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On the Role of Stabilization Policies in the Middle East

by
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ABSTRACT

This investigation evaluates the real and inflationary effects of stabilization policies across countries of the Middle East. Three measures of stabilization policies are under consideration: the growth of the money supply, the growth of government spending and the devaluation of the domestic currency. The empirical evidence evaluates the importance of demand-side and supply-side constraints to the effects of these policies on real output growth and price inflation. The increased private propensity to spend exacerbates the size of demand shifts attributed to monetary policy. In contrast, the effects of government spending on aggregate demand shifts appear larger where the private propensity to spend is small. Supply-side constraints dominate, however, the size of demand shifts in differentiating the real and inflationary effects of stabilization policies. The less binding capacity constraints are, the flatter the aggregate supply curve and real output growth is more responsive to monetary growth acorss countries. And the more binding capacity constraints are, the steeper the aggregate supply curve and the inflationary effects of fiscal and devaluation policies are larger. Variations in monetary growth and their effects on price inflation and output growth dominate, however, the observed differences in economic performance acorss countries. Structural differences have limited the effects of variations in fiscal policy on economic performance across countries. In contrast, structural differences appear to have reinforced the effects of variations in monetary growth, and to a lesser extent devaluation, on economic performance. Indeed, the evidence is consistent with an important role for monetary growth in increasing the trend and variability of price inflation across countries. The contribution of trend devaluation appears also important in escalating trend price inflation across countries. More importantly, monetary policy appears successful in achieving real lasting effects that contribute positively to trend real output acorss countries.

ملخص

يتم فى هذا البحث تقويم آثار سياسات التثبيت الأقتصادى التى تطبقها بلدان الشرق الأوسط على المنتج من السلع و الخدمات و الأسعار. و يغطى التحليل السياسة النقدية و المالية و سياسة أسعار الصرف. و بأستخدام أسلوب التحليل الكمى، يتم تقويم مدى أهمية القيود على جانبى العرض و الطلب فى تحديد آثار هذه السياسات على النمو الحقيقى للمنتج من السلع و الخدمات و على الأسعار. و تكون السياسة النقدية أكثر تأثيرا على حجم الطلب على السلع و الخدمات إذا كان الميل للانفاق الخاص مرتفعا، هذا بينما تكون السياسة المالية أكثر تأثيرا على حجم الطلب إذا كان الميل للانفاق الخاص ضعيفا. و بوجه عام، تبدو القيود على جانب العرض أكثر أهمية بالمقارنة بالقيود على جانب الطلب بالنسبة لتحديد آثار سياسات التثبيت الأقتصادى. و يبدو أن النمو الأقتصادى يكون أكثر تأثرا بالسياسة النقدية كلما كانت مرونة الطاقة الأنتاجية مرتفعة. و تكون الأسعار أكثر تأثرا بالسياسة المالية و بسياسة أسعار الصرف إذا كانت مرونة الطاقة الأنتاجية منخفضة. و قد لعبت الأختلافات فى الهيكل الأقتصادى دورا هاما فى تحديد فاعلية الآثار الناجمة عن السياسة المالية و النقدية و سياسة أسعار الصرف. فمن ناحية تؤدى الأختلافات فى الهيكل الأقتصادى إلى الحد من فاعلية الآثار الناجمة عن السياسة المالية. و على النقيض، تؤدى هذه الأختلافات إلى زيادة فاعلية الآثار المترتبة على السياسة النقدية، و سياسة أسعار الصرف بدرجة أقل. و تتضح أهمية الآثار التى تترتب على هاتين السياستين فى تحديد مستوى الأسعار و معدلات تغيرها. و قد لعبت السياسة النقدية دورا هاما فى تحديد معدلات نمو الأنتاج من السلع و الخدمات فى العديد من بلدان الشرق الأوسط.

I Introduction

Over the past two decades, there has been a serious and growing concern for the problems and potentials of short-term macroeconomic stabilization policies in less developed countries (LDCs). The concern has been stimulated by observations of the extensive unemployment in LDCs and the need to get the massive supply of labor into employment. Early efforts to address the problem of economic development reflected a consensus that planners must worry about long-run growth in LDCs, not short-run stabilization (Rao, 1952). This consensus stalled efforts to adapt the growing Keynesian macroeconomic thinking to the problem of economic development. While short-run macroeconomic policies have been at the very heart of advanced country policy-making, the choice of long-run growth as the first priority led to the neglect of these policies in addressing the economic problems of LDCs. Instead, development efforts focused on enterepreneurial planning of micro-market failure in dealing with the excess capacity observed in LDCs. This, in turn, shifted attention away from stabilization policies in LDCs. Even when the need to stimulate demand appeared necessary to sustain economic growth, demand shortages were considered to be beyond the reach of stabilization policies in LDCs.

More recently, however, a growing attention has focused on the theoretical and econometric analysis of short-run macroeconomic policy in LDCs. The increased attention has been attributed to several factors: (i) first, is the continuous fluctuation in output and prices that has challenged the adequacy of long-run growth policies to deal with development problems, and (ii) second, are growing pressures, both internally and externally, that have been practiced on LDCs in order to adapt stabilization policies. The potential of stabilization policies in LDCs has focused attention on structural features that are necessary to maximize their stabilizing results. A large theoretical literature emerged in an effort to address the unique problems facing stabilization efforts in LDCs.[1]

The focus of this paper is on the success of stabilization policies across LDCs in the Middle East. A sample

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[1] Some have claimed that lags, rigidities, and the disequilibrium analysis are the essence of short-term LDCs macro understanding (for example, Behrman 1981 or Crockett 1981). Others have focused on a more elaborate analysis of structural differences between developing and developed countries. See Porter and Ranney (1982) for a summary of the theoretical literature. For more detailed references, see Behrman and Hanson (1979), Cline and Weintraub (1981), and Bruno (1979). For some empirical evidence on the success of stabilization policies in developing and developed countries, see Kandil (1992).

of countries is under investigation to provide a cross-country comparison that concerns structural differences determining the results of stabilization policies on economic performance. Based on data availability, the following countries are under investigation: Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Morocco, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, the Yemen Arab Republic, and the Yemen Domocratic Republic.[2] Sample periods range between 1955 and 1990 according to data availability. Three measures of stabilization policies are under consideration: the growth of the money supply, the growth of government spending and the devaluation of the domestic currency.

In an effort to evaluate the role of stabilization policies in the Middle East, empirical models that evaluate the real and inflationary effects of stabilization policies are estimated. These models approximate the reduced-form solutions in standard business-cycle macroeconomic models. Changes in government spending and the money supply are expected to play an important role in determining aggregate domestic demand across countries of the Middle East. In addition, the empirical models account for two other potential sources of cyclical fluctuations in the Middle East. Changes in the exchange rate are expected to affect the demand and supply-sides of the economy through their effects on exports and imports. In addition, changes in the oil price are expected to determine economic fluctuations in the oil-exporting and importing countries of the Middle East.

The real and inflationary effects of stabilization policies are likely to vary in response to demand and supply constraints. Underlying the size of demand shifts attributed to stabilization policies are structural parameters characterizing the demand side of the economy. On the other hand, supply-side constraints determine the allocation of demand shifts between real output growth and price inflaion. The empirical analysis will then investigate the role of supply-side and demand-side constraints in determining the real and inflationary effects of stabilization policies. The success of stabilization policies in determining economic performance will be evaluated in light of the empirical evidence concerning variations in policy variables and their effects on real output growth and price inflation across countries.

The remainder of the investigation is organized as follows. Section II provides summary statistics for major macroeconomic indicators across countries. Section III discusses the theoretical background for the

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[2]Yemen was reunited in 1991.

empirical analysis. Section IV provides basic estimates that characterize the demand and supply sides of the economies under investigation. Section V analyzes the real and inflationary effects of stabilization policies in the Middle East. The implications of the evidence to economic performance in the Middle East are analyzed in Section VI. Finally, a summary and conclusion are provided in Section VII.

II Macroeconomic Indicators in the Middle East

To motivate the empirical investigation of the paper, this section provides summary statistics for major macroeconomic indicators across the countries of the Middle East under investigation.[3] These indicators concern the determinants of economic performance, real output growth, price inflation and aggregate demand growth, as well as three traditional measures of stabilization policies, money growth, the growth of government spending and the change in the exchange rate. For each of the variables, the mean, the standard deviation, the minimum and maximum values are provided in Table 1. A brief summary of the indicators across countries is as follows.

Real output growth is measured by the first-difference of the log value of aggregate real output across countries. The highest average of real output growth is observed for the Yemen Arab Republic, 8.4% between 1969 and 1987, where the highest growth rate reached 21% in 1971 and the lowest growth rate was 3.3% in 1984. The lowest average of output growth is observed for Kuwait, -1.4% between 1970 and 1988, with a maximum value of 13% in 1979 and a minimum value (maximum contraction) of -23% in 1980.[4] The highest variability of output growth is observed for Iran, 0.13 between 1959 and 1988, which is consistent with the sharp difference between maximum output growth, 42% in 1974, and minimum growth (largest contraction), -25% in 1978.[5] The lowest variability of output growth is observed for Turkey, 0.029 between 1957 and 1988, where the maximum output growth reached 11% in 1966 and the lowest growth (highest contraction) was -2.9% in 1978.

Price inflation is measured by the first-difference of the log value of the aggregate price level across

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[3] Description and sources of the data are provided in the appendix.

[4] Fluctuations in output growth for Kuwait may be attributed to changes in the export price of oil determining oil production.

[5] Several factors may be relevant to these fluctuations: the volatility of the export price of oil, the Iranian revolution and the war between Iran and Iraq.

countries. The highest average of price inflation is observed for Turkey, 21% between 1955 and 1989, where the highest inflation rate reached 74% in 1980 and the lowest inflation rate was 0% in 1961. The lowest average inflation rate is for Tunisia, 5.8% between 1955 and 1990, where the highest inflation rate reached 13% in 1957 and the lowest inflation rate was actually negative (deflation), -4.1% in 1962. The largest variability of price inflation is observed for Saudi Arabia, 0.27 between 1968 and 1989, where the maximum inflation rate reached 89% in 1974 and the lowest inflation rate (largest deflation) was -25% in 1982.[6] The lowest variability of price inflation is observed for Algeria, 0.034 between 1969 and 1988, where the highest inflation rate reached 16% in 1978 and the lowest rate was 2.7% in 1971.

Aggregate demand growth is measured by the change in the log value of nominal GNP/GDP across countries. The highest average demand growth is observed for Turkey, 25% between 1955 and 1988, where the highest growth reached 70% in 1980 and the lowest growth was 5.8% in 1961. This appears to be consistent with the continuous escalation of price inflation over time. The lowest average demand growth is observed for Morocco, 9.9% between 1955 and 1988, where the highest growth reached 31% in 1974 and the lowest growth (largest contraction), -2.8% in 1966. The highest variability of aggregate demand growth is observed for Saudi Arabia, 0.30 between 1967 and 1983, where the highest demand growth reached 100% in 1973 and the lowest growth (largest contraction) -18% in 1982. This appears consistent with the high variability of price inflation in Saudi Arabia. The lowest variability of demand growth is observed for Tunisia, 0.055 between 1960 and 1990, where the maximum demand growth was 27% in 1974 and the lowest growth was 1.4% in 1962.

The growth of the money supply is measured by the first-difference of the nominal value of the money stock. The highest average growth of the money supply is observed for Turkey and the Yemen Arab Republic. For Turkey, the average growth of the money supply is 25% between 1960 and 1989 where the highest growth reached 53% in 1989 and the lowest growth was 5.6% in 1958. For the Yemen Arab Republic, the average growth of the money supply is also 25% between 1973 and 1989 with a maximum growth of 77% in 1976 and a minimum growth of 2.6% in 1988. The highest variability of monetary growth is observed for Kuwait, 0.30

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[6] These fluctuations may be attributed to the volatility of the export price of oil, which determined income and, in turn, purchasing power.

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between 1960 and 1989, where the maximum growth reached 137% in 1962 and the lowest growth (largest contraction) reached -20% in 1984. The lowest variability of monetary growth is observed for Morocco, 0.11 between 1958 and 1990, where the maximum growth reached 24% in 1974 and the lowest growth (largest contraction) was -0.32% in 1966.

The growth in government spending is measured by the log first-difference of government purchases of goods and services. The highest average growth of government spending is also observed for Turkey, 25% between 1955 and 1987, where the highest growth reached 67% in 1981 and the lowest growth reached 4.1% in 1960. The lowest average growth of government spending is for Jordan, 10% between 1959 and 1989, where the highest growth reached 35% in 1976 and the lowest growth (largest contraction) was -8.6% in 1970. The highest variability of government spending is observed for Saudi Arabia, 0.22 between 1969 and 1989, where the highest growth reached 61% in 1973 and the lowest growth (largest contraction) reached -10% in 1988. The lowest variability of government spending is observed for Tunisia, 0.055 between 1960 and 1990, where the maximum growth reached 25% in 1982 and the lowest growth was 1.4% in 1962.

The change in the exchange rate is measured by the log first-difference of the domestic currency price of Special Drawing Rights (SDRs). An increase in this price is consistent with a devaluation of the domestic currency. The largest average devaluation of domestic currency was observed for Turkey, 21% between 1955 and 1990, where maximum devaluation reached 98% in 1958 with several periods of stable currency where devaluation was determined by 0%. The lowest average devaluation of domestic currency was observed for Kuwait .21%, where the maximum devaluation reached 12% in 1986 and the lowest devaluation was -5.3% in 1981, an appreciation of the domestic currency. The highest variability of the exchange rate is observed for Turkey, 0.25 between 1955 and 1990. And the lowest variability of the exchange rate is observed for Jordan, 0.015 between 1955 and 1990, where the maximum devaluation reached 8.3% in 1971 and the lowest devaluation was -2.8% in 1974, an appreciation of the domestic currency.

III Theoretical Background

To approximate reduced-form solutions of real output growth and price inflation in standard macro models, consider the following relationships:

$$Dy = \alpha_y Dngnp \tag{1}$$

$$Dp = \alpha_p Dngnp \tag{2}$$

Here, D(.) is the first-difference operator. The log of real output is denoted by y and the log of the price level is denoted by p. Aggregate demand is approximated by nominal GNP/GDP, $ngnp$. Aggregate demand growth is distributed between real output growth, Dy, and price inflation, Dp, with shares that are approximated by α_y and α_p, respectively. These shares are determined by the slope of the aggregate supply curve. Underlying this slope are constraints on the supply side of the economy that determine the ability to vary the output produced in response to aggregate demand shifts. These are capacity constraints that capture the effects of resource availability and elasticities characterizing the labor market and the production function for the specific economy. The larger these constraints are, the steeper the aggregate supply curve, i.e., smaller real effects, α_y, and larger inflationary effects of a change in aggregate demand.

Underlying aggregate demand shifts, $Dngnp$, are specific demand shocks that include the effects of stabilization policies on aggregate demand. These effects can be approximated as follows:

$$Dngnp = \beta_m Dmoney + \beta_g Dgov + \beta_x Dex \tag{3}$$

Policy variables are measured by the log values of the money stock, $money$, government spending, gov, and the domestic currency price of SDRs, ex. An increase in monetary growth increases the availability of credit for spending which is stimulating of aggregate demand, i.e., β_m is positive. Similarly, an increase in government spending may be stimulating of aggregate demand in two directions: an increase in government's purchases of goods and services and an increase in subsidies to finance private spending. That is, β_g is positive. A devaluation of the domestic currency in LDCs is expected to affect aggregate demand as follows.[7]

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[7]The effects of devaluation in LDCs are expected to vary from the standard implications for advanced countries. For more details, see Porter and Ranney (1982).

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Devaluation policy is likely to increase exports and curb imports which is stimulating of aggregate demand. Further, devaluation increases real expenditures on imported variable inputs. This, in turn, induces firms to demand more money and decreases investment demand. Thus, the effect of devaluation policy on aggregate demand is uncertain. If the former channel dominates, β_x is expected to be positive. The parameters β_m, β_g and β_x approximate, therefore, the size of aggregate demand shifts attributed to monetary, fiscal and devaluation policies.

Substituting equation (3) into (1) and (2) results the following:

$$Dy = \alpha_y \{\beta_m Dmoney + \beta_g Dgov + \beta_x Dex\} \tag{4}$$

$$Dp = \alpha_p \{\beta_m Dmoney + \beta_g Dgov + \beta_x Dex\} \tag{5}$$

which can be rewritten as:

$$Dy = \gamma_{my} Dmoney + \gamma_{gy} Dgov + \gamma_{xy} Dex \tag{6}$$

$$Dp = \gamma_{mp} Dmoney + \gamma_{gp} Dgov + \gamma_{xp} Dex \tag{7}$$

where $\gamma_{iy} = \alpha_y \beta_i$ and $\gamma_{ip} = \alpha_p \beta_i$, $i = m, g, x$. That is, the effects of stabilization policies on output growth and price inflation are determined by two factors: (i) constraints on the supply-side that determine the real and inflationary effects of a given shift in aggregate demand, α_y and α_p, and (ii) the success of the policy change in stimulating aggregate spending and, in turn, determining aggregate demand shifts, β_i.

The size of demand shifts attributed to stabilization policies, β_i, are dependent, in turn, on structural parameters underlying the demand side of the economy.[8] These parameters characterize behavorial equations underlying the demand side of the economy as follows:

$$con = \bar{c} + c'y, \quad c' > 0 \tag{8}$$

$$inv = \bar{i} + i'_y y + i'_r r, \quad i'_y > 0, \quad i'_r < 0 \tag{9}$$

$$imp = \bar{o} + o'y, \quad o' > 0 \tag{10}$$

$$md = \bar{m} + k'y + l'n, \quad k' > 0, \quad l' < 0 \tag{11}$$

[8]For more details on the theoretical arguments underlying these relationships, see Kandil (1991).

Real income is denoted by y. Consumption demand, con, varies positively with income where c' measures the marginal propensity to consume out of income. Similarly, inv denotes investment demand where i'_y measures the marginal propensity to invest out of income. Further, investment demand varies negatively with the real interest rate, r, where i'_r measures the interest sensitivity of investment demand. The demand for imports is denoted by imp where o' measures the marginal propensity to import out of income. The demand for real money balances is denoted by md where k' and l' measure the sensitivity of money demand to real income and the nominal interest rate, n. Finally, $\bar{c}$, $\bar{i}$, $\bar{o}$, and $\bar{m}$ denote autonomous demand.

The size of the demand shift attributed to a given underlying policy change is likely to depend on the marginal propensity to spend. A larger propensity to consume, c', and invest, i'_y, accelerate induced spending in response to changes in income. In contrast, an increase in the marginal propensity to import, o' moderates the effects of a given policy change on aggregate demand. This is because imports decrease the propensity to spend on domestic output and moderate demand growth in response to changes in income.

On the other hand, the effect of stabilization policies on aggregate demand is likely to depend on conditions in the money market that feed back into the goods market through the interest rate. This determines the change in investment demand accompanying stabilization policies. The change in investment demand may reinforce or moderate the effect of stabilization policies on aggregate demand. Structural parameters determining this channel are as follows.

Changes in the interest rate are dependent on the interest sensitivity of money demand. The more responsive money demand is to a change in the interest rate, $|l'|$ is larger, the smaller the necessary adjustment of the interest rate to equilibrate the money market. This moderates the reduction in the interest rate accompanying an increase in monetary growth and reduces the effectiveness of monetary policy in stimulating investment demand. Consequently, the size of demand shifts in response to monetary growth is smaller. In contrast, a smaller adjustment of the interest rate, reduces the crowding out effect on investment demand following an increase in government spending or a devaluation of the domestic currency. This is consistent with a larger shift of aggregate demand in response to fiscal and devaluation policies.

Consistently, the interest sensitivity of investment demand is likely to differentiate the size of demand

shifts attributed to stabilization policies. An increase in the interest sensitivity of investment demand, large $|i_r'|$, stimulates investment demand in response to an increase in the money supply and exacerbates the policy effect on aggregate demand. In contrast, a larger interest sensitivity of investment demand increases the crowding out effect which moderates the size of aggregate demand shifts attributed to fiscal and devaluation policies.

Finally, the effect of the various measures of stabilization policies on aggregate demand is dependent on the income sensitivity of money demand. The more responsive money demand is to a change in income, large k', the bigger the change in money demand accompanying stabilization policies. The increased money demand increases the real interest rate and crowds out investment demand. Therefore, a larger income sensitivity of money demand decreases the size of aggregate demand shifts attributed to monetary, fiscal and devaluation policies.

IV   Empirical Analysis

The analysis of this section summarizes the evidence on demand and supply-side constraints that are likely to differentiate the real and inflationary effects of stabilization policies across countries of the Middle East.[9]

IV-A   Demand-Side Structural Parameters

To identify parameters underlying the demand side of the economy, equations (8) through (11) are estimated jointly using 3SLS.[10] The data for estimation are described in the appendix where the real interest rate is measured by the nominal interest rate minus ex post price inflation.[11] The estimates of structural parameters are summarized in Table 2 where data are available. A summary of the evidence is as follows.

The average marginal propensity to consume is 0.58 across countries with a minimum of 0.18 in Kuwait

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[9] For the remainder of the empirical analysis, the evidence will be judged as statistically significant if significant at the five or ten percent levels.

[10] The model consists of six endogneous variables: con, inv, imp, md, y, n, and r. Three equilibrium conditions are added to estimate the model. These are the equilibrium conditions for the money and goods markets and the ex post real interest rate. Where serial correlation presented a problem, the behavioral equation is transformed to filter the error term prior to estimation.

[11] In theory, the real interest rate equals nominal interest rate minus expected inflation. Empirically, expected inflation is approximated by the ex post inflation rate, the first-difference of the log of the price level. This is in contrast to the ex ante inflation rate that is called for in theory. As Mishkin (1992, p. 88) suggests, the real interest rate that is most important to economic decisions is the "ex ante real interest rate" because it is adjusted for expected changes in the price level. The " ex post real interest rate", the interest rate which is adjusted for actual changes in the price level, describes how well a lender has done in real terms after the fact.

and a maximum of 0.77 in Jordan.[12] The average marginal propensity to invest is 0.27 across countries

with a minimum of 0.042 in Kuwait and a maximum of 0.40 in Tunisia.[13] The average marginal propensity

to import is 0.34 across countries with a minimum of 0.11 in Algeria and a maximum of 0.65 in Jordan.[14]

The average response of money demand to income is 0.26 with a minimum response of 0.44 in Morocco and

a maximum response of 0.56 in Syria. The interest sensitivity of investment demand is generally negative

across countries and statistically significant in two cases only.[15] Finally, the limited fluctuation in the market

interest rate has limited its ability to determine the opportunity cost of holding money for many countries.[16]

The response of money demand to the interest rate is negative and statistically significant in Morocco and

Turkey only.

IV-B Supply-Side Constraints and the Output-Inflation Tradeoff

To identify constraints on the supply side determining the output-inflation tradeoff, empirical models that

approximate the relationships (1) and (2) are estimated as follows:[17]

$$Dy = \alpha_{0y} + \alpha_{1y}Dyl1 + \alpha_{2y}Dngnp + \alpha_{3y}Doilp + \epsilon_y \tag{12}$$

$$Dp = \alpha_{0p} + \alpha_{1p}Dpl1 + \alpha_{2p}Dngnp + \alpha_{3p}Doilp + \epsilon_p \tag{13}$$

Here, α_{0y} and α_{0p} are constants. The trend components of the logarithms of real output, y, and the price

level, p, are modelled as stochastic functions of time following the suggestions of Nelson and Plosser (1982).

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[12]Variations in the marginal propensity to consume suggest a large overall marginal propensity to consume in low income countries, as suggested by Behrman and Hanson (1979) and Leff and Sato (1980).

[13]The possibly high income elasticity of investment demand in LDCs was suggested by earlier empirical studies (Leff and Sato, 1980).

[14]As Porter and Ranney (1982) suggest, imports and domestically produced goods are very poor substitutes in LDCs. Thus, the income elasticity of import demand is expected to be high in LDCs.

[15]The small interest sensitivity of investment demand in LDCs is among the stylized facts that are well documented in the theoretical literature analyzing the economies of LDCs. The self-financing of investment is prevalent in LDCs (Goldsmith, 1969), and capital investment is usually financed through the direct lending from the government or through retained earnings of business firms (Porter and Ranney, 1982). Further, in LDCs a curb market exists for financial transactions and the curb rates are of a significant impact on private investment spending. Curb rates are often in sharp contrast to the government's published data of the interest rate (see, for example, McKinnon, 1973, and Ayre, 1977).

[16]For many of the countries for which interest rate data are available, the interest rate is administered which reduces its possible effects on variables, as predicted by theory. Further, the existence of a curb market for financial transactions questions the reliability of the published data for the interest rate in LDCs in reflecting important changes in the market interest rate that guide decisions. This is a basic source of difference in the macroeconomic analysis of advanced and less developed economies. For more details on the dramatic difference in the structure and activities of the markets for financial assets, see Patrik (1966), Goldsmith (1969), Coats and Khatkhate (1980), Fry (1982) and Khatkhate (1982).

[17]The empirical models are consistent with the reduced form solutions of real output and price in standard macroeconomic models. A modification that decomposes the change in demand and supply shifts into anticipated and unanticipated was estimated for some countries according to data availability. The paper's findings are robust with respect to this modification.

This requires estimating the models in first-difference forms where D(.) is the first-difference operator.[18] To

account for possible persistence, the lagged values of output growth and price inflation, $Dy/1$ and $Dp/1$ are

included in the empirical models.[19] The parameters α_{1y} and α_{1p} approximate the degree of persistence.[20]

The closer these parameters are to one, the more persistent are movements in real output growth and price

inflation. As explained above, α_{2y} and α_{2p} approximate the allocation of aggregate demand shifts between

real output growth and price inflation. In addition, the empirical models account for an important source

of supply-side shifts, the change in the oil price, $Doilp$.[21] The effects of oil on price inflation and output

growth are likely to vary across the oil importing and oil-exporting countries of the Middle East.[22] Finally,

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[18]The traditional approach to dealing with non-stationarity is to either remove a linear time trend from the original time series, producing a detrended series to use in its place, or equivalently, to include time as a regressor in the model. However, in an influential paper, Nelson and Plosser (1982) report strong evidence that suggests real activity and the price level are more appropriately modelled as difference stationary processes than as trend-stationary processes. The results of the tests employed by Nelson and Plosser confirm their findings in the context of this cross-country investigation. The procedure of the test involves the hypotheses of a trend-stationary and a difference-stationary in a common model. Among the simpler alternatives are a trend stationary process with first-order autoregressive deviations and a random walk difference stationary process. Thus, a regression of the following form is estimated:

$$y_t = \mu + \gamma t + \lambda_1 y_{t-1} + \sum_{j=2}^{k} \lambda_j (y_{t-j+1} - y_{t-j})$$

and the null hypothesis that $\lambda_1 = 1$ is tested. To specify the maximum lag k, the values that would be suggested by the autocorrelation of first-differences and by the partial autocorrelation of the deviations from trend are considered. For the various real output series under investigation, the values of λ_1 range from a low of 0.39 to a high of 1.00. For the price series, the values of λ range from a low of 0.54 to a high of 1.00. Dickey (1976) and Fuller (1976) develop the limiting distribution of λ_1 and the conventionally calculated least square t-statistic, denoted τ, for the null hypothesis $\lambda = 1$, and tabulate the distribution. These tabulations indicate that none of the real output and price series under investigation exhibited a value of $\tau(\lambda)$ below the 0.05 critical value of -3.60. Therefore, the hypotheses that these series have unitary roots cannot be rejected.

[19]The presence of the lagged dependent variables is attributed to adjustment costs. If firms find it costly to adjust input levels, there will be lags in the response of real output to its determinants. These lags might be attributed to accelerated effects from capital accumulation (Lucas 1975), inventory dynamics (Haraf 1979) or costs of adjusting output rates toward desired levels. In addition, wage rigidity (see, e.g., Gray and Kandil (1991)) is also expected to contribute to a higher persistence of real output. This persistence suggests that the response of real output to cyclical sources is prolonged. That is, it takes real output a longer time to adjust back towards its full equilibrium value following a shock at time t. Such persistence will result in a large value of the parameter measuring the response of real output to its lag. Persistence in the price adjustment may be attributed to wage rigidity (see, e.g., Gray and Kandil (1991)) or small menu costs involved in price changes (see, e.g., Ball, Mankiw and Romer (1988)). These are the costs of changing price lists, informing customers and posting new prices. If these costs are large, firms may be reluctant to change prices frequently in response to cyclical fluctuations. Price persistence will result in a large value of the parameter measuring the response of price to its lag. Alternatively, one can estimate a distributed lag model to trace the effects of cyclical shifts on output growth and price inflation over time. Given the number of explanatory variables in the output and price models, the more restrictive approach, including a lagged dependent variable in the models is more plausible.

[20]Negative α_{1y} and α_{1p} would counter the argument for persistence. That is, fluctuations tend to revert themselves from one period to the next.

[21]Supply-side shifts may be correlated with the growth in nominal GNP/GDP. Omitting the change in the oil price may bias, therefore, the response of real output and price to nominal GNP shifts. The direction of the bias may vary across countries depending on the correlation between nominal GNP/GDP and the oil price.

[22]As explained in the data appendix, the oil price is measured by the export price of crude oil for Kuwait. This approximates the international price of oil that is expected to be highly correlated with domestic oil prices, especially for oil importing countries. For oil exporting countries, the export price of oil is used in estimation where data are available.

ϵ_y and ϵ_p are unexplained error terms.

Data for the estimation of models (12) and (13) are summarized in the Appendix. The empirical models are estimated using 2SLS after transformation to filter the error term for possible first-order serial correlation.[23] Estimates are summarized in Table 3.

Across countries, the average response of real output growth to aggregate demand growth, α_{2y}, is 0.44 with a standard deviation of 0.36. The maximum response is observed for Sudan, 0.91, and the lowest response is observed for Egypt, -0.15. The average inflationary effect of demand growth, α_{2p}, is 0.36 across countries with a standard deviation of 0.34. The maximum inflationary effect of demand growth is observed for Turkey, 1.077, and the minimum effect for Kuwait, -0.081.[24]

The most interesting aspect of the evidence in Table 3 concerns the allocation of aggregate demand shifts between real output growth and price inflation.[25] The larger the share of price inflation, the more flexible prices are in response to aggregate demand shifts and the steeper the economy's supply curve. In these cases, capacity constraints limit the output adjustment in response to aggregate demand shifts requiring a bigger adjustment of price inflation to curb demand fluctuations. In contrast, the larger the share of real output growth of aggregate demand shifts, the less binding are capacity constraints. Judged by statistical significance, the inflationary effects of aggregate demand shifts appear more dominant for Bahrain, Egypt, Iran, Saudi Arabia, Syria and Turkey. In contrast, the real effects of aggregate demand shifts appear more dominant according to the statistically significant evidence for Jordan, Kuwait, Sudan, and Tunisia. While

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[23]Nominal GNP/GDP growth is endogenous according to the results of the endogeneity test suggested by Engle (1982). To account for this endogeneity, the empirical model is estimated using 2SLS. The list of instrumental variables includes two lags of the log value of real output, the price level, the money supply, government spending, the exchange rate, and the oil price. The results of Engle's (1982) test for serial correlation present evidence of first-order autoregressive errors for some countries. To maintain comparability across countries, it is assumed in all cases that the errors of the output and price equations follow an AR(1) process. The estimated models are transformed to eliminate serial correlation. The estimated residuals from the transformed models have zero means and are serially independent.

[24]The evidence appears consistent with major explanations of business-cycle theories. The equilibrium story pioneered by Lucas (1973) suggests that in economies that are characterized with a history of high demand variability, agents are less likely to interpret "noise" as indicative of changes in demand- the result will be a steeper supply schedule and a nearly vertical Phillips curve. The contractual wage rigidity explanation of business cycles (see, e.g., Gray and Kandil (1991)) suggests that wages are more flexible in response to demand shifts the higher the demand uncertainty. More flexible wages are consistent with a steeper supply schedule. Similarly, the sticky price explanation of business cycles (see, e.g., Ball, Mankiw and Romer (1988)) advocates that prices are more flexible the higher the uncertainty about demand shifts. More flexible prices are consistent with a steeper supply schedule. Among the countries under investigation, Turkey is characterized by the highest average demand growth and a history of high inflation. This is consistent with high uncertainty about frequent demand shifts and price level changes in Turkey. Consistently, the aggregate supply curve in Turkey appears the steepest among the countries under investigation.

[25]The GNP/GDP deflator is not available to measure the aggregate price level. Instead, the price level is measured by the Consumer Price Index for many countries (see data appendix). Accordingly, α_{2y} and α_{2p} do not necessarily add up to one.

demand shifts are statistically significant in determining real output growth in Algeria, Iran, and Morocco, the accompanying inflationary effects appear also important, i.e., statistically significant.

On the other hand, the real and inflationary effects of the change in the oil price have also varied across countries. Where oil is an important input in the production function, an increase in the oil price is expected to increase the cost of the output supplied which is contractionary of the output produced and inflationary of the price level. These predictions are consistent with the observed statistically significant effects for Jordan, Kuwait, Morocco, and Saudi Arabia. Surprisingly, the contractionary effects of the increase in the oil price included two of the major oil-exporting countries in the region: Saudi Arabia and Kuwait. The rise in the oil price may be consistent with a shift of resources from the non-oil sectors to the oil sector of the economy where the contractionary effects on the former appear dominant. Further, higher wages in the oil-producing sector may have had spill-over inflationary effects that escalated the inflationary effects of a rise in the oil price in major oil-exporting countries. In contrast, an increase in the oil price is correlated with a reduction in price inflation for Algeria, Bahrain, and Turkey. And, an increase in the oil price has a statistically significant expansionary effect on output growth in Algeria, an oil-producing country.

V   Stabilization Policies in the Middle East

The empirical analysis of this section concerns the effects of stabilization policies on output growth and price inflation across countries under investigation. There are two factors to consider: the size of demand shifts attributed to a given policy change and the effects on price inflation and output growth.

V-A   Stabilization Policies and Aggregate Demand

To measure demand shifts in response to stabilization policies, an empirical model that replicates the relationship in (3) is estimated. The data for estimation are described in the appendix. The model is estimated using 2SLS after transformation to filter the error term for possible first-order serial correlation.[26] The results are summarized in Table 4.

Among stabilization policies under consideration, demand shifts attributed to government spending are

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[26] The endogeneity of policy variables is tested following the suggestions of Engle (1982). Where the policy change appears endogenous, instrumental variables are used.

the largest in Algeria, Iran, Kuwait, Saudi Arabia, Syria, and the Yemen Arab Republic. Except for the latter two countries, this sample comprises oil-producing countries. The evidence is consistent with aggressive fiscal policies pursued by the governments of these countries to stimulate their economies. Among stabilization policies under consideration, monetary policy has the largest effect on the growth of aggregate demand in Bahrain, Egypt, Jordan, Morocco, Sudan, Tunisia, and Turkey. It appears, therefore, that monetary growth is an important element of financing the increased spending and stimulating demand in these countries. Devaluation policies appeared to be generally less important to demand growth across countries. Further, devaluation policies are contractionary of aggregate demand in some countries. Despite aggressive devaluation policies pursued by countries of the Middle East (see Table 1), the success of these policies in stimulating exports and, therefore, aggregate demand appears relatively small compared to monetary and fiscal policies.

Correlations among policy variables are also presented in Table 3. The correlation between changes in government spending and the money supply is positive across countries ranging from a low of 0.18 for Iran to a high of 0.69 for Turkey. Monetary growth is used to finance the increase in government spending across many countries in the Middle East. Except for Iran, Sudan, and Turkey, the correlation between devaluation policy and monetary policy is negative across countries ranging from -0.023 for Egypt to -0.50 for Algeria. Devaluation policies may be pursued as an alternative to the acceleration of the money supply to finance the increased spending. This argument appears also consistent with the correlation between the increased government spending and devaluation. Except for Algeria, Iran, Tunisia, and Turkey, this correlation is negative across countries ranging from -0.016 for Syria to -0.47 for Bahrain. The substitutability between devaluation policies and domestic stabilization policies may have been induced, at least in part by pressures from international organizations (precisely, the International Monetary Fund and the World Bank) on governments in the Middle East to move towards market oriented measures: devalue their currency, decrease subsidies and government's involvement in business, and decrease the growth of the money supply.

In an attempt to explain the observed differences in aggregate demand shifts in response to stabilization policies, the structural parameters characterizing the demand side of the economy (where available in Table

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2) are avaluated. An increase in the marginal propensity to consume is expected to increase the response of aggregate demand to stabilization policies. The correlation between the marginal propensity to consume and the size of demand shifts in response to monetary, fiscal and devaluation policies is 0.75, -0.89, and 0.040, respectively. It appears, therefore, that monetary growth is an important factor in financing the increased spending on private consumption where the marginal propensity to consume is larger across countries. In contrast, the larger the marginal propensity to consume, the smaller the effects of government spending on aggregate demand across countries.[27] Government spending and private spending compete for limited available resources. A reduction in the contribution of the public sector to aggregate spending is, therefore, necessary as the propensity to consume increases across countries of the Middle East.[28] Finally, the correlation between the marginal propensity to consume and demand shifts in response to devaluation, although positive, is very small.

An increase in the marginal propensity to invest is also expected to increase the response of aggregate demand to stabilization policies. The correlation between the propensity to invest out of income and aggregate demand shifts in response to monetary, fiscal and devaluation policies is 0.74, -0.82, and -0.38, respectively. Monetary growth appears to be an important factor in financing spending on private investment where the marginal propensity to invest is larger across countries. Further, the negative correlation supports the substitutability between government spending and private spending on investment. A higher marginal propensity to invest is also negatively correlated with the effectiveness of devaluation in stimulating domestic demand. Investment stimulates demand for capital goods and advanced technology which may interfere with the effectiveness of devaluation to curb imports in the absence of readily available domestic substitutes.

An increase in the marginal propensity to import is expected to decrease the response of aggregate demand to stabilization policies. The correlation between the marginal propensity to import and aggregate demand shifts in response to monetary, fiscal and devaluation policies is 0.24, -0.51 and 0.27, respectively. The positive correlations are interpreted as follows. Where the marginal propensity to import is larger, monetary growth is

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[27] Recall that the effects of government spending on aggregate demand are particularly important in oil-exporting countries.

[28] This evidence remains robust with respect to a modification that excludes Kuwait from the sample. The marginal propensity to consume out of income is the smallest in Kuwait and the demand shift attributed to government spending is the largest. This observation does not appear, however, to drive the results under consideration.

important in financing the increased spending. Further, devaluation policies are more aggressively pursued to curb imports where the marginal propensity to import is large. In contrast, the negative correlation suggests that the effect of government spending on demand shifts is larger across countries where the marginal propensity to import is smaller. This provides further evidence on the importance of public spending in stimulating aggregate demand where private spending, on domestic as well as foreign goods, does not appear adequate to stimulate economic growth.

A higher response of investment demand to the interest rate (a smaller negative parameter), is expected to exacerbate the effects of monetary policy on aggregate demand. That is, the size of demand shifts in response to monetary policy is expected to be negatively correlated with the interest sensitivity of investment demand. The empirical estimate supports the direction of this correlation: -0.14. In contrast, the more responsive investment demand to the interest rate (a smaller negative parameter), the bigger the crowding out effect and the smaller the effect of fiscal and devaluation policies on aggregate demand. That is, demand shifts in response to fiscal and devaluation policies are expected to be positively correlated with the interest sensitivity of investment demand. The empirical estimates support the direction of these correlations: 0.12, and 0.53, respectively.

Similarly, the effectiveness of monetary policy is dependent on a small interest sensitivity of money demand (a larger negative parameter). That is, demand shifts in response to monetary policy are expected to be positively correlated with the interest sensitivity of money demand. The empirical estimate does not support the direction of this correlation: -0.057. In contrast, a small interest sensitivity of money demand (a larger negative parameter) increases the crowding out effect which decreases the effectiveness of fiscal and devaluation policies. That is, demand shifts in response to fiscal and devaluation policies are expected to be negatively correlated with the response of money demand to the interest rate. The empirical estimates support these predictions: -0.37 and -0.31, respectively.

Finally, the more responsive money demand is to income change (a larger positive parameter), the larger the crowding out effect and the smaller the effects of monetary, fiscal, and devaluation policies on aggregate demand. The empirical estimates support the direction of these correlations in two cases: -0.068, -0.16, and

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0.093, respectively.

All in all, the magnitude and statistical significance of the above mentioned correlations point to the importance of the increased private propensity to spend to the size of demand shifts attributed to monetary policy in the Middle East. In contrast, fiscal policy in the form of government spending is more important to aggregate demand shifts where the private propensity to spend out of income is small in the Middle East.

V-B   The Real and Inflationary Effects of Stabilization Policies

Given the evidence on the size of demand shifts attributed to stabilization policies, what are the varying effects of these policies on real output growth and price inflation? To answer, the empirical models in (12) and (13) are reestimated with a modification that replaces aggregate demand shifts with the change in policy variables underlying these shifts: monetary policy, *Dmoney*, fiscal policy, *Dgov*, and devaluation policy, *Dex*. The results are summarized in Table 5 where the parameters γ_{mi}, γ_{gi}, and γ_{xi} for $i = y$ and p measure the real and inflationary effects of stabilization policies. A summary of these effects is as follows.

Monetary growth has statistically significant real expansionary effects on output growth in Algeria, Tunisia, and the Yemen Arab Republic. In other cases, monetary growth appears ineffective in stimulating real output growth except in Bahrain and Egypt where the increase in monetary growth is correlated with contractionary effects on real output growth. Despite the expansionary effects of monetary growth on aggregate demand in these two cases (see Table 4), capacity limitations have not been able to cope with the increased demand which proved to be inflationary as seen in Table 3.

The inflationary effects of monetary growth are statistically significant for Jordan, Sudan, and Turkey. In other cases, the effects of monetary growth on price inflation appear generally insignificant except in Algeria and Iran where monetary growth appears correlated with a deceleration of price inflation. Despite the expansionary effects of monetary growth on aggregate demand in these two cases (see Table 4), the increased demand has been mostly absorbed in real output growth as seen in Table 3.

The real expansionary effects of an increase in government spending are supported by the statistically significant results for Morocco, and Syria only. In other cases, the increase in government spending is not

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significant in determining real output growth except for Bahrain where the effect appears contractionary.[29] The effect of government spending on aggregate demand is not statistically significant for Bahrain in Table 4. Further, the aggregate supply curve for Bahrain appears very steep in the face of aggregate demand shifts in Table 3.

The inflationary effect of an increase in government spending is statistically significant for Algeria, Kuwait, Tunisia, and Turkey. In other cases, the increase in government spending is not significant on price inflation except for Jordan where an increase in government spending appears to be correlated with a deceleration in price inflation. Despite the pronounced effects of an increase in government spending on aggregate demand in Jordan (see Table 4), the ability to expand the output produced in the face of aggregate demand shifts (see Table 3) has moderated the inflationary effects of fiscal policy.

Devaluation policies are intended to stimulate demand by increasing exports and decreasing imports. It is possible, however, that the rise in the domestic price of foreign currency has negative effects on aggregate demand. That is because more expensive imported variable inputs induce firms to demand more money and decrease investment spending. In addition, the increase in variable costs may prove contractionary of the output produced in the absence of readily available domestic substitutes that are necessary for production. Thus, the real and inflationary effects of devaluation in LDCs are uncertain. If the expansionary effects on the output demanded dominate, real output growth is likely to increase following a devaluation of the domestic currency. The empirical evidence is in sharp contrast. The effects of devaluation on real output growth is contractionary and statistically significant for Bahrain, Sudan, Tunisia, and Turkey. And the inflationary effects of devaluation are supported by the statistical significance for Syria, Turkey, and the Yemen Arab Republic. Devaluation appears, however, deflationary in Egypt, Jordan, and Morocco. The expansionary effects of devaluation on aggregate demand, although statistically significant at the ten percent level for Egypt and Morocco (see Table 4), are not strong to accelerate inflation in these countries.

To evaluate the contribution of supply-side and demand-side constraints in determining the real and inflationary effects of stabilization policies across countries, correlation measures are calculated. The cor-

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[29] While the increase in fiscal spending shifts the aggregate demand curve to the right in LDCs, the accompanying rise in the interest rate is expected to have a negative effect on the output supplied. If the latter dominates, an increase in government spending may be contractionary of real output. For more details, see Porter and Ranney (1982).

relation between the real effect of stabilization policy, ($\gamma_{iy}, i = m, g$, or x in Table 5) and the real effect of aggregate demand shifts (α_{2y} in Table 3) measures the importance of capacity constraints (supply-side constraints) in determinining the real effect of stabilization policies across countries. And, the correlation between the real effect of stabilization policy, γ_{iy}, and the size of demand shifts attributed to a given policy ($\beta_i, i = m, g$, or x in Table 4) measures the importance of demand-side constraints in determining the real effects of stabilization policies across countries. Similarly, the correlation between the inflationary effect of stabilization policy (γ_{ip}, $i = m, g$, or x in Table 5) and the inflationary effect of aggregate demand shifts (α_{2p} in Table 3) measures the importance of supply-side constraints to the inflationary effects of stabilization policies. And, the correlation between the inflationary effects of stabilization policy, γ_{ip}, and the size of demand shifts attributed to a given policy ($\beta_i, i = m, g, or$ x in Table 4) measures the importance of demand-side constraints to the inflationary effects of stabilization policies across countries.

Supply-side constraints dominate demand-side constraints in determining the <u>real</u> effects of monetary policy across countries. The correlation between α_{2y} and γ_{my} is 0.41 across countries and the correlation between β_m and γ_{my} is 0.33 across countries. That is, capacity constraints are more important compared to the size of demand shifts in differentiating the effects of monetary policy on real output growth across countries. The impacts of demand and supply-side constraints on the inflationary effects of monetary growth appear pronouncedly smaller. The correlation between α_{2p} and γ_{mp} is 0.084 and the correlation between β_m and γ_{mp} is 0.05 across countries. It appears, therefore, that supply-side and demand-side constraints are more important in differentiating the real effects of monetary policy across countries.

Supply-side constraints dominate demand-side constraints in determining the <u>inflationary</u> effects of the change in government spending across countries. The correlation between α_{2p} and γ_{gp} is 0.47 across countries. This is in contrast to a small negative correlation, -0.19, between β_g and γ_{gp}. The difference between supply-side constraints and demand-side constraints appears less pronounced in differentiating the real effects of government spending across countries. The correlation between α_{2y} and γ_{gy} is 0.17 and the correlation between α_{2y} and β_g is also 0.17. In contrast to the evidence for monetary policy, capacity constraints appear more important to the difference in the inflationary effects of government spending across countries of the

Middle East.

Correlation measures highlight also the importance of supply-side constraints in differentiating the inflationary effects of devaluation policies across countries. The correlation between α_{2p} and γ_{xp} is 0.54 across countries. This is in contrast to demand-side constraints that appear pronouncedly less important to the difference in the inflationary effects of devaluation policy across countries. The correlation between β_x and γ_{xp} is 0.0082 across countries. In contrast, the correlation between γ_{xy} and α_{2y} is negative, -0.20 and the correlation between γ_{xy} and β_x is positive, 0.38. That is because devaluation appears contractionary of aggregate demand and, therefore, real output growth in some countries.[30] Supply-side constraints appear, therefore, more dominant in differentiating the inflationary effects of devaluation policies across countries.

In summary, supply-side constraints appear to be an important factor in differentiating the effects of stabilization policies across countries. Where supply-side constraints are less binding, real output growth is more responsive to monetary policy across countries. In addition, supply-side constraints appear to be an important factor in determining the inflationary effects of an increase in government spending. The more binding supply-side constraints are, the steeper the aggregate supply curve and the larger the inflationary effects of an increase in government spending across countries. In addition, supply-side constraints appear important to the inflationary effects of devaluation. It appears, therefore, that capacity constraints have differentiated the effects of stabilization policies on real output growth and price inflation in the Middle East. The remainder of the investigation will then analyze how these differences affected economic performance in the Middle East.

VI Stabilization Policies and Economic Performance

Four measures of economic performance are under consideration: the trend growth of real output, the trend of price inflation, the variability of real output growth and the variability of price inflation. Trends are measured by the mean value (the sample average) of real output growth and price inflation. Variability is measured by the standard deviation of real output growth and price inflation. To determine the effects of stabilization

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[30] This signals the failure of devaluation to stimulate export growth while raising the cost of necessary imports for which domestic substitutes are not available.

policies on economic performance, two factors are under consideration: (i) changes in stabilization variables implied by policy decisions (the trend and variability of the policy change) and (ii) structural constraints that determine the policy effects on price inflation and output growth. The first factor is approximated by the mean and standard deviation of the growth in the money supply, government spending, and the exchange rate. The second factor is approximated by the parameters measuring the real and inflationary effects of stabilization policies. The combined effects of policy decisions and structural constraints measure the contribution of policy variables to economic performance.

Table 6 evaluates the contributions of stabilization policies to economic performance across countries of the Middle East. The contribution of policy changes to trend price inflation and output growth is the product of the average policy change times the parameter determining its effect on price inflation or output growth. Similarly, the policy contribution to the variability of price inflation and output growth is the product of the standard deviation of the policy change times the parameter determining its effect on price inflation or output growth.

Structural differences have emphasized the inflationary results of monetary policy across countries. In regression 1, the contribution of the trend growth of the money supply has a large positive and statistically significant effect on trend price inflation across countries. It appears, however, that the inflationary cost of monetary growth was necessary to achieve real lasting effects on output growth. Indeed, structural differences have emphasized the ability of monetary policy to stimulate real output growth across countries. This is consistent with a positive and statistically significant effect that the contribution of trend monetary growth has on trend real output growth across countries in regression 2. Structural differences have also enhanced the potential of monetary policy to determine price variability across countries. In regression 3, the contribution of monetary variability is statistically significant in determining price variability across countries.

Devaluation policy is particularly important in determining trend price inflation across countries of the Middle East. In regression 1, trend devaluation has a positive and statistically significant contribution to trend price inflation across countries. This is in contrast to decisions to vary government spending for which contributions lack statistical significance in determining the indicators of economic performance across

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countries in Table 6. On the other hand, structural differences appear to have insulated real output variability from the effects of variations in stabilization policies. The contributions of policy changes are statistically insignificant in determining the difference in real output variability across countries in regression 4.

All in all, the evidence presents structural limitations on the effectiveness of fiscal policies to determine economic performance across countries of the Middle East. The contributions of the change in government spending to economic performance are not statistically significant in explaining observed differences across countries. In contrast, structural differences appear to have reinforced the potential success of monetary policy in determining economic performance across countries. Indeed, the evidence is consistent with an important role for monetary growth in determining the trend and variability of price inflation across countries. Trend devaluation appears also important in escalating trend price inflation across countries. More importantly for the design of stabilization policies, monetary policy appears successful in achieving real lasting effects that contribute to the difference in realized trend real output growth across countries of the Middle East.[31]

A graphical illustration of the statistically significant relationships in the cross-section regressions is provided in Figures 1 through 4. Figure 1 illustrates the relationship between trend price inflation and the inflationary contribution of trend monetary growth across countries. Figure 2 is a scatter plot of trend price inflation and the inflationary contribution of trend devaluation across countries. Figure 3 illustrates the relationship between trend real output growth and the real contribution of trend monetary growth across countries. Finally, Figure 4 illustrates the relationship between the variability of price inflation and the inflationary contribution of monetary variability across countries.

VII   Summary and Conclusion

This investigation has focused on the role of stabilization policies across countries of the Middle East. Three measures of stabilization policies are under consideration: the growth of the money supply, the growth

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[31] This evidence is consistent with the results of earlier research on the potential success of stabilization policies in LDCs. The evidence of Kandil (1991) suggests that structural differences between developing and developed countries present a higher potential of success for monetary policy as an effective stabilization tool in LDCs. Fiscal policies are likely to be less effective as stabilizing tools in LDCs.

of government spending, and the devaluation of domestic currency. The real and inflationary effects of stabilization policies are likely to vary in response to demand and supply-side constraints.

On the demand side, the size of demand shifts attributed to stabilization policies is dependent on structural parameters characterizig financial and goods markets. The statistically significant correlations suggest the following. The effects of monetary policy on aggregate demand are exacerbated the larger the propensity to consume, invest, and import out of income. This highlights the importance of monetary growth in financing the increased spending across countries of the Middle East. In contrast, the size of demand shifts attributed to government spending is larger where the marginal propensity to spend appears smaller. This highlights the importance of government spending to stimulate demand where private spending is not adequate to sustain economic growth.

Supply-side constraints dominate, however, the size of demand shifts in explaining the real and inflationary effects of stabilization policies across countries of the Middle East. Underlying these constraints are capacity limitations that determine the ability to vary the output produced in response to aggregate demand shifts. Supply-side constraints appear important in determining the effects of monetary policy on real output growth across countries of the Middle East. The less binding capacity constraints are, the larger the real effects of monetary policy. Further, the inflationary effects of an increase in government spending and a devaluation of the domestic currency are larger where capacity constraints are more binding. That is, the ability to expand the output produced moderates the inflationary effects of expansionary fiscal and devaluation policies across countries of the Middle East.

Finally, the empirical evidence evaluates the effects of stabilization policies on economic performance in the Middle East. Four indicators are under consideration: The trend and variability of price inflation and output growth. The contributions of stabilization policies to these indicators approximate policy decisions and structural limitations determining the policy effects on output and prices. Among stabilization policies under consideration, monetary growth and, to a lesser extent, devaluation appear important to the difference in economic performance across countries of the Middle East. A higher trend growth of the money supply increases the trend growth of real output at a cost of escalating trend price inflation. In addition, the

variability of monetary growth increases the variability of price inflation across countries. A higher trend devaluation of the domestic currency is also escalating of trend price inflation across countries. In contrast, structural constraints limit the effects of fiscal policies on economic performance across countries of the Middle East.

To conclude, the analysis of the paper has provided an attempt to evaluate structural differences underlying the success of stabilization policies in the Middle East. It is important, however, to emphasize that the frequent intervention by governments in the form of regulations that control economic variables may be an important component of the observed differences. One is led, therefore, to wonder whether these actions act to interfer with the success of stabilization policies in the Middle East. May be the time has come for policy makers in the Middle East to appreciate the value of the free market in enhancing the ability of their countries to achieve economic development. As they move in this direction, the analysis of the paper should prove more valuable towards understanding the limitations of stabilization policies and drawing the appropriate actions that maximize their positive results in the Middle East.

Appendix
Data Description and Sources

- Aggregate Demand: output of GDP for Algeria, Bahrain, Iran, Sudan, and Syria and output of GNP for Egypt, Jordan, Kuwait, Morocco, Saudi Arabia, Tunisia, Turkey, and the Yemen Arab Republic.

- Real Output: real output of GDP or GNP, as listed above.

- The Price Level: the deflator for GDP or GNP for Syria and the Yemen Arab Republic and the consumer price index (CPI) for all other countries.

- The Oil Price: the export price of oil for Algeria and Morocco. For all other countries, the oil price is measured by the export price of oil for Kuwait.

- Short-term Interest Rate: the discount rate or representatives of short-term market rates.

- Consumption, investment, government spending, exports, and imports: nominal values of all payments which are deflated by the price level to measure real values.

- The Money Supply: currency and checkable deposits.

- Domestic Currency Price of Foreign Currency: the end of the period national currency value of SDRs.

The sample period for the estimation varies across countries based on data availability. All data are taken from *International Financial Statistics*, year books, issued by the International Monetary Fund, Washington, D.C.

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Table 1. Summary Statistics

Country	Statistics	Dy	Dp	$Dngnp$	$Dmoney$	$Dgov$	Dcx
Algeria	mean	0.063	0.082	0.11	0.16	0.11	0.046
	std dev.	0.095	0.034	0.12	0.082	0.17	0.10
	min.	-0.12	0.027	-0.19	-0.0087	-0.37	-0.033
	max.	0.36	0.16	0.41	0.28	0.59	0.50
Bahrain	mean	0.039	0.061	0.081	0.10	0.13	0.0049
	std dev.	0.080	0.072	0.12	0.13	0.10	0.059
	min.	-0.080	-0.027	-0.15	-0.066	-0.0086	-0.092
	max.	0.21	0.22	0.33	0.50	0.28	0.15
Egypt	mean	-0.059	0.081	0.12	0.12	0.11	0.060
	std dev.	0.061	0.069	0.079	0.097	0.092	0.17
	min.	-0.21	-0.032	-0.0041	-0.034	-0.15	-0.091
	max.	0.037	0.21	0.30	0.44	0.28	0.68
Iran	mean	0.052	0.097	0.15	0.18	0.16	0.0056
	std dev.	0.13	0.079	0.13	0.11	0.14	0.020
	min.	-0.25	-0.0074	-0.14	-0.16	-0.030	-0.021
	max.	0.42	0.25	0.56	0.45	0.71	0.082
Jordan	mean	0.042	0.087	0.11	0.13	0.10	0.0024
	std dev.	0.077	0.057	0.13	0.075	0.10	0.015
	min.	-0.11	-0.002	-0.34	-0.035	-0.086	-0.028
	max.	0.19	0.23	0.40	0.29	0.35	0.083
Kuwait	mean	-0.015	0.055	0.11	0.13	0.11	0.0021
	std dev.	0.10	0.035	0.24	0.30	0.10	0.033
	min.	-0.23	0.0059	-0.15	-0.20	-0.089	-0.053
	max.	0.13	0.12	1.029	1.37	0.32	0.12
Morocco	mean	0.044	0.054	0.099	0.11	0.11	0.034
	std dev.	0.041	0.040	0.066	0.053	0.098	0.064
	min.	-0.028	-0.11	-0.028	-0.0032	-0.033	-0.038
	max.	0.13	0.16	0.31	0.24	0.44	0.20

Table 1. Summary Statistics (cont'd....)

Country	Statistics	Dy	Dp	Dngnp	Dmoney	Dgov	Dex
Saudi Arabia	mean	0.058	0.14	0.22	0.16	0.16	0.01
	std dev.	0.074	0.26	0.30	0.17	0.22	0.059
	min.	-0.11	-0.25	-0.18	-0.023	-0.10	-0.065
	max.	0.18	0.89	1.01	0.66	0.61	0.18
Sudan	mean	0.024	0.13	0.15	0.19	..	0.083
	std dev.	0.10	0.13	0.12	0.13	..	0.20
	min.	-0.18	-0.11	0.00	-0.047	..	-0.066
	max.	0.24	0.49	0.46	0.52	..	0.77
Syria	mean	0.062	0.15	0.15	0.16	0.14	0.043
	std dev.	0.078	0.11	0.11	0.086	0.10	0.17
	min.	-0.061	0.0016	0.00058	-0.042	0.0035	-0.091
	max.	0.21	0.46	0.47	0.38	0.43	0.99
Tunisia	mean	0.058	0.051	0.12	0.12	0.11	0.035
	std dev.	0.039	0.038	0.055	0.074	0.055	0.068
	min.	-0.014	-0.041	0.014	-0.010	0.014	-0.075
	max.	0.16	0.13	0.27	0.26	0.25	0.21
Turkey	mean	0.051	0.21	0.25	0.25	0.25	0.21
	std dev.	0.029	0.18	0.15	0.13	0.15	0.25
	min.	-0.029	0.00	0.058	0.056	0.041	0.00
	max.	0.11	0.74	0.70	0.53	0.67	0.98
Yemen Arab Republic	mean	0.084	0.19	0.21	0.25	0.23	0.073
	std dev.	0.051	0.060	0.10	0.20	0.12	0.18
	min.	0.033	0.075	0.043	0.026	-0.030	-0.091
	max.	0.21	0.28	0.49	0.77	0.39	0.52
Yemen Democratic Republic	mean	..	0.079	..	0.13	..	0.0071
	std dev.	..	0.051	..	0.11	..	0.055
	min.	..	0.012	..	-0.052	..	-0.093
	max.	..	0.18	..	0.39	..	0.16

Notes:

- Dy: real output growth.

- Dp: price inflation.

- $Dngnp$: the growth in aggregate demand.

- $Dmoney$: the growth in the money supply.

- $Dgov$: the growth in government spending.

- Dex: the change in the domestic currency price of SDRs.

- mean: the sample average.

- std dev.: the sample standard deviation.

- min. and max.: the sample minimum and maximum values.

- .. denotes data are not available.

Table 2. Demand-Side Structural Parameters

Country	c'	i'_y	o'	i'_r	k'	l'
Algeria 64-88	0.46 (27.69)	0.27 (7.23)	0.11 (1.70)	..	0.74 (13.39)	..
Egypt 55-89	0.75 (31.35)	0.29 (6.79)	0.45 (14.49)	0.43 (0.48)	0.38 (6.56)	2.89 (2.17)
Iran 59-88	0.42 (10.03)	0.27 (11.48)	0.22 (7.24)	..	0.23 (5.65)	..
Jordan 59-89	0.77 (24.63)	0.24 (3.28)	0.65 (5.53)	-0.23 (-0.59)	0.39 (10.49)	0.12 (0.48)
Kuwait 62-89	0.18 (1.73)	0.042 (1.05)	0.19 (2.66)	-0.042 (-0.12)	0.080 (1.78)	-0.50 (-0.57)
Morocco 55-88	0.70 (35.40)	0.32 (12.42)	0.39 (12.21)	0.44 (-0.03)	-0.087 (21.15)	(-2.61)
Syria 63-88	0.65 (41.37)	0.31 (15.76)	0.34 (11.12)	..	0.56 (11.22)	..
Tunisia 60-88	0.61 (77.41)	0.40 (11.29)	0.48 (24.45)	-1.59 (-3.60)	0.29 (21.64)	0.12 (0.72)
Turkey 55-83	0.71 (46.70)	0.25 (31.58)	0.19 (15.92)	-0.29 (-7.08)	0.25 (25.72)	-0.56 (-8.32)

Notes:

•

$$con = \bar{c} + c'y$$
$$inv = \bar{i} + i'_y y + i'_r r$$
$$imp = \bar{o} + o'y$$
$$md = \bar{m} + k'y + l'r$$

• c', i'_y and o' are the estimates of the marginal propensity to consume, invest, and import out of income.

• i'_r is the interest sensitivity of investment demand.

• k' and l' are the income and interest sensitivity of money demand.

• .. denotes data are not available for estimation.

Table 3. Estimates of the Output-Inflation Tradeoff

Country	Dependent Variable	α_0	α_1	α_2	α_3	ρ	R^2
Algeria	Dy 55-85	-0.051 (-1.62)	-0.087 (-1.03)	0.73 (4.43)	0.090 (2.04)	0.53 (1.82)	0.93
	Dp 69-85	-0.0069 (-0.36)	0.52 (3.07)	0.38 (2.85)	-0.094 (-2.66)	-0.53 (-1.54)	0.60
Bahrain	Dy 75-88	0.00086 (0.04)	0.16 (0.28)	0.23 (0.76)	-0.075 (-0.74)	-0.20 (-0.29)	0.11
	Dp 65-88	2.53 (0.07)	-0.25 (-1.67)	0.34 (2.78)	-0.20 (-5.17)	1.0078 (8.45)	0.90
Egypt	Dy 55-89	-0.10 (-1.01)	-0.29 (-1.34)	-0.15 (-1.13)	-0.0027 (-0.11)	0.88 (6.22)	0.59
	Dp 55-89	-0.0062 (-0.52)	0.70 (4.82)	0.26 (2.45)	0.0079 (0.32)	-0.24 (-1.08)	0.67
Iran	Dy 64-88	-0.22 (-0.48)	-0.21 (-3.14)	0.78 (10.19)	0.028 (0.86)	0.95 (8.02)	0.90
	Dp 59-88	-0.0047 (-0.21)	0.75 (4.12)	0.24 (2.40)	-0.042 (-0.97)	0.048 (0.17)	0.64
Jordan	Dy 69-89	-0.0095 (-0.32)	-0.18 (-1.14)	0.61 (4.36)	-0.068 (-2.49)	0.51 (1.59)	0.75
	Dp 69-89	0.034 (2.68)	0.19 (0.64)	0.14 (1.25)	0.080 (4.32)	-0.31 (-0.84)	0.16
Kuwait	Dy 70-88	-0.06 (-1.75)	0.019 (0.09)	0.85 (4.22)	-0.63 (-3.92)	0.36 (1.03)	0.64
	Dp 72-88	0.026 (0.99)	0.46 (0.97)	-0.081 (-1.16)	0.075 (1.70)	0.29 (0.43)	0.72
Morocco	Dy 64-90	0.0097 (0.48)	-0.40 (-2.17)	0.49 (3.65)	-0.019 (-0.78)	0.16 (0.53)	0.56
	Dp 55-89	-0.012 (-1.62)	0.60 (6.94)	0.30 (4.49)	0.034 (2.50)	-0.24 (-1.19)	0.80

Table 3. Estimates of the Output-Inflation Tradeoff (cont'd....)

Country	Dependent Variable	α_0	α_1	α_2	α_3	ρ	R^2
Saudi Arabia	Dy 67-89	0.82 (0.07)	-0.039 (-0.10)	0.022 (0.38)	-0.065 (-1.51)	1.026 (2.52)	0.46
	Dp 63-89	-0.011 (-0.20)	0.18 (1.02)	0.35 (2.34)	0.49 (3.16)	-0.29 (-0.64)	0.84
Sudan	Dy 55-87	-0.12 (-1.82)	-0.18 (-0.95)	0.91 (4.39)	-0.023 (-0.36)	0.67 (3.94)	0.38
	Dp 55-87	0.27 (1.50)	-0.48 (-2.29)	0.012 (0.07)	0.034 (0.69)	0.87 (7.49)	0.52
Syria	Dy 60-88	-0.0086 (-0.38)	0.18 (0.56)	0.34 (2.36)	0.034 (0.77)	-0.28 (-0.64)	0.43
	Dp 63-88	0.00079 (0.35)	-0.016 (-1.03)	0.98 (53.58)	-0.0051 (-1.16)	-0.26 (-0.90)	0.99
Tunisia	Dy 68-90	-0.046 (-1.21)	0.15 (0.54)	0.72 (3.11)	-0.032 (-0.95)	0.20 0.57	0.51
	Dp 68-90	0.089 (2.53)	-0.56 (-3.37)	0.08 (0.86)	-0.02 (1.13)	0.83 (7.42)	0.53
Turkey	Dy 57-87	0.052 (1.60)	0.24 (0.51)	-0.048 (-1.18)	0.007 (0.37)	-0.15 (-0.31)	0.11
	Dp 55-87	-0.085 (-6.46)	0.055 (0.73)	1.077 (13.54)	-0.08 (-3.06)	-0.20 (-1.01)	0.95
Yemen Arab Republic	Dy 69-87	0.11 (4.99)	-0.66 (-3.22)	0.013 (0.23)	-0.0064 (-0.36)	0.48 (4.43)	0.35
	Dp 72-87	0.024 (0.55)	0.37 (1.99)	0.46 (5.25)	0.015 (0.61)	0.15 (0.42)	0.77

Notes:

- Models:

$$Dy = \alpha_{0y} + \alpha_{1y}Dyl1 + \alpha_{2y}Dngnp + \alpha_{3y}Doilp$$
$$Dp = \alpha_{0p} + \alpha_{1p}Dpl1 + \alpha_{2p}Dngnp + \alpha_{3p}Doilp$$

- ρ is the estimate of the first-order serial correlation parameter.

- t-ratios are in parantheses.

Table 4. Estimates of Aggregate Demand Shifts in Response to Stabilization Policies

Country	β_0	β_m	β_g	β_x	ρ	R^2	$Corr_{mg}$	$Corr_{mx}$	$Corr_{gx}$
Algeria 64-88	-0.0037 (-0.084)	0.42 (1.85)	0.54 (2.61)	-0.19 (-0.78)	0.098 (0.43)	0.49	0.37	-0.50	0.063
Bahrain 75-88	0.013 (0.27)	0.44 (1.99)	0.28 (0.74)	-0.26 (-0.71)	-0.17 (-0.49)	0.72	0.68	-0.12	-0.47
Egypt 55-89	0.60 (2.60)	0.28 (2.40)	0.17 (1.83)	0.12 (1.44)	-0.41 (-2.34)	0.59	0.31	-0.023	-0.17
Iran 59-88	-0.0061 (-0.16)	0.30 (1.83)	0.66 (4.67)	-1.16 (-1.37)	0.21 (0.98)	0.54	0.18	0.16	0.11
Jordan 59-89	0.016 (0.30)	0.40 (1.20)	0.37 (1.61)	0.41 (0.31)	-0.17 (-0.88)	0.23	0.35	-0.22	-0.15
Kuwait 62-89	-0.015 (-0.21)	-0.18 (-0.61)	1.28 (2.21)	0.64 (0.50)	0.12 (0.48)	0.23	0.47	-0.12	-0.34
Morocco 58-35	0.0047 (0.24)	0.81 (4.063)	0.034 (0.34)	0.20 (1.45)	0.35 (1.89)	0.49	0.53	-0.069	-0.16
Saudi Arabia 67-89	0.039 (0.34)	-0.22 (-0.53)	0.97 (2.41)	-0.46 (-0.20)	0.13 (0.43)	0.34	0.64	-0.19	-0.29
Sudan 55-89	0.028 (0.91)	0.67 (3.86)	.. ..	0.0013 (0.012)	0.11 (0.59)	0.40	..	0.42	..
Syria 60-88	-0.012 (-0.28)	0.32 (1.23)	0.61 (3.38)	0.30 (1.18)	0.28 (1.27)	0.49	0.52	-0.14	-0.016
Tunisia 60-89	0.045 (2.24)	0.44 (3.59)	0.21 (1.39)	-0.11 (-0.90)	0.13 (0.63)	0.47	0.31	-0.23	0.022
Turkey 55-89	0.0096 (0.36)	0.53 (3.52)	0.33 (2.56)	0.17 (2.78)	0.14 (0.75)	0.78	0.69	0.43	0.45
Yemen Arab 69-87	0.13 (1.56)	0.12 (0.68)	0.19 (0.60)	-0.023 (-0.11)	0.18 (0.55)	0.13	0.28	-0.045	-0.43
Yemen Democratic 65-89	..	..	..	..	..	..	..	-0.15	..

Notes:

- Model:

$$Dngnp = \beta_0 + \beta_m Dmoney + \beta_g Dgov + \beta_x Dex$$

- ρ is the estimate of the first-order serial correlation parameter.

- t-ratios are in parantheses.

- $Corr_{mg}$ is the correlation between monetary growth and the growth in government spending.

- $Corr_{mx}$ is the correlation between monetary growth and the change in the domestic currency price of SDRs.

- $Corr_{gx}$ is the correlation between the growth in government spending and the change in the domestic currency price of SDRs.

Table 5. The Real and Inflationary Effects of Stabilization Policy

Country	Dependent Variable	γ_0	γ_1	γ_m	γ_g	γ_x	γ_3	ρ	R^2
Algeria	Dy 64-85	-0.056 (-1.92)	-0.12 (-1.09)	0.53 (3.89)	0.050 (0.29)	-0.10 (-0.41)	0.26 (10.30)	0.21 (0.55)	0.95
	Dp 69-85	0.053 (1.39)	0.32 (1.32)	-0.22 (-1.33)	0.32 (2.41)	0.36 (0.91)	-0.030 (-1.25)	-0.28 (-0.76)	0.64
Bahrain	Dy 75-88	0.078 (3.78)	0.51 (2.88)	-0.18 (-1.47)	-0.86 (-5.16)	-0.82 (-5.36)	-0.14 (-2.98)	0.49 (4.81)	0.93
	Dp 65-88	0.19 (0.01)	-0.32 (-0.87)	0.051 (0.38)	0.17 (0.81)	0.0053 (0.03)	-0.15 (-2.66)	0.97 (7.78)	0.86
Egypt	Dy 55-89	0.0080 (0.61)	0.76 (5.30)	-0.21 (-2.02)	-0.015 (-0.15)	0.0024 (0.04)	0.022 (0.70)	-0.29 (-1.25)	0.68
	Dp 55-89	0.11 (1.37)	-0.19 (-0.87)	0.093 (0.88)	-0.013 (-0.19)	-0.0.077 (-1.35)	0.013 (0.47)	0.87 (7.02)	0.66
Iran	Dy 64-88	0.013 (0.11)	-0.49 (-1.87)	0.096 (0.33)	0.37 (1.07)	-1.25 (-1.03)	0.13 (0.99)	0.63 (2.45)	0.52
	Dp 59-88	0.32 (0.39)	-0.43 (-1.71)	-0.14 (-1.77)	0.17 (1.25)	-0.08 (-0.22)	-0.029 (-0.52)	0.97 (10.03)	0.74
Jordan	Dy 69-89	0.0048 (0.11)	0.12 (0.31)	0.31 (1.05)	0.096 (0.49)	-1.67 (-0.67)	-0.098 (-1.36)	0.063 (0.17)	0.26
	Dp 69-89	0.47 (0.00)	-0.36 (-1.99)	0.32 (3.21)	-0.096 (-2.06)	-0.47 (-1.78)	0.041 (2.74)	0.96 (5.25)	0.83
Kuwait	Dy 70-88	0.00075 (0.02)	-0.20 (-0.29)	-0.20 (-1.03)	-0.075 (-0.21)	0.79 (1.02)	-0.014 (-0.15)	0.12 (0.17)	0.31
	Dp 72-88	0.72 (0.00)	0.12 (0.31)	0.0089 (0.30)	0.086 (1.53)	0.11 (0.75)	0.023 (0.95)	1.00 (2.97)	0.97
Morocco	Dy 64-90	0.044 (1.42)	-0.41 (-0.81)	0.097 (0.43)	0.12 (1.34)	-0.14 (-1.18)	0.0071 (0.29)	-0.26 (-0.45)	0.49
	Dp 55-89	0.048 (1.39)	-0.094 (-0.58)	0.13 (1.27)	0.031 (0.59)	-0.20 (-1.83)	0.062 (3.50)	0.83 (6.81)	0.68

Table 5. The Real and Inflationary Effects of Stabilization Policy (cont'd....)

Country	Dependent Variable	γ_0	γ_1	γ_m	γ_g	γ_x	γ_3	ρ	R^2
Saudi Arabia	Dy 67-89	-0.0012 (-0.07)	0.88 (3.73)	0.048 (0.54)	0.017 (0.12)	0.11 (0.50)	-0.069 (-0.99)	-0.46 (-1.52)	0.20
	Dp 63-89	0.009 (0.17)	0.018 (0.06)	0.33 (1.01)	-0.059 (-0.16)	0.073 (0.11)	0.65 (3.91)	-0.28 (-0.77)	0.76
Sudan	Dy 55-87	0.019 (0.52)	-0.081 (-0.22)	0.17 (0.81)	..	-0.31 (-2.15)	-0.033 (-0.50)	-0.34 (-0.86)	0.25
	Dp 55-87	-0.012 (-0.48)	0.50 (2.74)	0.38 (1.87)	..	0.066 (0.62)	0.045 (0.95)	-0.22 (-0.79)	0.66
Syria	Dy 60-88	0.015 (0.48)	0.21 (0.99)	-0.18 (-1.03)	0.39 (2.57)	-0.14 (-0.82)	0.03 (0.56)	-0.55 (-2.40)	0.47
	Dp 63-88	0.028 (0.59)	0.39 (1.85)	0.065 (0.23)	0.16 (0.64)	0.46 (1.91)	0.16 (1.92)	-0.35 (-1.03)	0.61
Tunisia	Dy 68-90	0.065 (2.59)	0.12 (0.42)	0.23 (1.39)	-0.17 (-1.23)	-0.42 (-2.43)	-0.031 (-0.80)	-0.54 (-1.39)	0.49
	Dp 68-90	0.07 (1.98)	-0.61 (-4.61)	-0.019 (-0.33)	0.34 (3.85)	0.007 (0.13)	-0.00078 (-0.06)	0.85 (7.87)	0.72
Turkey	Dy 57-87	0.067 (1.77)	-0.20 (-0.44)	0.077 (0.90)	-0.023 (-0.38)	-0.084 (-1.95)	-0.0049 (-0.24)	0.29 (0.59)	0.24
	Dp 55-87	-0.078 (-3.43)	0.11 (0.86)	0.28 (1.87)	0.50 (2.62)	0.24 (4.25)	0.061 (1.65)	-0.55 (-2.99)	0.86
Yemen Arab Republic	Dy 69-87	0.058 (2.13)	-0.44 (-0.84)	0.095 (2.50)	0.043 (0.76)	0.0039 (0.10)	0.0056 (0.21)	-0.18 (-0.28)	0.63
	Dp 72-87	0.86 (0.00)	-0.50 (-1.01)	0.14 (0.66)	0.22 (0.94)	0.18 (1.40)	-0.032 (-0.39)	0.90 (2.12)	0.11
Yemen Democratic Republic	Dy	..	..	..	..	..	..	..	
	Dp 65-89	0.068 (2.37)	0.054 (0.18)	-0.072 (-0.63)	..	-0.12 (-0.45)	0.11 (3.01)	-0.46 (-1.37)	0.52

Notes:

● Models:

$$Dy = \gamma_{0y} + \gamma_{1y} Dyl1 + \gamma_{my} Dmoney + \gamma_{gy} Dgov + \gamma_{xy} Dex + \gamma_{3y} Doilp$$
$$Dp = \gamma_{0p} + \gamma_{1p} Dpl1 + \gamma_{mp} Dmoney + \gamma_{gp} Dgov + \gamma_{xp} Dex + \gamma_{3p} Doilp$$

● t-ratios are in parantheses.

● ρ is the estimate of the first-order serial correlation parameter.

Table 6. Stabilization Policies and Economic Performance: Cross-Country Results

Dependent Variable	Explanatory		Variables		R^2
$\overline{(Dp)}$ Trend Price Inflation	constant	$\gamma_{mp}(\overline{Dmoney})$	$\gamma_{gp}(\overline{Dgov})$	$\gamma_{xp}(\overline{Dex})$	
	0.08* (5.47)	0.68** (1.72)	-0.095 (-0.15)	2.35** (1.45)	0.73
$\overline{(Dy)}$ Trend real output growth	constant	$\gamma_{my}(\overline{Dmoney})$	$\gamma_{gy}(\overline{Dgov})$	$\gamma_{xy}(\overline{Dex})$	
	0.027* (1.88)	0.54** (1.51)	0.086 (0.32)	-1.41 (-0.73)	0.33
$V(Dp)$ Price variability	constant	$\gamma_{mp}V(Dmoney)$	$\gamma_{gp}V(Dgov)$	$\gamma_{xp}V(Dex)$	
	0.05* (2.34)	2.52* (3.31)	0.067 (0.082)	0.43 (0.63)	0.63
$V(Dy)$ Output variability	constant	$\gamma_{my}V(Dmoney)$	$\gamma_{gy}V(Dgov)$	$\gamma_{xy}V(Dex)$	
	0.068* (5.88)	-0.36 (-0.89)	0.34 (1.038)	-0.22 (-0.39)	0.15

Notes:

- $\overline{(.)}$ denotes trend growth, the sample average of the variable change.

- $V(.)$ denotes variability, the sample standard deviation of the variable change.

- $\gamma_{mi}, \gamma_{gi}, \gamma_{xi}$, for $i = y, p$ measure the real and inflationary effects of stabilization policies from the model estimation in Table 5.

- * and ** denote statistical significance at the five and ten percent levels.

- t-ratios are in parantheses.

Figure 1.

The Relationship between Trend Price Inflation (p)
and the Inflationary Contribution of Trend
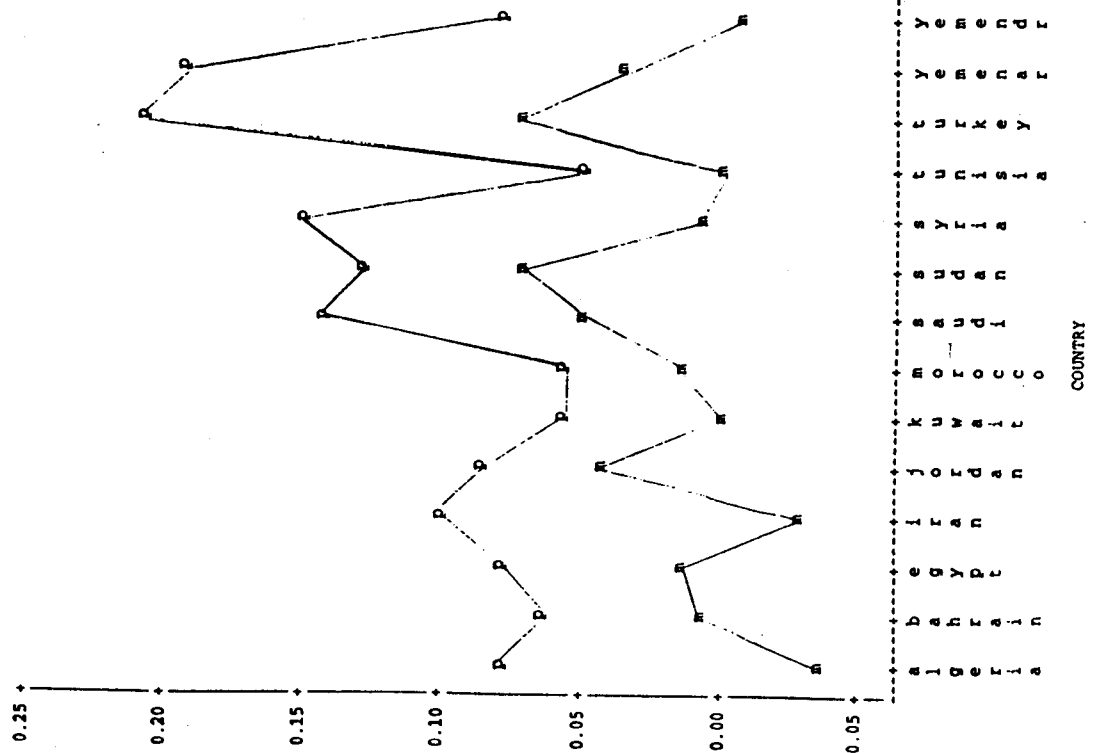Monetary Growth (m)

Figure 2.

The Relationship between Trend Price Inflation (p)
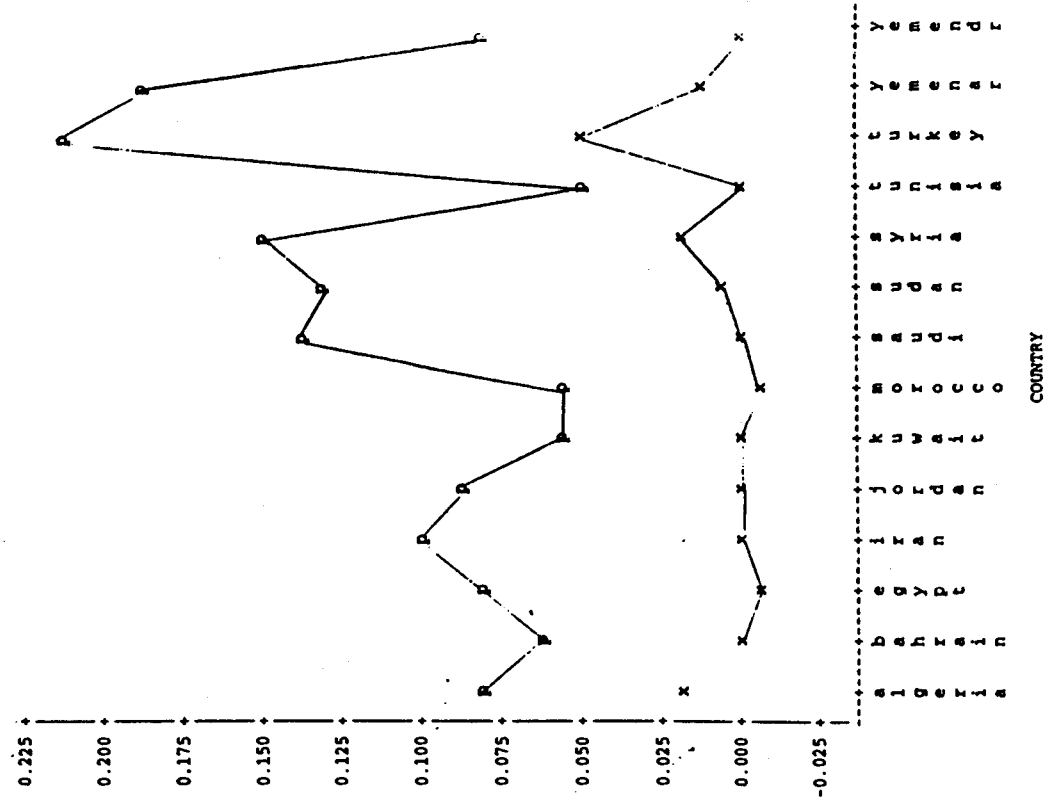and the Inflationary Contribution of Trend
Devaluation (x)

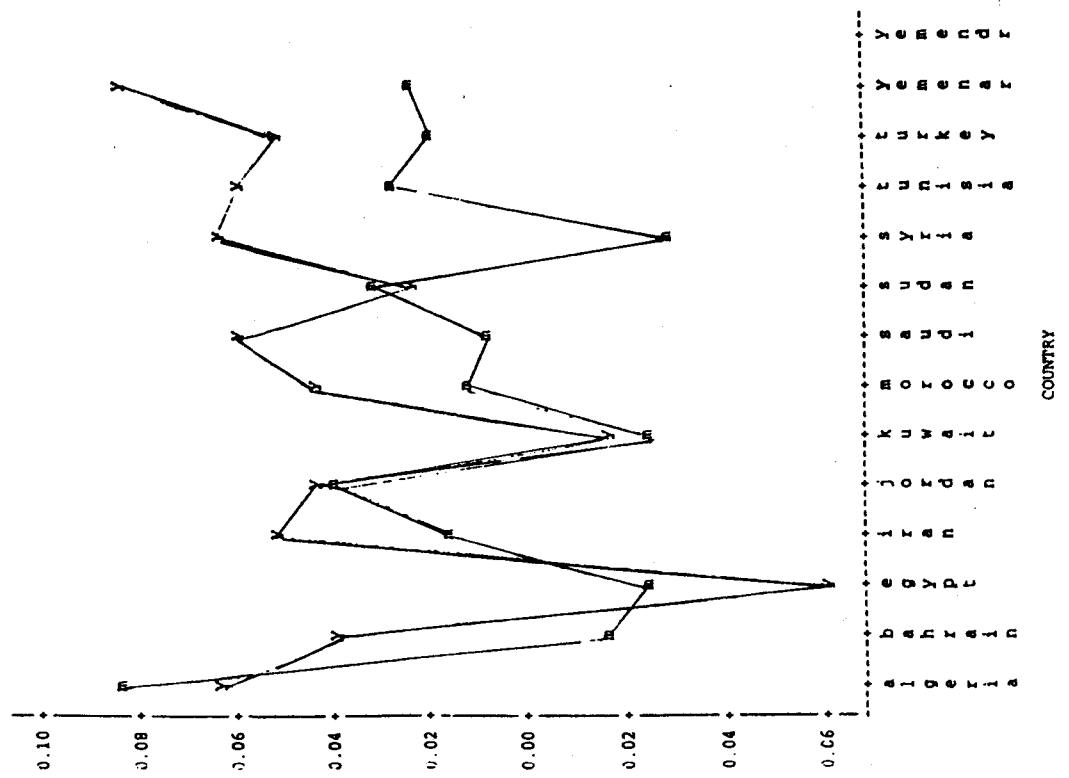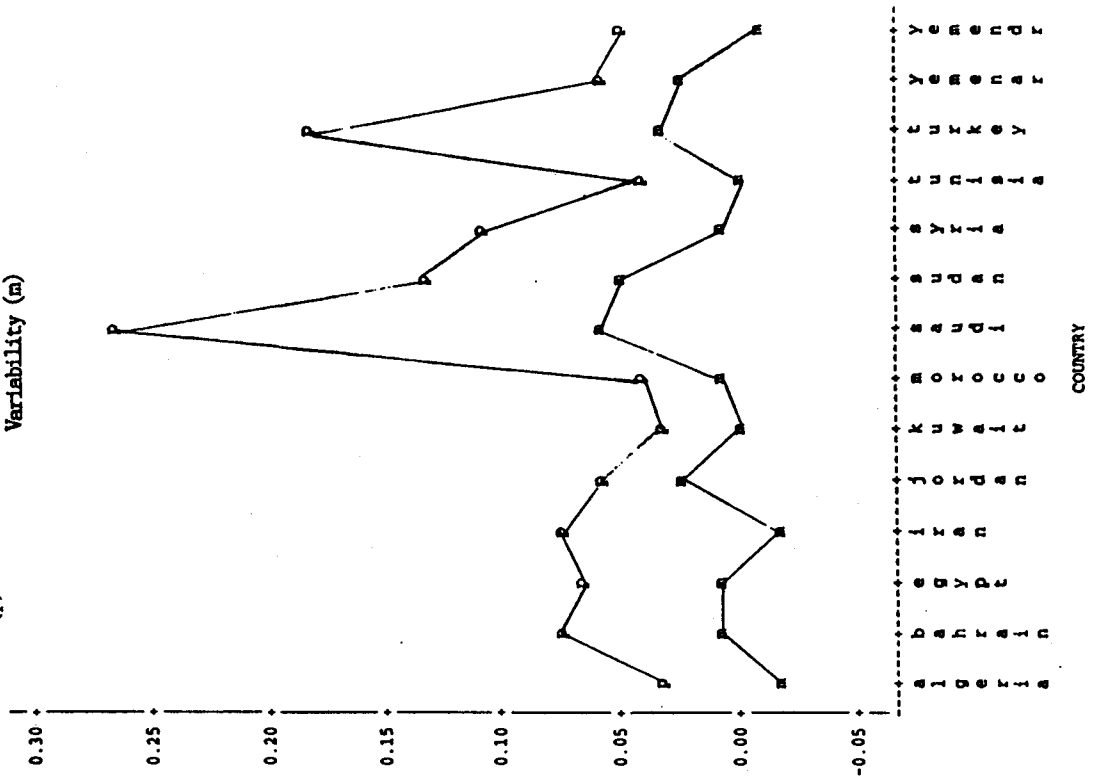# Figure 4.

The Relationship between the Variability of Price Inflation
(p) and the Inflationary Contributin of Monetary
Variability (m)

COUNTRY

Figure 3.

The Relationship between Trend Real Output Growth (y)
and the Real Contribution of Trend Monetary
Growth (m)

COUNTRY

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