level of output.

In short, for the importing country of an important raw material, an exogenous increase in the value of the raw material leads to two different outcomes by Keynesian and monetarists. Keynesians, based on the multiplier process, believe that when there is an exogenous increase in the value of an import, the income of the importing country decreases, and in the absence of other shocks, remains low. Monetarists, based on their view of market forces, believe that for the importing country, income may go down in the short run, but it will not be long before it returns to the full-employment level. This difference suggests that the test can be applied and evaluated, which is done in the next section. The exogenous shock examined is the increase in oil prices in 1973-74. The importing country is Italy.

STATISTICAL APPLICATION OF THE DISCRIMINATING TEST

The purpose of this section is to see whether the consequences of the oil price rise for an oil-exporting or an oil-importing country are more consistent with the Keynesian or the monetarist theory. This section examines the response of Italy, an importing country, to the sharp increase in oil prices in late 1973. The annual data are obtained from various issues of I.M.F.'s "International Financial Statistics" for the 1953-1978 time period. Note should be taken that data collection was stopped at 1978 which marks the point before the next round of oil price rise. The unemployment rates are from various issues of United Nation's publications: "Statistical Yearbook" and "Monthly Bulletin of Statistics."

A clear example of an exogenous shock in the international sphere is the sharp increase in oil prices in the mid 1970s. In late 1973, there was an unprecedented increase in oil prices, which is treated here as a purely exogenous shock to an oil-importing country. It was exogenous because it was based on the negotiations that took place among Organization of Petroleum Exporting Countries (OPEC). It was a shock, because the magnitude of the change was huge and sudden; within three months oil prices tripled. See Jahangir Amuzegar (1977), p. 60.There is a sizable literature on various issues related to the oil price shocks. See, for example, Farzanegan and Markwardt (2009), Jimenez-Rodriquez (2008), and Zhang (2008).

Among the oil-importing countries, Italy is chosen. The criteria for choosing this country are two. First, oil constitutes a relatively major portion of its total imports, and second, the ratio of its imports to its income is relatively high. These ratios are shown in Table 1.

The tremendous increase in oil prices in late 1973 resulted in a huge increase in the value of oil imports for oil-importing countries. For an oil-importing country, Keynesian theory implies that it should follow a lower growth path because of increased imports and reduced demand for domestic output. Monetarist theory, although admitting a short-run downward deviation from the growth path of output, expects the original growth path to be followed in the long run.

In terms of the growth path, Keynesian theory suggests that oil-importing countries will move to a new lower growth path of income than would otherwise follow had the oil price change not occurred. Monetarist theory implies that income in these countries may deviate from its original growth path downward in the short run, but should revert back in the long run. In the early 1970s, industrialized countries abandoned fixed exchange rates, and adopted a system of floating exchange rates. In Section II it was shown that for an important imported raw material, and under flexible exchange rates, Keynesians and monetarists expect the same results (with respect to the variables under consideration) as they do under fixed exchange rates, respectively.

This basic idea can be applied to the rate of unemployment. The unemployment rate does not move along a growth path, but fluctuates around an average rate. The average rate of unemployment in the absence of the price hike, shown in Table 2 and Figure 1, is obtained using unemployment rates available up to 1973. The movements of actual unemployment rates around the average unemployment rate, concentrating on post-1973 years, constitute a test of Keynesian and monetarist theories. That is, unless the shock from higher oil prices is completely offset by depreciation of the currency, Keynesian theory suggests that the unemployment rate increases after 1973 and stays above the average rate that prevailed before 1973. Monetarist theory permits unemployment to increase in the short run, but implies that unemployment should return to its normal level in the long run.

Using unemployment rates, the average and actual unemployment rates are reported in Table 2 and plotted in Figure 1. The results support the monetarist theory. Unemployment rises sharply after 1977, a delay of four years. This pattern is presumably due to factors other than the oil price hike.

TABLE 1
OIL/IMPORT AND IMPORT/INCOME RATIOS

Year	Oil/IM	IM/Y
1953	10	12
1954	12	12
1955	11	12
1956	11	13
1957	12	14
1958	12	12
1959	11	12
1960	9	15
1961	9	15
1962	9	15
1963	8	17
1964	10	15
1965	11	14
1966	11	15
1967	12	16
1968	12	15
1969	11	17
1970	11	18
1971	13	18
1972	11	19
1973	11	22
1974	22	29
1975	19	22
1976	19	25
1977	19	24
1978	17	24
1979	17	26

TABLE 2
UNEMPLOYMENT RATE

Year	Rate
1953	8.8
1954	8.8
1955	7.6
1956	9.4
1957	8.2
1958	6.5
1959	5.5
1960	4.2
1961	3.5
1962	3.0
1963	2.5
1964	2.7
1965	3.6
1966	3.9
1967	3.5
1968	3.5
1969	3.4
1970	3.2
1971	3.2
1972	3.7
1973	3.5
1974	2.9
1975	3.3
1976	3.7
1977	7.2
1978	7.2
1979	7.7

FIGURE 1
UNEMPLOYMENT RATE

Figure 1
Italy: Unemployment Rate
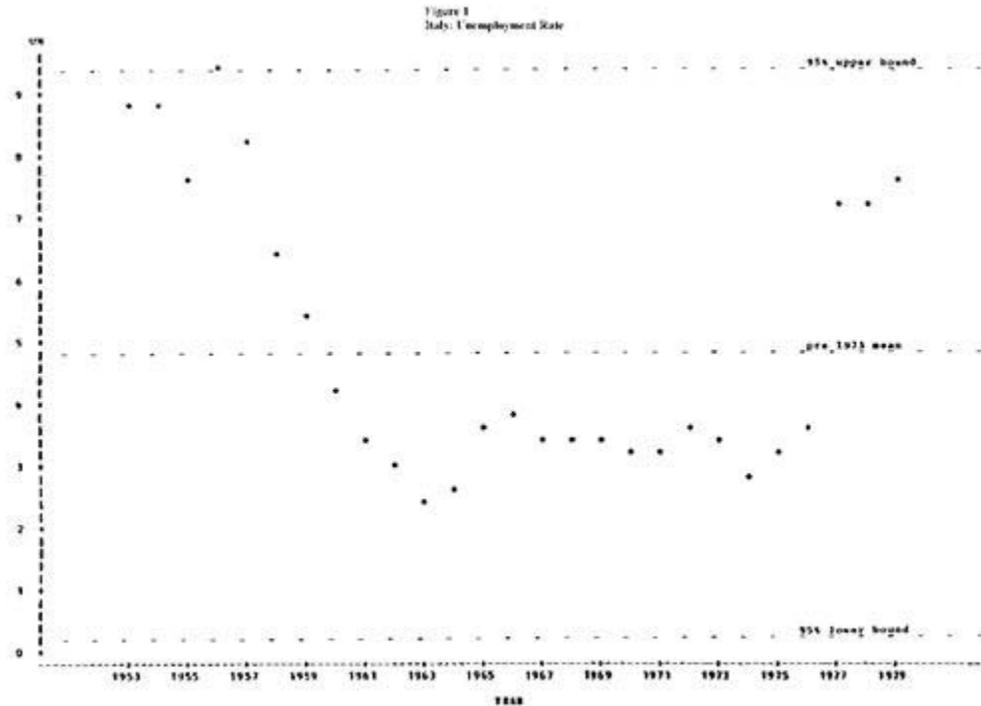
CONCLUSION

Two major open-economy theories are the Keynesian and monetarist theories. The goal of the present study is to empirically discriminate between the two theories.

Keynesian and monetarist views about the homeostatic mechanism are fundamentally different and provide the basis for a discriminatory test. On the homeostatic mechanism, Keynesian theory holds that there is no, or only a very weak, homeostatic mechanism and, in the absence of government intervention, real income tends to remain below the level of full employment. In the monetary interpretation, the homeostatic mechanism is strong, and real income can be treated as though it were exogenous.

This study examines the response of Italy to the sharp increase in oil prices in late 1973. The experience of Italy, an oil-importing country, is in complete conformity with the monetarist approach.

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