

On the effects of monetary policy shocks in developing countries[☆]

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Abstract

Using annual data for a sample of developing countries, the time-series evidence indicates the allocation of monetary policy shocks, both expansionary and contractionary, between price inflation and output growth. Subsequently, cross-country regressions evaluate factors that underlie the difference in these allocations and their implications. The real effects of monetary shocks increase as the elasticity of aggregate demand increases with respect to monetary shocks. Nonetheless, capacity constraints hamper the output adjustment to monetary shocks and increase price inflation. Across countries, trend output growth increases with the output response to monetary shocks. Consistent with the stabilizing function of monetary policy, the variability of output growth decreases in the face of monetary fluctuations across countries. In contrast, monetary fluctuations increase the trend and variability of price inflation across countries.

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1. Introduction

Economic models that attempt to identify a reaction function for the monetary authority focus on central bank activities in developed countries. Those in developing countries, in contrast, do not get the same attention, owing to the belief that central banks in these countries were created with the primary objective of financing the government deficit. There has been, however, a growing surge of interest in analyzing monetary

policy in developing countries.¹ In these studies, investigators have differentiated between the type of policies: accommodative and stabilizing. An accommodative policy is defined to be a policy that provides a regular supply of credit for an expanding economy. A stabilizing policy, in contrast, is a policy that is used to dampen, or offset, undesired changes affecting the economy. In the first accommodative scenario, monetary growth accommodates output growth and price inflation. In the second stabilizing scenario, the monetary authority varies monetary growth in order to counter the

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¹ Recent research has considered several dimensions that could impact on the effectiveness of monetary policy, e.g., uncertainty and labor market frictions (Kilponen & Leitimo, 2008; Sala, 2008); asset substitution (Jones, 2008); international policy coordination (Chapman, 2008; Sahuc & Smets, 2008); exchange rate pressure (Kumah, 2007); Islamic management (Wilson, 2008); fiscal crises and globalization (Sentance, 2008); central bank profitability (Buiter, 2008); monetary union (Kamar & Naceur, 2007); influencing private sector (Weise, 2008); tradeoffs (Graham & Snower, 2008); rules versus discretion (Doyle & Falk, 2008).



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effects of other shocks, depending on the objectives of monetary policy.

Many central banks in developing countries lack independence in their operations. Hence, the objectives of monetary policy may not be clearly defined.² The stabilizing function may be targeting output growth. Accordingly, the central bank increases liquidity in order to increase credit expansion and stimulate the economy during periods of a slowdown. In an extreme scenario, the government may be pursuing a leading role in structural, economic, and social development. Hence, the Central Bank may be obliged to provide credit to finance the increased government spending. A problem arises, however, if the increased government spending, by limiting available credit, crowds out private spending.³ Additionally, the increased spending may not be appropriately geared towards expanding productive capacity. Hence, higher government spending may prove inflationary. Financing the increased government spending via monetization depletes the stock of foreign reserves in a small open economy. As a result, devaluation of the domestic economy may prove necessary, increasing the risk of a vicious cycle of depreciation and inflation.

Given concerns about accommodating higher government spending, central banks may resort to establishing nominal anchors that guide the design of monetary policy. In a small open economy, priorities may be established to defend an exchange rate peg. Hence, the independence of monetary policy is severely undermined, since fluctuations in the interest rate may contradict the target for the exchange rate and the supporting level of foreign reserves.

Some developing countries may decide, however, that pegging the exchange rate is not the optimal anchor for monetary policy if they suffer from high inflation. Hence, targeting inflation may provide a better nominal anchor for the design of monetary policy. Accordingly, the monetary authority establishes a variety of indicators that drive the inflation process. The money supply responds to changes in these indicators in order to keep inflation under control. This scenario deprives the monetary authority of a good deal of independence.

Under a scenario that involves a higher degree of independence, the Central Bank may follow a more discretionary

approach. Hence, priorities may be established, and not necessarily announced, in reaction to economic development. The design of monetary policy may be targeting the stability of the exchange rate, the price level, or output growth.

Regardless of the objectives established for monetary policy, the ultimate result of fluctuations in the money supply will be absorbed in output growth and price inflation. The transmission mechanism of monetary policy to the real economy is through aggregate demand. The size of the aggregate demand shift is dependent on the liquidity effect attributed to a change in the money supply and the sensitivity of the aggregate demand to the change in liquidity. Crowding out may arise, however, if inflationary expectations develop and/or capital outflow increases.

Assuming that monetary policy is effective in stimulating demand growth, the allocation of the change in demand between output growth and price inflation is dependent on constraints on the supply side of the economy. Capacity constraints are bound to accelerate price inflation. Nonetheless, wage and/or price rigidity may reinforce the real effect and moderate the nominal effects of fluctuations in the money supply.

Realizing the complexity surrounding the effectiveness of monetary policy, the present investigation will shed some light on the results of variation in monetary growth in developing countries. The data under investigation are annual for a large sample of developing countries. The time-series evidence will indicate the effects of expansionary and contractionary monetary shocks on real output growth and price inflation within countries.

Cross-country regressions will evaluate constraints that determine the allocation of monetary shocks between output growth and price inflation across countries: supply constraints, the elasticity of aggregate demand, and the variability of monetary shocks. Underlying these factors are structural constraints on the demand and supply sides of the specific economy. Additionally, the analysis will demonstrate the effects of monetary shocks on key determinants of macroeconomic performance across countries.

To anticipate the results, both demand and supply constraints differentiate the impact of monetary policy on real growth across countries. The response of real growth increases the more elastic aggregate demand to the change in monetary growth. Moreover, supply-side constraints decrease the output response and increase price inflation in the face of monetary shocks. Economic performance is dependent on monetary variability. Across countries, trend output growth increases the higher the response of real growth to monetary shocks. Consistent with the stabilizing function of monetary policy, output variability decreases the higher the response of real growth to monetary shocks. In contrast, the variability of monetary shocks increases both the trend and variability of price inflation across countries. This evidence indicates the importance of monetary policy in determining economic performance in developing countries. Addressing structural constraints and increasing policy credibility are key determinants of the effectiveness of monetary policy.

² Some have claimed that lags, rigidities, and the disequilibrium analysis are the essence of short-term LDCs macro understanding (for example, [Behrman, 1981](#); [Crockett, 1981](#)). Others have focused on 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 macroeconomic policies in developing and developed countries, see [Kandil \(1991\)](#).

³ For more details, see [Bean and Buitert \(1987\)](#). Some studies have considered the evidence of specific factors that determine crowding out in the face of government spending. First is the impact of government spending on the interest rate (see, e.g., [Evans, 1987](#)). A second strand of the literature considered the sensitivity of investment demand to the change in the interest rate (see, e.g., [Chirinko, 1993](#)).

2. Theoretical background

An increase in the money supply increases the supply of credit.⁴ To bring the money market back to equilibrium, a reduction in the interest rate is necessary to stimulate money demand.⁵ In the goods market, aggregate spending increases in response to a reduction in the interest rate. Higher income stimulates money demand, moderating the necessary reduction in the interest rate. The effectiveness of monetary policy to stimulate aggregate demand is dependent, therefore, on three factors: (i) the elasticity of money demand with respect to a change in income, (ii) the elasticity of money demand with respect to a change in the interest rate, and (iii) the elasticity of aggregate spending with respect to a change in the interest rate.

The effectiveness of monetary policy decreases with the increase in the response of money demand to income. Following an increase in the money supply, higher response of money demand to an increase in income closes the disequilibrium gap and decreases the necessary reduction in the interest rate. The effectiveness of monetary policy increases the less responsive money demand to a change in the interest rate. Hence, a large reduction of the interest rate is necessary in the face of an increase in the money supply. The effectiveness of monetary policy also increases the higher the sensitivity of aggregate demand to a change in the interest rate. Accordingly, the size of aggregate demand shifts is maximized in the face of monetary shocks.

The above scenario is valid in a closed economy. In an open economy, fluctuations in the interest rate may affect capital mobility. A reduction in the interest rate induces capital outflow and reduces inflows. Subsequent reduction in reserves decreases the monetary base, mitigating the expansionary effect of monetary policy.⁶ Fluctuations in the exchange rate may also be relevant in this context. Assuming a flexible exchange rate, an increase in net capital outflow causes a depreciation of the exchange rate, which increases trade competitiveness. The resulting expansion in net exports reinforces the expansionary effect of monetary policy.

Conditions on the supply side of the economy are also relevant to the effects of monetary policy.⁷ The more flexible are wages and prices, the larger is the inflationary effect of monetary policy and the smaller is output expansion. Capacity constraints may also limit the output response to monetary

expansion, necessitating a faster adjustment of price inflation. The faster increase in price reduces real money balances and raises the interest rate, offsetting the positive effect of monetary policy on aggregate demand. The magnitude of the price increase determines the crowding out effect attributed to conditions in the product market.

Other factors may further complicate the analysis concerning the effectiveness of monetary policy. The objectives of monetary policy are also of some relevance. If monetary growth accommodates an increase in the government budget deficit, the Central Bank may deplete its limited stock of foreign reserves to finance higher government spending. Additionally, inflationary expectations are likely to develop, decreasing demand for money and accelerating price inflation. As confidence is shaken in the stability of the exchange rate, depreciation (devaluation) is bound to occur, which may further stimulate inflationary expectation and counter the effectiveness of monetary policy.⁸

Given channels of interaction in the macroeconomy, a study of the effectiveness of monetary policy requires an evaluation of parameters that measure flexibility and identify constraints on the demand and supply sides of the economy.

The framework of this investigation is an empirical study of the effects of the growth of the money supply on real output growth and price inflation in a sample of developing countries. To shed some light on determinants of variation across countries, the empirical estimation measures the elasticity of aggregate demand in the face of monetary shocks. To approximate supply-side constraints, the investigation will estimate the speed of price adjustment in the face of aggregate demand shocks.

3. Empirical framework

The empirical model comprises reduced form equations of output and price. The growth component of the series is the domain of real growth factors that vary with labor, capital, and technology. Test results indicate that this component is non-stationary.⁹ To account for non-stationarity, empirical models of real output and price are estimated in first-differenced form. Fluctuations in real output and price are attributed to a variety of shocks impinging on the economic system.

Assume aggregate demand shocks are distributed symmetrically around an anticipated steady-state trend over time. This trend is consistent with capacity utilization in the economy. Shocks to aggregate demand are allocated between output growth and price inflation.

⁴ See, e.g., Friedman (1968), Cagan (1972), Mishkin (1981), Tanzi (1984), and Mishkin (1988).

⁵ Research on the liquidity effect of monetary growth includes Coleman, Gilles, and La badié (1992), Leeper and Gordon (1992), Fama (1990), Mishkin (1992), Wallace and Warner (1993), and Soderlind (1999).

⁶ A reduction in international reserves prompts the monetary authority to slow down the growth of domestic credit in order to raise the domestic interest rate and attract foreign funds.

⁷ Some models, see, e.g., Lane and Perotti (1996), have focused on labor market conditions in judging supply-side constraints.

⁸ For a discussion, see, e.g., Caballero and Pyndick (1996). In an open economy, uncertainty decreases foreign direct investment and encourages capital outflow.

⁹ Test results, following the suggestions of Nelson and Plosser (1982), verify the empirical validity of this hypothesis. Based on tabulation provided by Dickey and Fuller (1981), real output and price are non-stationary in level and stationary in first-difference.

Aggregate demand varies with major determinants of domestic and foreign demand. On the domestic front, policy variables include government spending and the money supply. To account for interaction with the rest of the world through the current and financial accounts, the model specification also includes the exchange rate.

Assume shocks to the money supply are distributed randomly around a steady state moving trend over time. This trend varies with movements in the underlying fundamentals that determine the growth of the money supply over time. Fluctuations around this trend are symmetrically distributed.

Fluctuations in the face of monetary shocks are likely to be determined by supply and demand constraints. On the supply side, capacity constraints determine price flexibility in the face of aggregate demand shifts. More binding constraints imply a steeper aggregate supply curve and higher price flexibility. On the demand side, structural parameters determine the size of aggregate demand shifts in the face of monetary shocks. Less crowding out implies larger demand shifts in the face of monetary shocks.

As the transmission channel of random shocks, including monetary shocks, could vary during expansions and contractions, shocks are separated into positive and negative components to test possible asymmetry in the empirical models. Accordingly, the empirical models are specified as follows:

$$Dp_t = \alpha_0 + \alpha_1 E_{t-1} d_t + \alpha_2 E_{t-1} h_t + \alpha_{3p} pos_t + \alpha_{3n} neg_t + \alpha_{4p} posh_t + \alpha_{4n} negh_t + \eta_{1t} \tag{1}$$

$$Dds_t = \gamma_0 + \gamma_{1p} posg_t + \gamma_{1n} negg_t + \gamma_{2p} posm_t + \gamma_{2n} negm_t + \gamma_{3p} posh_t + \gamma_{3n} negh_t + \eta_{2t} \tag{2}$$

The empirical model in (1) approximates price flexibility in the face of aggregate demand shocks. $D(.)$ is the first-difference operator. $E(.)$ is the expected value of a given variable at time t based on information available to agents at time $t - 1$. Aggregate price inflation is denoted by Dp_t . Ed_t denotes anticipated growth in aggregate demand. The empirical model in (2) approximates the size of unanticipated aggregate demand shifts where Dds_t approximates the size of unanticipated shifts in the face of a variety of shocks. The exchange rate measures the domestic currency price of foreign currency. An increase indicates currency depreciation. Anticipated depreciation of the exchange rate is denoted by Eh_t . Positive and negative shocks to aggregate demand are denoted by pos_t and neg_t . Positive shocks to the exchange rate, $posh_t$, approximate unexpected depreciation of the domestic currency. Similarly, $negh_t$ approximates unexpected appreciation of the domestic currency. The residuals η_{1t} , and η_{2t} are random unexplained residuals with zero mean and constant variance.

Price flexibility in the face of aggregate demand shocks, α_{3p} and α_{3n} , is likely to be determined by conditions on the supply side of the specific economy. If α_{3p} is significantly larger than α_{3n} , the aggregate supply curve is steeper in the face of expansionary aggregate demand shifts compared to contractionary shifts.

Aggregate demand fluctuations vary with expansionary and contractionary government spending shocks, $posg_t$ and $negg_t$,

with magnitudes that equal γ_{1p} and γ_{1n} . The parameters γ_{2p} and γ_{2n} approximate the size of unanticipated shifts of aggregate demand in the face of expansionary and contractionary monetary shocks, $posm_t$ and $negm_t$. Unanticipated demand shifts in the face of currency depreciation and appreciation are approximated by γ_{3p} and γ_{3n} .

In the next step of the empirical investigation, models are estimated to measure the effects of fluctuations in the money supply on output growth and price inflation. A positive shock to the money supply increases credit availability. Through the multiplier process, the effect is reinforced on aggregate demand. Nonetheless, the possibility of crowding out may involve an offsetting effect on private spending. Changes in the money supply may be accommodating fluctuations in government spending and/or the exchange rate. Hence, both shocks enter the empirical models along with the change in the money supply.

Underlying the model specification is the assumption that cyclical fluctuations in the output supplied is attributed to changes in the output price around its anticipated value, i.e., output price surprises. Anticipated shifts in the aggregate economy guide production plans and nominal adjustments in steady state. In contrast, cyclical fluctuations are a function of demand shocks that include shocks to government spending, the money supply, and the exchange rate. In addition, fluctuations in the exchange rate may also determine cyclical fluctuations in the output supplied. Given that many of the sample countries are typically small and open economies with high dependency on imported goods, a depreciation of the exchange rate increases the cost of imported goods and decreases the output supplied.¹⁰

Substituting for aggregate demand shifts in (1) with specific shifts underlying aggregate demand results in the reduced form equations in (3) and (4). Real output growth and price inflation are a function of anticipated and unanticipated shifts in the exchange rate and specific policy variables underlying aggregate demand, government spending, and the money supply, as follows:

$$Dy_t = \beta_{0y} + \beta_{1y} E_{t-1} g_t + \beta_{2y} E_{t-1} m_t + \beta_{3y} E_{t-1} h_t + \beta_{4yp} posg_t + \beta_{4yn} negg_t + \beta_{5yp} posm_t + \beta_{5yn} negm_t + \beta_{6yp} posh_t + \beta_{6yn} negh_t + \eta_{3t} \tag{3}$$

$$Dp_t = \beta_{0p} + \beta_{1p} E_{t-1} g_t + \beta_{2p} E_{t-1} m_t + \beta_{3p} E_{t-1} h_t + \beta_{4pp} posg_t + \beta_{4pn} negg_t + \beta_{5pp} posm_t + \beta_{5pn} negm_t + \beta_{6pp} posh_t + \beta_{6pn} negh_t + \eta_{4t} \tag{4}$$

Real output growth is denoted by Dy_t . Eg_t and Em_t denote anticipated growth of government spending and the money supply. The residuals η_{3t} , and η_{4t} are random unexplained residuals with zero mean and constant variance.

¹⁰ For a detailed theoretical illustration, see Kandil and Mirzaie (2002).

Anticipated depreciation of the domestic currency is expected to increase the cost of the output supplied. Hence, output growth decreases, $\beta_{3y} < 0$, and price inflation increases, $\beta_{3p} > 0$. Anticipated growth in government spending and the money supply increases the demand for goods. Producers are expected to adjust price inflation to cope with anticipated demand growth, $\beta_{1p}, \beta_{2p} > 0$. Nonetheless, institutional rigidity may prevent prices from adjusting fully to anticipated demand growth, necessitating an increase in output growth, $\beta_{1y}, \beta_{2y} > 0$.

Unanticipated changes in the domestic currency affect both the demand and supply sides of the economy. Unanticipated depreciation of the domestic currency increases demand for exports and decreases domestic demand for imports. This channel increases real output growth and price inflation. Also on the demand side, unanticipated depreciation of the domestic currency is likely to increase money demand, decreasing velocity and, hence, domestic demand. This channel is likely to moderate the increase in real output growth and price inflation. On the supply side, unanticipated currency depreciation increases the cost of the output produced, decreasing output growth and raising price inflation. Hence, the net effect on output growth and price inflation, β_{6yp}, β_{6pp} , is dependent on structural parameters underlying the demand and supply channels. Of course, the opposite holds in the face of negative shocks to the exchange rate, i.e., unanticipated currency appreciation, as measured by β_{6yn}, β_{6pn} in (3) and (4).

Expansionary government spending shocks are expected to increase aggregate demand. Crowding out channels may moderate or offset the effects of government spending shocks on aggregate demand. If the net result is positive, expansionary government spending shocks increase price inflation and output growth, $\beta_{4yp}, \beta_{4pp} > 0$. The opposite holds for contractionary government spending shocks, as measured by β_{4yn}, β_{4pn} in (3) and (4).

Expansionary monetary shocks increase liquidity and, in turn, available credit. Subsequently, aggregate demand is likely to increase. Both output growth and price inflation respond positively to the increase in demand, $\beta_{5yp}, \beta_{5yn}, \beta_{5pp}, \beta_{5pn} > 0$. The effectiveness of monetary policy may be hampered, however, by accompanying domestic and external effects. Asymmetry is measured by the difference between β_{5yp} and β_{5yn} . If this difference is positive, the variability of monetary shocks increases real output growth, on average, over time. Similarly, if the difference between β_{5pp} and β_{5pn} is positive, the variability of monetary shocks increases price inflation, on average, over time.

4. Time-series evidence

The data under investigation are annual for a sample of 105 developing countries, data permitting.¹¹ The sample is diversified in many respects, including oil-producing Gulf countries

such as Qatar, Saudi Arabia, and the U.A.E., former Eastern Bloc countries, middle income countries like Argentina, Indonesia, and Mexico, and low income countries. The sample period for investigation extends from 1968 to 2008, including events such as Great inflation and the end of the Cold War to examine the effects of monetary policy shocks across different countries under different conditions. Description of variables and data sources are provided in Appendix B.¹² The empirical models (1) and (2), or (3) and (4) are estimated jointly with the equations that determine agents' forecasts of variables that enter the empirical model (see Appendix A for details). As described in the Appendix, the basic model consists of AD and AS equations and the model is closed with the equations for the monetary policy authority (some sort of Taylor rule), the fiscal policy rule and the exchange rate model.

The results of estimating the empirical models (3) and (4) are presented in Table 1. The time-series results highlight the effects of various factors in the empirical model on real output growth and price inflation.¹³ In the interest of space limitation, the analysis evaluates the parameters measuring the effects of monetary policy.

Anticipated monetary growth is expected to increase output growth and price inflation. A statistically significant increase in output growth is evident in sixteen countries. Nonetheless, there is evidence of a significant reduction in real output growth in the face of anticipated monetary growth. As indicated above, anticipated monetary growth increases inflationary expectations, which may adversely affect real growth. A statistically significant increase in price inflation with respect to higher anticipated monetary growth is evident in forty countries. Price inflation responds negatively and significantly to anticipated monetary growth in five countries, indicating structural constraints that block the transmission mechanism of monetary policy to aggregate demand.

Expansionary monetary shocks increase real output growth significantly in eight countries and increase price inflation significantly in twenty-one countries. Contractionary monetary shocks decrease real output growth significantly in sixteen countries and decrease price inflation significantly in twenty-four countries. Clearly, the elasticity of aggregate demand to contractionary monetary shocks appears larger, compared to that with respect to expansionary shocks. Moreover, capacity constraints hinder output expansion and increase price inflation with respect to expansionary shocks, compared to contractionary shocks.

The parameters from the time-series models are further evaluated in the context of cross-section analysis that seeks to summarize the evidence and draw the relevant implications.

¹² For a few countries, the exchange rate was fixed over the sample period. Hence, the model is estimated without the exchange rate variable.

¹³ Estimates of the empirical models in (1) and (2) are available upon request. The parameters measuring price flexibility along the aggregate supply curve and the size of demand shifts in the face of monetary shocks are included in the cross-country regressions of the next section.

¹¹ Quarterly data are not available for a long time span for many of the countries under investigation.

Table 1
The real and inflationary effects of policy shocks.

Country	Var	Constant	EDh	EDg	EDm	Posh	Negh	Posg	Negg	Posm	Negm	R Squared
Albania	Dy	0.071* (2.26)	-0.28* (-3.19)	0.35 (1.56)	-0.048 (-0.20)	-0.071 (-0.20)	-0.63 (-1.22)	-0.42 (-0.88)	1.32* (2.75)	-1.023** (-1.89)	0.016 (0.04)	0.75
	Dp	0.004 (0.10)	0.069 (0.60)	0.74* (2.53)	0.45 (1.44)	0.22 (0.46)	0.19 (0.28)	0.28 (0.44)	1.47* (2.32)	-1.43* (-2.02)	0.36 (0.68)	0.95
Algeria	Dy	-0.022 (-0.56)	0.14 (1.17)	-0.15 (-1.33)	0.29 (1.26)	-0.24 (-1.53)	-0.007 (-0.03)	0.37** (1.82)	-0.30 (-1.12)	0.23 (0.72)	0.026 (0.10)	0.37
	Dp	0.15* (2.45)	-0.042 (-0.21)	0.82* (4.47)	-0.84* (-2.32)	0.83* (3.29)	-0.16 (-0.43)	-0.75* (-2.30)	1.50* (3.43)	-0.092 (-0.18)	0.32 (0.77)	0.78
Antigua and Barbuda	Dy	0.027** (1.92)	0.035 (0.09)	0.099 (1.15)	0.048 (0.51)	-0.80 (-1.08)	-0.86 (-1.30)	0.58 (1.53)	0.063 (0.26)	-0.41* (-2.09)	0.11 (0.46)	0.42
	Dp	-0.0054 (-0.25)	2.29* (3.67)	0.13 (1.02)	0.53* (3.74)	1.57 (1.39)	1.14 (1.14)	-0.23 (-0.40)	0.63** (1.69)	0.22 (0.73)	0.17 (0.45)	0.89
Argentina	Dy	0.06* (3.72)	-0.20* (-3.67)	0.36* (2.83)	-0.26* (-2.11)	0.014 (0.35)	-0.13* (-3.12)	-0.076 (-0.92)	-0.057 (-0.77)	0.033 (0.50)	0.10 (1.27)	0.65
	Dp	-0.038 (-0.81)	0.37* (2.29)	0.28 (0.74)	0.49 (1.37)	0.049 (0.42)	0.34* (2.77)	0.11 (0.47)	0.71* (3.30)	0.64* (3.28)	0.035 (0.15)	0.99
Bahrain	Dy	0.02 (0.91)	0.99 (0.55)	0.29* (2.96)	0.009 (0.05)	4.07 (1.07)	-2.17 (-0.73)	0.50 (1.50)	0.21 (0.63)	-0.22 (-1.46)	0.055 (0.39)	0.39
	Dp	-0.028 (-0.40)	-0.93 (-0.16)	0.24 (0.79)	-0.055 (-0.11)	14.21 (1.19)	-0.12 (-1.34)	0.47 (0.45)	0.13 (0.13)	-0.064 (-0.13)	0.60 (1.35)	0.86
Bangladesh	Dy	0.039* (3.86)	-0.037 (-0.71)	-0.0081 (-0.46)	0.04 (1.00)	-0.13 (-0.37)	-0.081 (-0.28)	-0.052 (-1.08)	-0.052 (-1.04)	0.062 (0.69)	-0.028 (-0.38)	0.52
	Dp	0.074 (1.44)	0.11 (0.43)	-0.12 (-1.32)	0.083 (0.41)	0.083 (0.04)	0.85 (0.59)	-0.20 (-0.80)	-0.059 (-0.23)	0.22 (0.48)	0.01 (0.03)	0.41
Barbados	Dy	-0.068** (-1.87)	-7.03* (-3.00)	0.09 (0.69)	0.21 (0.62)	-2.24 (-0.38)	-12.91* (-3.28)	0.44 (1.49)	-0.42 (-1.08)	0.47** (1.73)	0.034 (0.15)	0.68
	Dp	0.044 (0.82)	-5.22 (-1.50)	-0.30 (-1.58)	0.89** (1.75)	-7.22 (-0.82)	-0.85 (-0.15)	-0.18 (-0.40)	0.94 (1.62)	0.15 (0.37)	-0.055 (-0.17)	0.60
Belize	Dy	0.056* (2.86)	0.018 (0.08)	0.031 (0.41)	-0.26** (-1.83)	0.33 (0.97)	0.19 (0.42)	-0.06 (-0.72)	-0.11 (-0.73)	0.0027 (0.02)	-0.24 (-1.12)	0.30
	Dp	0.059 (0.92)	-0.69 (-0.92)	0.19 (0.79)	0.036 (0.08)	-0.52 (-0.47)	-1.56 (-1.07)	0.04 (0.15)	0.23 (0.48)	0.42 (0.73)	0.65 (0.93)	0.24
Benin	Dy	0.035* (2.08)	0.072 (0.96)	0.0057 (0.31)	0.053 (0.67)	-0.024 (-0.32)	0.054 (0.56)	-0.004 (-0.06)	-0.026 (-0.31)	-0.12 (-1.48)	0.018 (0.70)	0.17
	Dp	0.0052 (0.10)	-0.13 (-0.55)	0.035 (0.59)	0.20 (0.78)	0.071 (0.30)	0.23 (0.78)	0.30 (1.47)	0.15 (0.57)	0.35 (1.37)	-0.006 (-0.07)	0.28
Bolivia	Dy	0.039* (4.30)	-0.027 (-0.70)	0.014 (0.50)	-0.42 (-1.23)	0.019 (0.61)	-0.049 (-1.08)	0.0093 (0.17)	0.0099 (0.74)	0.0022 (0.04)	-0.031 (-0.92)	0.70
	Dp	-0.019 (-0.48)	0.69* (4.22)	0.24* (1.95)	0.032 (0.23)	0.62* (4.67)	0.94* (4.87)	0.46* (1.97)	-0.03 (-0.54)	0.064 (0.30)	-0.038 (-0.27)	0.99
Botswana	Dy	0.053 (1.08)	-0.17 (-1.05)	0.11 (0.95)	-0.17 (-0.73)	-0.10 (-0.34)	0.059 (0.16)	0.39* (2.03)	-0.15 (-1.49)	0.27 (0.75)	-0.08 (-0.19)	0.42
	Dp	0.11 (1.50)	0.081 (0.34)	-0.15 (-0.92)	-0.10 (-0.29)	0.088 (0.20)	-0.26 (-0.48)	0.065 (0.23)	-0.05 (-0.33)	0.085 (0.16)	-0.34 (-0.56)	0.41
Brazil	Dy	0.066* (3.69)	-0.0074 (-0.61)	-0.0045 (-0.30)	0.0033 (0.70)	0.019 (0.14)	0.032 (0.29)	-0.026 (-0.84)	0.01 (0.50)	-0.0021 (-0.59)	0.0028 (0.28)	0.20
	Dp	0.074 (0.76)	-0.031 (-0.47)	0.75* (9.02)	-0.015 (-0.19)	0.69 (0.92)	0.56 (0.95)	1.35* (7.90)	0.28* (2.60)	-0.0037 (-0.19)	0.043 (0.80)	0.95
Bulgaria	Dy	0.12* (4.10)	0.006 (0.38)	-0.079* (-3.81)	-0.16 (-1.38)	-0.29* (-2.77)	0.28* (2.89)	-0.30** (-1.93)	0.23 (1.42)	-0.20 (-1.01)	-0.033 (-0.15)	0.67
	Dp	-0.14** (-1.82)	-0.036 (-0.86)	1.064* (19.79)	0.11 (0.39)	0.69** (2.53)	-0.23 (-0.91)	1.32* (3.28)	0.92* (2.21)	0.57 (1.12)	0.0054 (0.01)	0.97
Burkina Faso	Dy	0.035 (0.77)	-0.087 (-0.91)	-0.34* (-2.21)	0.099 (0.36)	0.23 (1.43)	-0.21 (-0.91)	-0.049 (-0.39)	0.16 (0.72)	0.20 (0.82)	0.21 (0.56)	0.041
	Dp	0.065 (1.10)	0.079 (0.63)	0.31 (1.54)	-0.62** (-1.72)	-0.26 (-1.23)	0.20 (0.67)	0.60* (3.63)	-0.18 (-0.64)	-0.079 (-0.25)	-0.31 (-0.62)	0.74
Burundi	Dy	0.035 (0.64)	-0.31 (-0.84)	-0.011 (-0.04)	0.08 (0.31)	-0.042 (-0.11)	-0.18 (-0.45)	-0.26 (-0.86)	0.22 (0.63)	0.0084 (0.06)	-0.048 (-0.31)	0.068
	Dp	0.066 (1.15)	-0.12 (-0.31)	0.20 (0.61)	0.059 (0.21)	-0.066 (-0.16)	0.094 (0.22)	0.54 (1.66)	0.13 (0.36)	-0.048 (-0.34)	0.20 (1.18)	0.28
Cameroon	Dy	0.052** (1.79)	0.36* (2.05)	0.027 (0.37)	0.30* (2.46)	-0.0039 (-0.03)	0.12 (0.60)	-0.19 (-1.44)	0.093 (1.03)	-0.40** (-1.87)	0.34* (2.41)	0.57
	Dp	0.056** (1.83)	0.27 (1.44)	0.015 (0.20)	0.27* (2.12)	-0.056 (-0.45)	-0.12 (-0.58)	-0.055 (-0.40)	-0.12 (-1.28)	-0.26 (-1.15)	0.25 (1.66)	0.56
Cape Verde	Dy	0.06 (1.17)	-0.03 (-0.08)	0.0058 (0.04)	-0.36 (-0.91)	-0.042 (-0.08)	0.041 (0.10)	0.28 (1.18)	-0.05 (-0.15)	-0.062 (-0.13)	-0.082 (-0.14)	0.29
	Dp	0.089* (3.04)	0.69* (3.22)	-0.0031 (-0.04)	-0.20 (-0.86)	0.047 (0.16)	-0.12 (-0.53)	-0.056 (-0.41)	-0.029 (-0.15)	0.23 (0.86)	0.51 (1.55)	0.74
Central African Republic	Dy	0.024 (1.23)	0.20** (1.75)	0.014 (0.20)	-0.077 (-0.52)	-0.23** (-1.83)	0.25** (1.81)	0.28* (2.84)	-0.043 (-1.52)	-0.0021 (-0.02)	0.086 (0.59)	0.36
	Dp	0.069* (2.09)	0.092 (0.48)	0.18 (1.59)	-0.019 (-0.08)	0.21 (1.00)	0.11 (0.49)	0.39* (2.29)	-0.079 (-1.66)	-0.27 (-1.20)	0.47** (1.88)	0.39
Chad	Dy	0.012 (0.41)	-0.36* (-2.02)	0.22 (1.01)	0.11 (0.82)	0.27** (1.76)	-0.20 (-1.04)	-0.052 (-0.41)	0.60* (3.26)	-0.25 (-1.19)	-0.13 (-0.69)	0.50
	Dp	0.012 (0.33)	1.074* (4.52)	0.12 (0.43)	0.081 (0.46)	0.26 (1.31)	0.22 (0.87)	0.067 (0.39)	0.14 (0.58)	0.25 (0.93)	0.28 (1.14)	0.75
Chile	Dy	0.025 (1.23)	-0.14* (-3.17)	0.082* (2.42)	0.02 (0.43)	-0.16* (-2.65)	-0.22* (-2.22)	0.071 (0.97)	-0.046 (-1.49)	0.11 (0.78)	0.17 (0.18)	0.59
	Dp	-0.027 (-0.78)	0.53* (7.19)	0.11** (1.93)	0.36* (4.45)	0.43* (4.28)	0.42* (2.47)	-0.095 (-0.75)	0.096** (1.81)	0.16 (0.65)	0.20 (1.18)	0.98
China, P.R. Mainland	Dy	-0.056** (-1.77)	0.19 (1.29)	-0.16 (-1.07)	0.81* (4.03)	0.054 (0.66)	0.079 (0.52)	0.079 (0.43)	-0.016 (-0.07)	0.016 (0.10)	0.11 (0.60)	0.75
	Dp	-0.062 (-1.42)	0.33 (1.66)	0.61* (3.04)	0.063 (0.23)	0.23* (2.02)	-0.13 (-0.60)	0.21 (0.82)	0.25 (0.79)	-0.34 (-1.45)	0.23 (0.94)	0.86
Colombia	Dy	0.05** (1.85)	-0.31* (-2.53)	0.021 (1.20)	0.14 (1.04)	-0.20 (-1.19)	0.086 (0.55)	0.065 (1.41)	-0.015 (-1.05)	0.17 (1.37)	0.10 (0.89)	0.44
	Dp	-0.013 (-0.17)	0.24 (0.71)	0.0012 (0.02)	0.61** (1.70)	0.47 (0.99)	-0.42 (-0.96)	-0.0053 (-0.04)	0.03 (0.77)	0.56 (1.65)	-0.081 (-0.26)	0.43
Comoros	Dy	-0.053* (-2.35)	-0.089 (-0.70)	-0.20 (-1.65)	0.32* (2.93)	-0.21* (-2.20)	-0.32* (-2.06)	-0.038 (-0.12)	0.23 (0.59)	1.23* (2.25)	-1.59* (-2.69)	0.77
	Dp	0.071* (2.24)	0.24 (1.34)	0.24 (1.44)	-0.15 (-0.98)	0.16 (-1.18)	-0.039 (-0.17)	-0.24 (-0.52)	0.14 (0.26)	-0.66 (-0.85)	1.013 (1.21)	0.66
Congo, Democratic Republic of	Dy	0.038* (2.15)	0.071 (1.46)	-0.10** (-1.74)	-0.022 (-0.79)	0.054 (1.56)	0.016 (0.34)	-0.036 (-0.71)	-0.056 (-0.63)	-0.0067 (-0.18)	-0.018 (-0.51)	0.58
	Dp	-0.0066 (-0.14)	0.76* (6.06)	0.096 (0.62)	0.075 (1.04)	0.72* (7.91)	0.48* (4.03)	0.56* (4.16)	-0.19 (-0.82)	-0.16 (-1.64)	0.23* (2.52)	0.99
Congo, Republic of	Dy	0.039 (1.30)	-0.35 (-1.43)	-0.19 (-1.67)	0.25 (1.61)	-0.25* (-2.45)	0.17 (1.01)	-0.10 (-0.99)	-0.0096 (-0.21)	0.25 (1.54)	-0.25 (-1.65)	0.34
	Dp	0.051 (1.44)	-0.56** (-1.80)	0.10 (0.75)	-0.11 (-0.60)	0.28* (2.34)	-0.12 (-0.61)	0.13 (1.07)	0.069 (1.27)	0.40* (2.05)	0.52* (2.86)	0.65
Costa Rica	Dy	0.073* (3.61)	-0.17* (-2.48)	-0.11 (-1.38)	-0.0085 (-0.17)	0.0055 (0.14)	-0.27* (-2.96)	0.017 (0.11)	0.12 (0.76)	0.074 (1.01)	-0.082 (-1.00)	0.66
	Dp	-0.0056 (-0.10)	0.65* (3.37)	0.67* (2.96)	0.0085 (0.06)	0.11 (0.96)	0.55* (2.22)	0.44 (1.01)	-0.17 (-0.37)	-0.33 (-1.62)	0.42** (1.86)	0.81

(continued on next page)

Table 1 (continued)

Country	Var	Constant	EDh	EDg	EDm	Posh	Negh	Posg	Negg	Posm	Negm	R Squared
Cote D'Ivoire	Dy	0.013 (0.99)	-0.25* (-2.16)	0.088* (2.81)	0.21* (2.52)	-0.0041 (-0.07)	-0.029 (-0.51)	0.051 (1.02)	-0.015 (-1.18)	0.032 (0.41)	0.03 (0.32)	0.67
	Dp	-0.052* (-2.58)	0.64* (3.52)	0.055 (1.13)	0.67* (5.13)	0.054 (0.58)	0.16** (1.76)	0.14** (1.73)	0.0041 (0.20)	0.57* (4.68)	0.13 (0.85)	0.86
Cyprus	Dy	0.097* (2.33)	0.37 (1.40)	-0.14* (-2.67)	0.42 (1.47)	-0.47** (-1.71)	-0.21 (-0.80)	-0.31* (-3.06)	0.046 (1.50)	-0.14 (-0.66)	1.37* (3.89)	0.57
	Dp	0.006 (0.21)	0.12 (0.65)	0.058 (1.63)	0.21 (1.06)	0.11 (0.60)	-0.15 (-0.79)	0.08 (1.17)	-0.012 (-0.58)	0.057 (0.39)	0.023 (0.09)	0.22
Dominica	Dy	0.036 (1.25)	1163005 (1.53)	0.34 (0.82)	-0.032 (-0.27)	1163025 (1.53)	1163007 (1.53)	-0.99* (-2.78)	-0.39 (-1.05)	-0.092 (-0.47)	0.26 (1.07)	0.69
	Dp	0.026* (2.26)	408089.6 (1.34)	0.23 (1.35)	0.02 (0.44)	408086.9 (1.34)	408088.4 (1.34)	0.08 (0.56)	0.40* (2.65)	0.0047 (0.06)	-0.0078 (-0.08)	0.78
Dominican Republic	Dy	0.062* (3.05)	-0.052 (-0.63)	0.0015 (0.02)	-0.045 (-0.46)	-0.059 (-1.02)	-0.032 (-0.32)	0.07 (1.41)	-0.049** (-1.72)	-0.25** (-1.75)	-0.03 (-0.22)	0.48
	Dp	-0.049 (-1.15)	0.72* (4.06)	-0.078 (-0.58)	0.73* (3.53)	0.036 (0.29)	0.47* (2.18)	0.038 (0.37)	-0.0041 (-0.07)	0.74* (2.46)	0.23 (0.83)	0.72
Ecuador	Dy	0.093* (4.28)	0.0093 (0.15)	-0.16** (-1.74)	-0.02 (-0.58)	-0.19* (-2.37)	-0.066* (-0.49)	0.063 (0.60)	-0.028 (-0.13)	0.04 (0.75)	0.081 (1.37)	0.50
	Dp	0.00065 (0.02)	0.38* (3.51)	0.56* (3.49)	0.097 (1.59)	0.40* (2.89)	0.15 (2.00)	0.15 (0.86)	-0.035 (-0.09)	-0.0054 (-0.06)	0.13 (1.26)	0.87
Egypt	Dy	0.00 (0.00)	-0.50* (-2.88)	0.52* (2.07)	-0.21 (1.18)	0.095 (1.57)	-0.68* (-3.49)	0.14 (0.43)	0.12 (0.41)	0.06 (0.33)	-0.075 (-0.28)	0.48
	Dp	0.024 (0.35)	0.75* (2.38)	0.067 (0.15)	0.21 (0.66)	0.14 (1.23)	0.77* (2.17)	0.77 (1.33)	-0.23 (-0.44)	0.30 (0.90)	0.14 (0.30)	0.69
El Salvador	Dy	-0.045 (-1.62)	-0.048 (-0.21)	-0.22* (-1.79)	0.65* (3.02)	-0.054 (-0.21)	-0.34 (-0.63)	-0.094 (-0.96)	0.00028 (0.01)	0.23 (0.87)	-0.19 (-0.74)	0.37
	Dp	0.041 (1.50)	0.31 (1.35)	0.15 (1.24)	0.22 (1.03)	0.92* (3.61)	-0.13 (-0.24)	-0.036 (-0.37)	0.026 (1.03)	0.19 (0.71)	0.46** (1.77)	0.78
Ethiopia	Dy	0.03 (0.98)	0.056 (0.35)	0.17 (1.20)	-0.27 (-1.42)	0.17 (1.54)	-0.44 (-1.52)	-0.012 (-0.08)	-0.013 (-0.27)	-0.13 (-0.42)	-0.084 (-0.37)	0.35
	Dp	0.034 (0.83)	0.41** (1.86)	-0.31 (-1.64)	0.13 (0.52)	-0.037 (-0.25)	0.88* (2.27)	0.16 (0.80)	0.0086 (0.13)	0.39 (0.97)	-0.088 (-0.29)	0.33
Fiji	Dy	0.055* (2.18)	-0.046 (-0.10)	-0.0044 (-0.02)	0.041 (0.26)	-0.93* (-2.26)	0.15 (0.29)	-0.056 (-0.23)	0.25 (1.21)	0.094 (0.50)	-0.042 (-0.21)	0.30
	Dp	0.049* (2.43)	0.077 (0.22)	0.21 (1.38)	-0.20 (-1.56)	0.20 (0.61)	0.21 (0.51)	-0.07 (-1.36)	-0.11 (-0.66)	0.038 (0.26)	0.0033 (0.02)	0.21
Gabon	Dy	0.036 (1.01)	-0.35 (-0.37)	-0.0054 (-0.04)	0.36* (2.27)	-0.098 (-0.62)	-0.046 (-0.19)	-0.35* (-2.03)	0.048 (0.59)	0.35 (1.40)	0.50* (2.04)	0.48
	Dp	0.0019 (0.04)	0.21 (0.18)	-0.16 (-0.85)	0.18 (0.91)	0.57* (2.92)	-0.45 (-1.55)	0.26 (1.23)	0.038 (0.38)	-0.098 (-0.32)	0.35 (1.14)	0.43
Gambia	Dy	0.055* (2.04)	-0.14 (-0.63)	0.064 (0.64)	-0.20* (-2.01)	0.19 (0.73)	-0.12 (-0.46)	0.17 (1.25)	0.10** (1.75)	0.022 (0.19)	-0.0017 (-0.02)	0.40
	Dp	0.014 (0.48)	0.17 (0.74)	0.26* (2.47)	-0.013 (-0.12)	0.24 (0.89)	0.29 (1.10)	0.40* (2.78)	-0.20* (-3.25)	0.098 (0.80)	0.069 (0.61)	0.58
Ghana	Dy	0.053* (1.96)	0.024 (0.48)	-0.0074 (-0.27)	0.082 (0.70)	-0.088** (-1.75)	0.20* (2.66)	0.042 (0.76)	-0.0057 (-0.29)	-0.36* (-3.16)	0.34* (2.70)	0.42
	Dp	-0.039 (-0.54)	-0.23 (-1.68)	0.039 (0.54)	1.20* (3.87)	0.33* (2.47)	-0.15 (-0.74)	-0.01 (-0.11)	0.018 (0.34)	0.26 (0.86)	0.50 (1.50)	0.69
Grenada	Dy	0.057* (4.49)	0.26 (0.54)	-0.0038 (-0.09)	-0.033 (-0.35)	0.22 (0.78)	0.87 (1.18)	-0.035 (-0.91)	0.04 (0.99)	-0.032 (-0.19)	-0.094 (-0.64)	0.36
	Dp	0.091* (3.63)	3.28* (3.51)	0.00 (0.00)	0.10 (0.54)	-0.83 (-1.50)	3.37* (2.36)	-0.13** (-1.70)	0.095** (1.21)	-0.039 (-0.12)	0.27 (0.93)	0.63
Guatemala	Dy	0.03 (1.47)	-0.12 (-1.28)	0.096 (0.92)	0.12 (0.93)	-0.12* (-2.11)	0.25 (1.68)	0.076 (0.56)	-0.0021 (-0.02)	-0.0073 (-0.09)	0.14 (0.89)	0.41
	Dp	-0.045 (-1.20)	0.10 (0.62)	0.26 (1.36)	0.59* (2.43)	0.52* (5.20)	-0.49** (-1.83)	0.03 (0.12)	-0.12 (-0.63)	0.054 (0.36)	0.62* (2.17)	0.81
Guinea	Dy	0.045* (2.41)	0.019 (0.17)	-0.055 (-0.51)	0.072 (0.91)	0.11 (0.70)	0.12 (0.62)	-0.07 (-0.49)	0.029 (0.41)	-0.083 (-1.23)	0.18 (1.45)	0.20
	Dp	-0.05 (-1.25)	0.33 (1.39)	0.028 (0.12)	0.54* (3.17)	0.90* (2.55)	-0.13 (-0.31)	-0.07 (-0.23)	0.07 (0.46)	0.24 (1.68)	-0.29 (-1.05)	0.84
Guinea Bissau	Dy	0.023 (0.70)	0.054 (0.59)	0.22 (1.42)	-0.18 (-1.66)	0.057 (0.87)	-0.15 (-0.77)	0.24** (1.71)	-0.022 (-0.55)	-0.087 (-0.53)	0.39* (1.95)	0.30
	Dp	0.089 (1.59)	0.026 (0.16)	0.73* (2.73)	0.04 (0.21)	-0.15 (-1.31)	0.67* (1.95)	0.80* (3.31)	-0.010 (-0.16)	-0.57* (-2.02)	0.62** (1.77)	0.62
Haiti	Dy	0.00 (0.00)	-0.47* (-2.43)	0.14* (2.20)	-0.077 (-0.89)	-0.37 (-1.58)	-0.05 (-0.16)	0.18* (2.38)	-0.039** (-1.75)	0.19 (1.42)	-0.17 (-1.08)	0.48
	Dp	0.034 (1.29)	1.093* (3.38)	0.22* (2.18)	-0.081 (-0.57)	-0.01 (-0.03)	0.48 (0.92)	0.34* (2.67)	-0.024 (-0.65)	0.033 (0.15)	-0.053 (-0.32)	0.60
Honduras	Dy	0.028 (1.12)	-0.01 (-0.06)	-0.036 (-0.94)	0.075 (0.34)	-0.075 (-1.43)	-0.032 (-0.12)	0.013 (0.19)	0.016 (0.73)	0.13 (0.84)	0.043 (0.24)	0.16
	Dp	0.021 (0.96)	0.99* (6.75)	0.072* (2.18)	-0.001 (-0.01)	0.16* (3.59)	0.43** (1.82)	0.11** (1.80)	0.014 (0.74)	0.18 (1.34)	0.06 (0.39)	0.86
Hungary	Dy	0.095* (5.94)	-0.13 (-1.42)	0.13 (1.09)	-0.36* (-2.89)	-0.85* (-3.83)	0.68* (3.09)	-1.02* (-3.76)	0.24 (1.11)	0.33 (1.61)	-0.98* (-2.99)	0.72
	Dp	-0.009 (-0.62)	0.60* (7.82)	-0.042 (-0.41)	0.36* (3.32)	0.66* (3.42)	-0.17 (-0.88)	1.20* (5.18)	-0.71* (-3.80)	0.047 (0.27)	1.12* (4.01)	0.94
India	Dy	0.008 (0.19)	0.26 (1.54)	0.14 (0.53)	-0.003 (-0.02)	-0.13 (-0.87)	0.091 (0.38)	0.10 (0.30)	0.074 (0.18)	0.11 (0.46)	-0.23 (-0.88)	0.15
	Dp	0.23* (4.62)	0.54* (2.66)	-0.23 (-0.73)	-1.03* (-4.44)	0.14 (0.81)	0.09 (0.32)	-0.038 (-0.09)	0.34 (0.68)	-0.24 (-0.81)	0.96* (3.10)	0.56
Indonesia	Dy	0.071* (5.09)	0.14* (2.31)	-0.014 (-0.79)	-0.047 (-0.94)	-0.19* (-9.08)	0.14** (1.89)	0.034 (1.38)	-0.022 (-0.93)	0.067 (0.79)	0.099 (0.81)	0.82
	Dp	-0.068 (-1.46)	0.93* (4.57)	-0.12* (-2.03)	0.33* (2.01)	0.43* (6.25)	-0.58* (-2.34)	0.087 (1.06)	-0.054 (-0.70)	0.29 (1.02)	0.82* (2.01)	0.86
Iran	Dy	0.25* (3.44)	0.14 (0.45)	-0.009 (-0.10)	-1.03* (-2.42)	-0.083 (-0.36)	-0.098 (-0.32)	0.015 (0.08)	-0.011 (-0.11)	-0.098 (-0.26)	-0.34 (-0.64)	0.39
	Dp	-0.12 (-1.39)	-0.53 (-1.49)	-0.025 (-0.24)	1.75* (3.65)	0.81* (3.12)	0.24 (0.69)	-0.66* (-2.93)	-0.12 (-1.01)	0.26 (0.59)	0.97 (1.64)	0.71
Jamaica	Dy	0.056** (1.91)	0.17 (1.63)	-0.074 (-0.96)	-0.074 (-0.66)	-0.12 (-1.62)	0.16 (1.61)	-0.021 (-0.29)	-0.023 (-0.22)	-0.13 (-1.41)	0.16 (0.98)	0.27
	Dp	-0.11* (-1.86)	-0.059 (-0.29)	0.22 (1.44)	0.60* (2.75)	0.52* (3.55)	-0.30 (-1.53)	0.27** (1.88)	-0.20 (-0.92)	0.53* (2.97)	-0.21 (-0.67)	0.83
Jordan	Dy	0.073** (1.72)	0.016 (0.06)	-0.028 (-0.56)	0.19 (0.80)	-0.70* (-3.36)	0.15 (0.37)	-0.17 (-1.55)	-0.05 (-1.15)	-0.58 (-1.32)	0.33 (0.85)	0.42
	Dp	-0.011 (-0.48)	-0.0023 (-0.02)	-0.041 (-1.44)	0.63* (4.78)	0.38* (3.25)	-0.15 (-0.68)	0.013 (0.22)	0.025 (1.03)	0.24 (0.96)	0.11 (0.49)	0.67
Kenya	Dy	0.05* (2.17)	-0.25* (-2.76)	-0.008 (-0.14)	-0.10 (-0.80)	0.00 (0.00)	-0.15 (-1.09)	0.033 (0.52)	-0.20* (-3.50)	0.067 (0.80)	-0.12 (-0.99)	0.60
	Dp	0.054 (1.48)	0.22 (1.52)	0.011 (0.13)	0.071 (0.34)	0.22** (1.74)	-0.30 (-1.39)	-0.072 (-0.69)	0.023 (0.26)	0.25* (1.82)	0.068 (0.35)	0.55
Kuwait	Dy	-0.015 (-0.17)	-3.53 (-1.42)	0.0067 (0.03)	-2.52** (-1.81)	-0.18 (-0.05)	1.62 (0.54)	-0.13 (-0.28)	0.065 (0.22)	0.31 (0.80)	-1.01** (-1.83)	0.41
	Dp	0.043 (0.28)	-2.39 (-0.56)	-0.12 (-0.34)	0.26 (0.52)	0.38 (0.06)	-0.35 (-0.07)	0.045 (0.06)	-0.23 (-0.44)	0.057 (0.08)	0.57 (0.60)	0.21
Lao People's Dem. Rep.	Dy	0.11* (5.39)	0.035 (0.88)	-0.11 (-1.04)	-0.077 (-1.51)	-0.042** (-1.69)	0.082 (1.27)	-0.029 (-0.61)	0.18* (2.11)	0.11** (1.69)	-0.049 (-0.58)	0.59
	Dp	-0.049 (-0.59)	0.15 (0.93)	0.92* (2.14)	0.28 (1.31)	-0.071 (-0.70)	0.21 (0.78)	0.76* (3.83)	0.60** (1.70)	0.074 (0.27)	0.45 (1.30)	0.83

Lebanon	Dy	0.31* (3.38)	0.37 (1.33)	0.25 (1.64)	-0.51 (-1.44)	-0.091 (-0.21)	1.93* (2.88)	-0.27 (-0.88)	0.57* (2.17)	-1.77** (-1.71)	-0.62 (-1.20)	0.49
	Dp	-0.08* (-2.61)	0.36* (3.92)	0.084 (1.65)	0.71* (6.16)	0.61* (4.22)	0.42** (1.93)	0.35* (3.41)	-0.01 (-0.12)	1.16* (3.43)	-0.025 (-0.15)	0.97
Lesotho	Dy	0.0021 (0.04)	-0.15 (-0.66)	0.55* (2.85)	0.14 (0.48)	-0.081 (-0.47)	0.35 (1.54)	-0.25 (-1.58)	0.071 (0.41)	0.0018 (0.01)	1.10* (7.20)	0.78
	Dp	0.05* (2.28)	0.04 (0.40)	-0.14** (-1.85)	0.48* (4.22)	0.0044 (0.06)	-0.03 (-0.37)	0.15* (2.38)	-0.09 (-1.34)	-0.02 (-0.22)	-0.13* (-2.12)	0.60
Liberia	Dy	0.02 (1.07)		-0.02 (-0.66)	0.05 (2.85)			-0.08* (-2.33)	-0.002 (-0.08)	0.40 (1.20)	0.18 (1.24)	0.35
	Dp	0.07* (3.54)		0.012 (0.37)	-0.19 (-1.31)			0.004 (0.11)	-0.02 (-0.71)	0.39 (1.13)	0.0021 (0.01)	0.20
Libya	Dy	0.024 (0.44)	-1.04 (-1.48)	0.045 (0.22)	0.31** (1.75)	-0.80 (-1.47)	0.14 (0.27)	0.36 (1.17)	0.012 (0.06)	-0.28 (-0.99)	0.33 (0.98)	0.44
	Dp	0.062 (0.90)	0.81 (0.92)	0.30 (1.17)	-0.075 (-0.34)	0.36 (0.54)	0.73 (1.12)	-0.058 (-0.15)	0.32 (1.23)	0.24 (0.66)	0.66 (1.54)	0.31
Macedonia, FYR	Dy	0.077* (5.09)	0.012 (0.55)	-0.086* (-3.14)	-0.006 (-0.18)	-0.07** (-1.81)	0.063 (1.56)	0.051 (0.51)	-0.05 (-0.90)	0.015 (0.34)	0.005 (0.13)	0.77
	Dp	-0.11* (-2.68)	0.009 (0.15)	0.98* (13.18)	0.084 (0.91)	0.056 (0.57)	0.089 (0.81)	0.62* (2.29)	0.60* (4.04)	0.43* (3.78)	-0.14 (-1.29)	0.98
Madagascar	Dy	0.041 (1.36)	-0.018 (-0.16)	0.036 (0.89)	-0.29 (-1.11)	-0.054 (-0.45)	0.00 (0.00)	0.11 (1.34)	-0.026 (-0.50)	-0.013 (-0.07)	-0.061 (-0.35)	0.21
	Dp	0.075 (1.53)	0.76* (4.02)	-0.076 (-1.16)	-0.25 (-0.76)	0.41* (2.07)	0.087 (0.49)	-0.083 (-0.64)	0.011 (0.13)	0.18 (0.59)	0.0086 (0.03)	0.63
Malaysia	Dy	0.076* (3.30)	-0.30 (-1.40)	0.12 (1.04)	0.48* (3.97)	-0.001 (-0.01)	-0.0035 (-0.04)	-0.032 (-0.56)	-0.10 (-1.28)	0.11 (0.73)	0.054 (0.30)	0.76
	Dp	0.07** (1.73)	-0.89* (-2.36)	0.094 (0.67)	-0.42 (-1.44)	0.21 (0.78)	-0.27 (-0.87)	0.063 (0.63)	-0.28* (-2.06)	-0.058 (-0.28)	0.17 (0.81)	0.39
Maldives	Dy	0.04 (1.28)	-0.066 (-0.50)	-0.078 (-0.57)	0.25* (2.15)	-0.089 (-0.71)	-0.021 (-0.11)	0.21** (1.76)	-0.15 (-1.63)	-0.002 (-0.02)	0.50* (3.28)	0.63
	Dp	0.054 (1.07)	0.11 (0.51)	0.40** (1.81)	-0.24 (-1.27)	0.062 (0.30)	0.089 (0.29)	0.058 (0.30)	0.19 (1.28)	0.37* (2.05)	0.043 (0.17)	0.45
Mail	Dy	-0.11* (-2.07)	-0.16 (-0.52)	1.26* (2.46)	-0.047 (-0.21)	-0.061 (-0.50)	-0.13 (-0.96)	0.34** (1.76)	-0.24 (-0.95)	-0.039 (-0.22)	-0.24 (-1.10)	0.38
	Dp	0.066 (1.02)	0.045 (0.11)	-0.27 (-0.43)	0.11 (0.39)	0.33* (2.18)	-0.12 (-0.71)	0.54* (2.27)	0.24 (0.78)	0.089 (0.42)	0.63* (2.45)	0.69
Malta	Dy	0.011 (0.51)	0.12 (0.43)	0.16 (1.52)	0.46* (3.25)	0.0056 (0.03)	0.058 (0.27)	-0.002 (-0.01)	-0.038 (-0.55)	0.31 (1.02)	-0.026 (-0.08)	0.42
	Dp	0.007 (0.42)	0.036 (0.17)	0.096 (1.18)	0.34* (3.08)	-0.051 (-0.40)	-0.28 (-1.67)	0.088 (0.72)	0.024 (0.46)	-0.21 (-0.91)	0.44** (1.76)	0.45
Mauritania	Dy	0.047 (1.57)	-0.0042 (-0.02)	-0.08* (-2.01)	-0.028 (-0.23)	0.0016 (0.01)	0.23 (0.67)	0.0022 (0.04)	0.022 (0.40)	0.38 (1.15)	-0.047 (-0.23)	0.58
	Dp	0.07* (1.77)	0.15 (0.50)	0.079 (1.58)	0.044 (0.29)	-0.05 (-0.21)	0.26 (0.62)	-0.031 (-0.47)	-0.023 (-0.33)	-0.50 (-1.21)	0.17 (0.71)	0.50
Mauritius	Dy	0.052 (1.63)	-0.21 (-0.74)	-0.026 (-1.24)	0.21 (-1.28)	-0.21 (-0.82)	0.15 (0.58)	0.011 (0.27)	-0.025 (-0.90)	-0.014 (-0.10)	0.32* (2.51)	0.39
	Dp	-0.031 (-1.09)	0.89* (3.58)	0.0039 (0.20)	0.59* (4.04)	-0.07 (-0.31)	0.17 (0.75)	-0.014 (-0.40)	0.023 (0.93)	0.26* (2.16)	-0.041 (-0.36)	0.57
Mexico	Dy	0.052* (4.27)	-0.15* (-4.26)	-0.025 (-0.34)	0.11 (1.17)	-0.12* (-3.92)	-0.09 (-1.35)	0.13 (1.42)	-0.08 (-0.89)	-0.01 (-0.26)	0.16* (2.38)	0.82
	Dp	-0.01 (-0.28)	0.44* (3.55)	0.64* (2.50)	0.064 (0.20)	0.13 (1.23)	0.56* (2.49)	0.33 (1.04)	0.10 (0.33)	0.07 (0.42)	0.25 (1.05)	0.92
Mongolia	Dy	0.06 (1.23)	-0.07 (-0.66)	-0.02 (-0.32)	0.03 (0.17)	-0.13 (-1.24)	0.13 (0.54)	-0.04 (-0.42)	-0.17 (-0.93)	0.002 (0.02)	0.04 (0.15)	0.61
	Dp	0.06 (0.32)	0.50 (1.18)	0.20 (0.85)	0.21 (0.27)	0.12 (0.27)	-0.35 (-0.34)	-0.27 (-0.59)	0.99 (1.26)	-0.04 (-0.06)	0.20 (0.18)	0.85
Morocco	Dy	0.08* (2.39)	-0.05 (-0.24)	0.23* (2.39)	-0.29 (-0.91)	-0.53* (-3.01)	0.36 (1.67)	0.20 (1.46)	-0.12** (-1.94)	0.18 (0.89)	0.94* (3.09)	0.53
	Dp	-0.06* (-2.09)	0.27 (1.40)	-0.008 (-1.10)	0.93* (3.49)	0.23 (1.55)	-0.05 (-0.27)	-0.15 (-1.26)	0.04 (0.84)	0.27 (1.54)	0.034 (0.13)	0.50
Mozambique	Dy	0.04 (1.49)	0.04 (0.27)	0.40** (1.75)	-0.51** (-1.84)	-0.17 (-1.15)	-0.010 (-0.07)	0.55** (1.93)	-0.10* (-1.98)	-0.32 (-1.00)	0.06 (0.20)	0.29
	Dp	-0.006 (-0.24)	0.37* (2.38)	0.17 (0.73)	0.42 (1.45)	0.37* (2.34)	0.41* (2.71)	0.23 (0.76)	-0.02 (-0.31)	-0.29 (-0.85)	0.33 (1.05)	0.93
Myanmar	Dy	0.07* (3.63)	0.61 (1.67)	0.24 (1.39)	-0.27* (-2.55)	0.00 (0.00)	-0.23 (-0.86)	0.08 (0.55)	0.03 (0.30)	-0.33* (-2.25)	0.23* (2.66)	0.48
	Dp	-0.067 (-1.59)	0.11 (0.13)	0.054 (0.13)	0.56* (2.24)	0.33 (0.85)	-0.094 (-0.15)	0.73* (2.09)	-0.17 (-0.75)	0.65** (1.89)	-0.25 (-1.26)	0.55
Namibia	Dy	0.096 (1.33)	-0.14 (-0.90)	-0.20 (-1.38)	-0.11 (-0.40)	-0.16 (-1.31)	-0.037 (-0.20)	-0.30 (-1.16)	-0.018 (-0.13)	-0.048 (-0.08)	0.0014 (0.001)	0.32
	Dp	-0.023 (-0.27)	0.02 (0.11)	-0.40* (-2.34)	0.65* (1.97)	0.31* (2.21)	-0.22 (-1.03)	-0.47 (-1.56)	-0.19 (-1.23)	0.72 (0.97)	0.043 (0.12)	0.52
Nepal	Dy	0.0004 (0.01)	0.17 (0.78)	0.017 (0.40)	0.14 (0.47)	-0.022 (-0.16)	0.03 (0.11)	0.025 (0.37)	-0.0058 (-0.15)	0.12 (0.48)	0.061 (0.31)	0.14
	Dp	0.087 (1.42)	0.046 (0.13)	-0.072 (-1.01)	0.0019 (0.001)	-0.022 (-0.10)	-0.34 (-0.78)	-0.0043 (-0.04)	0.10 (1.60)	0.026 (0.06)	-0.15 (-0.46)	0.24
Nicaragua	Dy	0.059* (2.54)	0.085 (1.36)	-0.02 (-0.46)	-0.06 (-1.36)	0.019 (0.41)	0.006 (0.12)	-0.017 (-0.22)	0.075* (2.48)	-0.17* (-2.28)	-0.024 (-0.31)	0.49
	Dp	0.085 (0.97)	0.62* (2.64)	0.27 (1.60)	0.41* (2.50)	-0.14 (-0.77)	0.71* (3.63)	0.57** (1.94)	0.26* (2.32)	0.34 (1.22)	0.65* (2.24)	0.98
Niger	Dy	-0.017 (-0.37)	-0.92 (-1.20)	0.29 (0.75)	0.29 (0.96)	-0.054 (-0.42)	-0.038 (-0.18)	0.58 (1.42)	0.39 (0.73)	0.063 (0.21)	-0.27 (-1.05)	0.37
	Dp	-0.031 (-1.11)	-0.46 (-1.00)	0.37 (1.55)	0.25 (1.33)	0.30* (3.82)	-0.12 (-0.92)	0.35 (1.43)	0.57** (1.76)	0.68* (3.79)	-0.20 (-1.32)	0.75
Nigeria	Dy	0.024 (0.46)	-0.0062 (-0.03)	0.04 (0.19)	0.29 (1.16)	-0.21 (-1.17)	0.032 (0.13)	-0.12 (-0.71)	0.029 (0.11)	-0.045 (-0.25)	0.44* (1.99)	0.22
	Dp	0.0032 (0.05)	0.29 (1.30)	0.083 (0.32)	0.49 (1.59)	0.33 (1.54)	0.76* (2.45)	0.24 (1.12)	-0.23 (-0.69)	0.17 (0.79)	0.36 (1.34)	0.61
Oman	Dy	0.042** (1.75)	-0.41 (-0.31)	-0.0006 (-0.01)	0.41* (3.36)	1.19 (1.53)	1.26** (1.73)	-0.004 (-0.02)	-0.017 (-0.11)	0.087 (0.20)	1.07* (3.44)	0.65
	Dp	-0.013 (-0.30)	-2.80 (-1.16)	-0.025 (-0.20)	0.59* (2.62)	-1.18 (-0.83)	-0.95 (-0.71)	0.53** (1.71)	0.25 (0.93)	-0.85 (-1.09)	0.23 (0.41)	0.46
Pakistan	Dy	0.03 (1.37)	-0.12 (-0.99)	0.067 (0.70)	0.17 (1.42)	-0.063 (-0.94)	0.14 (1.00)	0.49* (2.98)	-0.017 (-0.26)	-0.24** (-1.70)	0.40* (3.69)	0.58
	Dp	0.025 (0.60)	0.23 (0.95)	0.72* (3.80)	-0.39 (-1.67)	-0.01 (-0.08)	-0.11 (-0.38)	0.26 (0.83)	-0.077 (-0.61)	0.042 (0.15)	0.066 (0.31)	0.52
Panama	Dy	0.044* (3.47)		0.067 (0.78)	0.16 (1.50)			0.0061 (0.07)	0.023 (0.21)	-0.021 (-0.18)	0.35* (3.27)	0.44
	Dp	0.014 (1.35)		0.19* (2.59)	-0.18* (-2.01)			0.13** (1.70)	-0.032 (-0.33)	0.10 (1.07)	0.039 (0.44)	0.26
Papua New Guinea	Dy	0.038 (0.77)	-0.32 (-1.43)	-0.017 (-0.18)	0.29 (0.56)	-0.15 (-1.01)	-0.13 (-0.63)	-0.079 (-0.73)	0.01 (0.19)	-0.18 (-0.68)	0.57 (1.52)	0.25
	Dp	0.039 (0.64)	0.026 (0.09)	0.0043 (0.04)	-0.044 (-0.07)	0.51* (2.92)	-0.018 (-0.07)	0.015 (0.11)	-0.026 (-0.40)	0.67* (2.15)	0.11 (0.24)	0.45
Paraguay	Dy	0.035 (1.49)	-0.11** (-1.73)	0.055 (1.29)	-0.044 (-0.38)	0.068 (0.70)	-0.11 (-0.67)	-0.11* (2.09)	-0.01 (-0.55)	0.16 (1.29)	0.099 (1.12)	0.42
	Dp	-0.0074 (-0.15)	-0.071 (-0.51)	0.14 (1.56)	0.70* (2.92)	0.097 (0.48)	-0.013 (-0.04)	0.044 (0.40)	0.00005 (0.001)	0.012 (0.05)	0.24 (1.28)	0.63
Peru	Dy	0.038* (3.64)	-0.063 (-1.68)	-0.027* (-2.85)	0.064** (1.87)	-0.17* (-3.10)	-0.12* (-2.68)	-0.013* (-2.51)	0.0028 (0.54)	0.14* (2.44)	0.06 (1.24)	0.77
	Dp	-0.005 (-0.13)	0.96* (7.07)	-0.023 (-0.69)	0.14 (1.12)	0.81* (4.08)	0.61* (3.61)	-0.011 (-0.59)	-0.019 (-1.04)	0.095 (0.45)	0.37* (2.30)	0.99

(continued on next page)

Table 1 (continued)

Country	Var	Constant	EDh	EDg	EDm	Posh	Negh	Posg	Negg	Posm	Negm	R Squared
Philippines	Dy	0.05** (1.71)	-0.56* (-2.61)	-0.09 (-1.44)	0.19 (1.55)	-0.08 (-0.85)	-0.18 (-1.11)	0.038 (0.32)	0.01 (0.44)	0.038 (0.31)	0.023 (0.14)	0.49
	Dp	0.094 (1.55)	0.73 (1.58)	0.24** (1.74)	-0.23 (-0.85)	0.32 (1.64)	0.17 (0.48)	-0.12 (-0.50)	0.049 (0.96)	-0.33 (-1.26)	0.48 (1.40)	0.49
Poland	Dy	0.058* (4.97)	-0.17* (-2.06)	0.06 (0.78)	0.06** (1.71)	-0.16 (-1.68)	-0.034 (-0.55)	0.11 (1.58)	0.071 (0.73)	-0.015 (-0.34)	0.088* (2.76)	0.66
	Dp	0.020 (0.81)	0.47* (2.72)	0.72* (4.37)	-0.085 (-1.24)	0.17 (0.83)	0.39* (2.97)	0.33* (2.22)	0.91* (4.45)	0.035 (0.38)	0.021 (0.03)	0.97
Qatar	Dy	0.024 (0.80)	-0.74 (-0.53)	0.01 (0.06)	-0.019 (-0.12)	2.26 (0.69)	-0.82 (-0.50)	0.54 (1.58)	0.34* (2.05)	-0.20 (-0.82)	0.062 (0.28)	0.49
	Dp	-0.037 (-0.61)	-2.05 (-0.72)	0.36 (1.03)	0.051 (0.16)	3.09 (0.45)	-0.21 (-0.65)	0.90 (1.27)	-0.81* (-2.39)	-0.37 (-0.73)	0.43 (0.97)	0.41
Russia	Dy	0.026* (2.26)	-0.065* (-3.52)	0.03 (0.78)	-0.096** (-1.70)	-0.015 (-0.70)	-0.16* (-3.38)	0.12 (1.46)	0.096 (0.95)	-0.043 (-0.43)	0.086 (0.91)	0.91
	Dp	-0.045** (-1.88)	0.20* (5.06)	0.41* (5.09)	0.64* (5.33)	0.16* (3.59)	0.23* (2.27)	0.25 (1.50)	0.36 (1.68)	0.47* (2.21)	0.61* (3.01)	0.99
Rwanda	Dy	0.055 (1.28)	0.18 (0.58)	0.21 (1.61)	0.014 (0.04)	-0.58* (-2.15)	-0.14 (-0.39)	-0.17 (-1.27)	0.44* (4.04)	-0.068 (-0.25)	0.13 (0.39)	0.82
	Dp	-0.092** (-2.47)	0.52* (1.98)	0.021 (0.19)	1.04* (3.70)	0.062 (0.27)	0.40 (1.23)	0.21** (1.80)	-0.05 (-0.51)	0.30 (1.31)	-0.38 (-1.35)	0.71
Sao Tome & Principe	Dy	0.058** (1.78)	-0.0059 (-0.05)	0.061 (0.32)	-0.15 (-1.04)	-0.20 (-1.03)	0.38* (2.14)	0.042 (0.29)	0.14 (1.13)	0.069 (0.57)	-0.30** (-1.71)	0.35
	Dp	-0.032 (-0.57)	0.59* (3.19)	0.082 (0.26)	0.38 (1.62)	0.55* (1.69)	-0.26 (-0.87)	0.18 (0.73)	0.069 (0.33)	-0.012 (-0.06)	0.58* (1.95)	0.82
Saudi Arabia	Dy	0.035 (1.64)	-1.83* (-2.93)	0.16 (1.19)	-0.10 (-0.69)	-0.24 (-0.14)	-0.50 (-0.28)	0.055 (0.31)	0.096 (0.47)	-0.012 (-0.04)	0.13 (0.39)	0.52
	Dp	-0.019 (-0.45)	-1.10 (-0.91)	0.54* (2.11)	-0.08 (-0.28)	-0.73 (-0.23)	1.74 (0.50)	0.25 (0.73)	0.75** (1.89)	0.53 (0.86)	-0.82 (-1.26)	0.55
Senegal	Dy	0.013 (0.49)	-0.11 (-0.58)	0.11 (0.81)	0.089 (0.39)	0.04 (0.37)	-0.062 (-0.45)	0.008 (0.04)	0.024 (0.57)	-0.007 (-0.04)	0.014 (0.08)	0.17
	Dp	0.001 (0.03)	-0.14 (-0.66)	0.38* (2.39)	0.015 (0.06)	0.13 (1.10)	-0.12 (-0.78)	0.45* (2.16)	-0.07 (-1.34)	0.26 (1.47)	-0.04 (-0.19)	0.17
Sierra Leone	Dy	0.048 (1.51)	-0.05 (-0.54)	0.065 (0.37)	-0.13 (-0.82)	-0.19 (-0.94)	0.03 (0.81)	-0.12* (-2.80)	0.18* (2.11)	0.19 (1.28)	-0.24** (-1.91)	0.45
	Dp	-0.0005 (-0.01)	0.42* (3.24)	-0.05 (-0.94)	0.79* (2.74)	0.13 (0.81)	0.44* (2.43)	-0.059 (-0.99)	-0.088 (-0.73)	0.16 (0.64)	0.36 (1.60)	0.91
Slovak Republic	Dy	0.064* (2.84)	-0.12* (-3.31)	0.56* (2.69)	-0.21 (-1.29)	-0.12 (-0.69)	0.12 (0.62)	-0.25 (-0.96)	0.40 (1.24)	-1.19** (-1.82)	0.64 (1.23)	0.88
	Dp	-0.062* (-2.58)	0.018 (0.47)	-0.53* (-2.38)	0.90* (5.30)	0.18 (0.98)	-0.047 (-0.23)	0.32 (1.15)	-0.62** (-1.81)	2.00* (2.88)	-0.60 (-1.07)	0.94
Slovenia	Dy	0.056* (7.32)	-0.072* (-2.52)	0.016 (0.48)	-0.016 (-0.41)	0.021 (0.60)	-0.042** (-1.71)	-0.023 (-0.26)	-0.01 (-0.15)	0.036 (0.82)	-0.042 (-1.14)	0.74
	Dp	-0.089* (-4.50)	0.048 (0.66)	0.96* (15.26)	0.095 (1.06)	-0.038 (-0.33)	0.13 (1.41)	0.89* (3.89)	0.75* (4.41)	0.33* (3.83)	0.0058 (0.06)	0.99
Solomon Islands	Dy	-0.012 (-0.53)	-0.096 (-0.47)	0.22 (1.39)	0.14 (0.68)	0.14 (1.00)	0.13** (1.81)	0.30* (2.23)	-0.028 (-0.60)	-0.33 (-1.25)	-0.054 (-0.25)	0.54
	Dp	0.071* (2.40)	-0.034 (-0.12)	-0.11 (-1.15)	0.31** (1.71)	0.098 (0.28)	0.32 (1.13)	-0.078 (-0.43)	0.065 (1.05)	0.19 (0.88)	-0.075 (-0.28)	0.58
South Africa	Dy	0.054* (2.70)	-0.097 (-0.87)	-0.026 (-0.20)	0.16 (1.17)	0.081 (0.88)	-0.21 (-1.48)	-0.017 (-0.12)	0.17 (0.98)	-0.014 (-0.17)	-0.014 (-0.14)	0.36
	Dp	-0.021 (-0.94)	0.12 (0.94)	0.65* (4.05)	-0.019 (-0.18)	-0.06 (-0.65)	-0.18 (-1.48)	0.66* (4.26)	-0.67* (-3.40)	0.042 (0.29)	-0.31* (-1.97)	0.71
Sri Lanka	Dy	0.041* (2.33)	-0.066 (-0.52)	0.012 (0.10)	-0.10 (-0.83)	0.019 (0.20)	-0.0056 (-0.27)	0.087* (2.05)	0.014 (0.23)	-0.04 (-0.62)	-0.21 (-1.31)	0.40
	Dp	0.11* (2.57)	0.14 (0.47)	-0.084 (-1.67)	0.11 (0.47)	0.027 (0.17)	0.50 (1.30)	-0.13 (-1.31)	0.12 (0.79)	-0.28 (-1.02)	0.17 (0.57)	0.32
St. Kitts and Nevis	Dy	0.03** (1.86)	-0.15 (-0.37)	-0.039 (-1.01)	0.14 (1.27)	0.039 (0.25)	-0.15 (-0.33)	-0.034 (-0.73)	0.0099 (0.35)	0.27* (1.95)	0.039 (0.53)	0.31
	Dp	-0.02 (-0.37)	1.42 (1.03)	0.016 (0.12)	0.31 (0.81)	0.46 (0.84)	1.12 (0.72)	0.053 (0.34)	-0.073 (-0.75)	1.04* (2.21)	-0.26 (-1.02)	0.38
St. Lucia	Dy	0.034 (1.51)	0.78** (1.92)	-0.029 (-0.54)	0.19 (0.95)	0.076 (0.29)	0.28 (0.48)	-0.043 (-0.35)	0.0021 (0.03)	-0.055 (-0.29)	0.50 (1.68)	0.37
	Dp	-0.037 (-1.18)	-0.28 (-0.50)	0.033 (0.44)	0.66* (2.38)	0.066 (0.18)	0.23 (0.29)	0.42* (2.48)	-0.051 (-0.49)	0.49** (1.84)	0.46** (1.84)	0.63
St. Vincent & Grendines	Dy	0.013 (0.65)	-0.23 (-0.60)	0.015 (0.35)	0.29** (1.85)	0.048 (0.36)	0.062 (0.16)	0.0059 (0.12)	-0.033 (-1.19)	0.35* (2.23)	0.20 (1.19)	0.47
	Dp	-0.052* (-2.31)	0.50 (1.10)	0.074 (1.45)	0.53* (2.91)	0.27** (1.75)	-0.21 (-0.49)	0.17* (3.07)	-0.07* (-2.05)	0.49* (2.69)	-0.28 (-1.37)	0.61
Suriname	Dy	0.033 (1.31)	0.062 (0.66)	0.057 (0.41)	-0.14 (-0.90)	-0.20* (-2.10)	0.015 (0.10)	0.17 (0.71)	0.0067 (0.03)	0.083 (0.39)	-0.17 (-0.64)	0.35
	Dp	-0.043 (-0.83)	-0.43* (-2.23)	1.09* (3.74)	0.06 (0.19)	0.18 (0.89)	-0.43 (-1.41)	1.06* (2.18)	0.21 (0.44)	0.12 (0.28)	0.96** (1.76)	0.92
Swaziland	Dy	0.094* (3.43)	-0.20 (-1.53)	-0.04 (-0.63)	0.061 (0.37)	-0.10 (-1.05)	0.44* (2.00)	-0.12 (-1.28)	0.23* (2.10)	0.26 (0.77)	0.032 (0.11)	0.50
	Dp	0.065** (1.85)	-0.02 (-0.12)	0.027 (0.30)	0.37** (1.80)	0.072 (0.55)	-0.26 (-0.92)	0.10 (0.86)	-0.047 (-0.35)	-0.71 (-1.68)	0.66* (1.74)	0.40
Syrian Arab Republic	Dy	-0.042 (-0.66)	-0.028 (-0.33)	0.065 (0.47)	0.073 (0.15)	0.20** (1.73)	-0.37 (-1.64)	0.036 (0.20)	-0.15* (-2.56)	0.94* (2.44)	-0.46 (-1.14)	0.53
	Dp	-0.045 (-0.71)	0.16** (1.88)	0.047 (0.34)	0.64 (1.33)	0.24* (2.14)	-0.025 (-0.11)	0.0094 (0.05)	0.07 (1.17)	0.18 (0.47)	-0.41 (-1.02)	0.50
Tanzania	Dy	0.11 (0.46)	-0.004 (-0.06)	0.02 (0.62)	0.056 (0.35)	0.033 (1.09)	-0.054 (-0.64)	0.35 (0.79)	-0.046 (-0.81)	-0.0053 (-0.06)	0.039 (0.41)	0.17
	Dp	-0.057 (-0.80)	-0.08 (-0.42)	0.68* (7.14)	0.50 (1.08)	0.20* (2.21)	0.23 (0.95)	-0.15 (-1.13)	-0.16 (-0.97)	0.32 (1.23)	0.018 (0.07)	0.84
Thailand	Dy	0.10* (6.63)	-0.47* (-2.48)	-0.046 (-0.53)	-0.20* (-2.55)	-0.47* (-3.08)	0.029 (0.12)	0.09 (0.85)	-0.0081 (-0.50)	0.17 (1.51)	0.069 (0.48)	0.79
	Dp	0.053 (1.68)	0.18 (0.45)	0.35** (1.91)	-0.079 (-0.49)	0.39 (1.24)	0.71 (1.37)	0.10 (0.48)	-0.013 (-0.38)	0.095 (0.40)	0.55** (1.80)	0.34
Togo	Dy	0.015 (0.66)	0.026 (0.24)	0.21 (1.35)	-0.15 (-1.15)	0.023 (0.14)	0.18 (0.95)	0.35* (2.14)	-0.01* (-2.10)	0.031 (0.38)	0.085 (0.85)	0.39
	Dp	0.025 (1.17)	0.25* (2.47)	0.42* (2.90)	-0.20 (-1.58)	0.26** (1.74)	-0.15 (-0.83)	0.25 (1.62)	-0.04 (-0.90)	0.12 (1.57)	0.12 (1.24)	0.64
Tonga	Dy	0.021 (0.83)	0.077 (0.12)	0.016 (0.41)	-0.051 (-0.34)	0.11 (0.46)	0.13 (0.41)	0.064 (0.45)	-0.066 (-0.36)	-0.26 (-0.76)	0.08 (0.43)	0.24
	Dp	0.052** (1.82)	0.74 (0.98)	-0.018 (-0.39)	0.064 (0.37)	0.11 (0.41)	-0.25 (-0.69)	-0.061 (-0.37)	0.18 (0.83)	0.27 (0.69)	0.14 (0.68)	0.46
Trinidad and Tobago	Dy	0.039 (1.36)	-0.39 (-0.83)	0.049 (0.40)	-0.023 (-0.73)	-0.042 (-0.25)	-0.076 (-0.18)	-0.00015 (-0.01)	-0.011 (-0.55)	-0.0072 (-0.03)	0.36* (1.97)	0.29
	Dp	0.037 (0.95)	0.68 (1.05)	-0.051 (-1.16)	0.46* (2.75)	-0.25 (-1.13)	0.62 (1.08)	0.021 (0.52)	-0.0025 (-0.09)	0.015 (0.05)	0.35 (1.40)	0.38
Tunisia	Dy	0.061* (2.42)	-0.26** (-1.78)	-0.049 (-1.33)	0.17 (0.91)	-0.049 (-0.08)	-0.12 (-0.58)	-0.16* (-2.27)	-0.032 (-1.39)	-0.036 (-0.15)	0.28 (1.02)	0.46
	Dp	-0.015 (-0.99)	0.51* (5.58)	-0.027 (-1.22)	0.39* (3.48)	0.043 (0.32)	-0.08 (-0.65)	0.054 (1.23)	-0.017 (-1.17)	0.22 (1.48)	-0.21 (-1.22)	0.70
Turkey	Dy	0.10* (2.75)	0.12 (0.79)	0.0011 (0.05)	-0.29 (-1.35)	-0.079 (-1.38)	-0.13 (-1.29)	0.0093 (0.28)	0.0051 (0.52)	0.19 (1.29)	-0.069 (-0.44)	0.43
	Dp	0.15** (1.71)	1.14* (3.06)	0.018 (0.35)	-0.31 (-0.60)	0.40* (2.96)	0.28 (1.16)	-0.087 (-1.09)	0.010 (0.43)	-0.49 (-1.38)	1.02* (2.73)	0.89

Uganda	Dy	0.078* (2.66)	0.059 (1.39)	-0.12 (-1.68)	-0.016 (0.25)	-0.085 (-1.30)	0.028 (0.36)	0.14 (1.17)	-0.18 (-1.60)	-0.20* (-1.98)	-0.0043 (-0.04)	0.41
	Dp	-0.13 (-1.36)	0.097 (0.71)	0.48* (2.09)	0.46* (2.20)	-0.26 (-1.20)	0.18 (0.72)	0.63 (1.57)	-0.093 (-0.26)	0.62** (1.85)	-0.31 (-0.89)	0.87
United Arab Emirates	Dy	0.057 (1.11)	-0.92 (-0.15)	0.20 (0.83)	-0.76* (-3.00)	2.57 (0.28)	-0.64 (-0.28)	0.55 (0.97)	0.16 (0.34)	0.12 (0.26)	-0.027 (-0.08)	0.53
	Dp	0.08** (1.80)	-8.63** (-1.68)	0.42* (2.02)	0.071 (0.33)	-21.10* (-2.68)	0.0027 (0.001)	-0.79 (-1.61)	0.28 (0.68)	-0.53 (-1.28)	-0.20 (-0.65)	0.70
Uruguay	Dy	0.0021 (0.09)	-0.13* (-2.12)	0.0068 (0.10)	0.13* (2.04)	0.033 (0.47)	-0.25* (-2.26)	0.12** (1.76)	0.037 (0.81)	-0.15 (-1.22)	0.17 (1.35)	0.34
	Dp	-0.06 (-1.49)	0.35* (3.63)	0.19** (1.72)	0.54* (5.27)	0.45* (4.03)	0.29 (1.61)	0.46* (4.04)	0.15* (2.06)	0.43* (2.17)	0.11 (0.54)	0.93
Venezuela, Rep. Bol.	Dy	0.039* (1.98)	-0.25** (-1.73)	0.19 (1.98)	-0.07 (-0.80)	-0.048 (-0.56)	-0.24 (-1.30)	0.10 (0.48)	0.26 (1.18)	-0.08 (-1.17)	0.073 (0.85)	0.37
	Dp	-0.0012 (-0.04)	0.80* (3.47)	0.24 (1.58)	0.17 (1.23)	0.31* (2.21)	0.87* (2.98)	0.41 (1.20)	0.20 (0.57)	0.11 (1.04)	-0.026 (-0.19)	0.91
Yemen, Republic of	Dy	0.068* (2.35)	0.007 (0.14)	0.095 (1.17)	-0.08 (-0.70)	-0.043 (-0.58)	0.20 (1.64)	0.078 (0.50)	0.015 (0.38)	0.010 (0.07)	0.055 (0.26)	0.19
	Dp	0.074 (1.63)	0.22* (2.73)	-0.048 (-0.27)	0.57* (4.52)	0.13 (1.16)	0.098 (0.50)	0.21 (0.85)	0.12** (1.89)	-0.46** (-1.94)	0.83* (2.47)	0.67
Zambia	Dy	0.072* (2.04)	0.07 (0.39)	-0.085 (-0.58)	-0.026 (-0.17)	-0.039 (-0.34)	0.0035 (0.02)	-0.18 (-1.44)	0.21 (1.11)	0.011 (0.07)	0.099 (0.41)	0.23
	Dp	0.038 (1.04)	0.70* (3.69)	-0.22 (-1.45)	0.55* (3.45)	0.63* (5.20)	0.20 (0.95)	-0.35* (-2.72)	0.47* (2.35)	0.093 (0.56)	0.023 (0.09)	0.95
Zimbabwe	Dy	0.072* (2.86)	-0.08 (-0.86)	0.15 (1.06)	-0.18** (-1.91)	0.037 (0.17)	0.31 (1.40)	-0.19** (-1.91)	0.023 (0.60)	0.12 (0.71)	0.21 (0.83)	0.39
	Dp	0.034 (1.29)	0.57* (5.89)	-0.036 (-0.36)	0.43* (2.97)	0.16 (0.71)	0.90* (3.91)	0.14 (1.32)	0.04 (1.01)	-0.043 (-0.25)	0.48** (1.79)	0.86

Empirical models: $Dy_t = \alpha_0 + \alpha_1 EDI_t + \alpha_2 EDG_t + \alpha_3 EDM_t + \alpha_4 negI_t + \alpha_5 posI_t + \alpha_6 negG_t + \alpha_7 posG_t + \alpha_8 negM_t + \alpha_9 posM_t + \eta_{yt}$
 $Dp_t = \beta_0 + \beta_1 EDI_t + \beta_2 EDG_t + \beta_3 EDM_t + \beta_4 posI_t + \beta_5 negI_t + \beta_6 posG_t + \beta_7 negG_t + \beta_8 posM_t + \beta_9 negM_t + \eta_{pt}$
t-ratios are in parentheses. * and ** denote statistical significance at the five and ten percent levels.

5. Cross-country analysis

The time-series evidence indicates a wide variation in the effects of monetary shocks on output growth and price inflation across developing countries. In light of this evidence, two questions are worthy of further investigation: (i) what are the major factors that might explain the difference in the effects of monetary shocks across countries?, and (ii) what are the implications of the observed differences to economic performance across countries?

5.1. Determinants of the difference in the effects of monetary shocks

A number of structural parameters, on the demand or supply sides of the economy, may underlie observed differences in the effects of monetary shocks across countries. Given data limitation, cross-country analysis will account for a number of specific factors. The real effects of monetary shocks are likely to vary with price flexibility, demand elasticity, and policy variability. Two cross-country regressions are estimated.¹⁴ In the first regression, the real effects of monetary shocks, β_{yp} and β_{yn} vary with the inflationary effects of monetary shocks, β_{5pp} or β_{5pn} in model (4), the elasticity of aggregate demand in the face of monetary shocks, γ_{2p} or γ_{2n} in model (2), and the variability of monetary shocks, σ_{ms} . The second regression incorporates price flexibility along the short-run supply curve, α_{3p} or α_{3n} in model (1), the size of demand shifts, and monetary variability.¹⁵

In regression (1) of Table 2, the response of output growth to expansionary monetary shocks decreases significantly with the flexibility of price inflation in the face of monetary shocks, β_{5pp} . This indicates a strong trade-off between the real and inflationary effects of monetary shocks, reflecting supply-side constraints that necessitate higher inflation in the face of capacity limitations. The real effect of monetary shocks increases significantly with the size of demand expansion, implying more effectiveness the stronger the transmission mechanism of monetary policy to aggregate demand. The variability of

¹⁴ Estimates from the time-series models are employed in the cross-section regressions, having been weighted by the inverse of the standard error. That is, parameters that are more variable are weighted less heavily in the cross-section model.

¹⁵ Higher monetary variability increases uncertainty, which may decrease credibility and counter the effectiveness of monetary policy. 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 & Kandil, 1991) suggests that wages are more flexible in response to demand shifts the higher 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, & Romer, 1988) advocates that prices are more flexible the higher uncertainty about demand shifts. More flexible prices are consistent with a steeper aggregate supply curve.

Table 2
Determinants of the real effects of expansionary and contractionary monetary shocks across countries.

Regression	Dependent variable	Constant	Price flexibility	Demand elasticity	Variability σ_{ms}	R squared
(1)	Expansionary effect of monetary shocks = β_{5yp}	-0.064* (-2.15)	β_{5pp} -0.59* (-7.86)	γ_{2p} 0.78* (7.45)	0.015 (0.24)	0.40
(2)	Expansionary effect of monetary shocks = β_{5yp}	0.085 (1.09)	α_{3p} -0.17* (-1.99)	γ_{2p} 0.30* (2.91)	0.016 (0.21)	0.091
(3)	Contractionary effect of monetary shocks = β_{5yn}	-0.012 (-0.41)	β_{5pn} -0.64* (-9.56)	γ_{2n} 0.85* (11.31)	0.0042 (0.07)	0.58
(4)	Contractionary effect of monetary shocks = β_{5yn}	-0.038 (-0.47)	α_{3n} -0.029 (-0.33)	γ_{2n} 0.53* (5.82)	0.012 (0.15)	0.23

β_{5yp} , β_{5yn} are the parameters measuring the response of real output growth to expansionary and contractionary shocks in the empirical model (3).

β_{5pp} , β_{5pn} are the parameters measuring the response of price inflation to expansionary and contractionary shocks in the empirical model (4).

α_{3p} , α_{3n} are the parameters measuring the response of price inflation to expansionary and contractionary shocks in the empirical model (1).

λ_{2p} , γ_{2n} are the parameters measuring the response of aggregate demand shocks to expansionary and contractionary shocks in the empirical model (2).

σ_{ms} is the standard deviation of shocks to the growth of the money supply.

t-ratios are in parentheses. * denotes statistical significance at the five percent level.

monetary shocks does not differentiate, however, output expansion across countries, ruling out the effect of uncertainty on monetary policy effectiveness.

The second regression in Table 2 isolates the effects of supply-side and demand-side determinants. Output expansion decreases significantly the steeper the aggregate supply curve across countries, providing further evidence regarding the role of capacity constraints in hindering output adjustment and escalating price inflation. This is evident by the negative and significant response to the parameter measuring upward price flexibility along the aggregate supply curve, α_{3p} . In addition, output expansion increases significantly with the elasticity of aggregate demand in the face of expansionary monetary shocks, reinforcing the importance of demand elasticity to the effectiveness of monetary policy.

The evidence appears robust for the real effects of contractionary monetary shocks across countries. In regression (3) of Table 2, output fluctuations in the face of monetary shocks, β_{5pn} , varies negatively and significantly with downward price flexibility. The implication is output contraction is more moderate the greater the price adjustment with respect to contractionary shocks and vice versa. Furthermore, output contraction increases significantly the larger the elasticity of aggregate demand in the face of monetary shocks, reinforcing the role of elastic demand to the transmission mechanism of monetary policy.

In the last regression of Table 2, supply-side constraints appear less binding in the face of negative monetary shocks. The effect of downward price flexibility along the aggregate supply curve, α_{3n} , is negative but not significant.¹⁶ In contrast, output contraction increases with the elasticity of aggregate demand in the face of negative monetary shocks, implying

larger contraction the bigger the demand contraction with respect to a reduction in liquidity. This is evident by the positive and significant parameter in regression (4) of Table 2.

5.2. Monetary shocks and economic performance

The analysis of this section evaluates variation in the trend and variability of output growth and price inflation with the effects of monetary shocks across countries.

5.2.1. Variation in trend output growth with monetary shocks

Trend real output growth is measured by the time-series average of the first-difference of the log value of real output, $\overline{\Delta y}$. Table 3 presents the evidence of variation in trend real output growth with the effects of monetary shocks across countries.

The first regression evaluates variation in trend real output growth with output expansion, β_{5yp} , demand expansion, γ_{2p} , and the variability of monetary shocks, σ_{ms} , across countries. Trend output growth increases significantly with the expansionary effect of monetary policy shocks, implying an important role for monetary policy to revive growth by availing liquidity for capacity building.

The second regression in Table 3 evaluates variation in trend real output growth with output contraction, β_{5yn} , demand contraction, γ_{2n} , and the variability of monetary shocks, σ_{ms} . None of the parameters is statistically significant in this regression, ruling out the relevance of monetary contraction to differences in trend growth across countries.

Regression (3) evaluates the effects of both expansionary and contractionary monetary shocks on trend real output growth. In addition, the cross-country regression accounts for demand shifts in the face of demand expansion and contraction and for the variability of monetary shocks. Trend output growth increases significantly with the expansionary effect of monetary shocks, β_{5yp} . Trend output growth increases despite the effects of monetary contraction, as evident by the positive and statistically significant response to β_{5yn} across countries. The results indicate that monetary policy plays a vital role in

¹⁶ This is consistent with a more binding capacity constraint in the face of monetary expansion. That is, the aggregate supply curve is generally steeper in the face of expansionary aggregate demand shifts. To formalize this evidence, the difference between upward and downward price flexibility in the empirical model (1) is positive and statistically significant in fifty six countries.

Table 3
The effects of fluctuations in monetary shocks on trend real output growth across countries.

Regression	Dependent variable	Constant	β_{5yp}	β_{5yn}	γ_{2p}	γ_{2n}	σ_{ms}	R squared
<i>Average real output growth</i>								
(1)	\overline{Dy}	0.038* (22.38)	0.01* (2.40)		-0.003 (-0.63)		-0.0024 (-0.66)	0.053
(2)	\overline{Dy}	0.037* (20.37)		0.0063 (1.43)		0.0041 (0.85)	-0.002 (-0.53)	0.047
(3)	\overline{Dy}	0.038* (18.02)	0.015* (3.06)	0.012* (2.64)	-0.004 (-0.83)	-0.002 (-0.39)	-0.0023 (-0.63)	0.12

\overline{Dy} denotes the time-series average of real output growth.

β_{5yp} , β_{5yn} are the parameters measuring the response of real output growth to expansionary and contractionary shocks in the empirical model (3).

γ_{2p} , γ_{2n} are the parameters measuring the response of aggregate demand shocks to expansionary and contractionary shocks in the empirical model (2).

σ_{ms} is the standard deviation of shocks to the growth of the money supply.

t-ratios are in parentheses. * denotes statistical significance at the five percent level.

determining trend real output growth and that the evidence is asymmetric. That is, capacity building is highly dependent on available liquidity and appears to be robust to cyclical dry up in liquidity during monetary contraction.

Table 4 presents the evidence regarding variation in trend price inflation across countries. In regression one, trend price inflation is regressed on the inflationary effect of expansionary monetary policy, β_{5pp} , demand expansion, γ_{2p} , as well as on the variability of monetary shocks, σ_{ms} . Judged by statistical significance, the variability of monetary shocks increases trend price inflation significantly. The evidence remains robust in regression (2), which accounts for the deflationary effect of monetary policy, β_{5pn} , and the size of demand contraction, γ_{2n} . Higher monetary variability increases uncertainty and increases the speed of price adjustment, escalating trend price inflation.

Regression (3) combines the inflationary and deflationary effects of monetary shocks. A larger response of price inflation to contractionary demand shocks has a positive and significant

effect on trend price inflation across countries. Trend price inflation appears to be increasing despite the deflationary effects of monetary shocks, ruling out the importance of cyclical monetary contraction in deviating trend inflation from its steady-state path. Further, the variability of monetary shocks increases trend price inflation significantly across countries. Higher monetary variability increases inflationary expectation, which contributes to a higher trend inflation across countries.

5.2.2. The destabilizing effects of monetary variability

In Table 5, the dependent variable (the standard deviation of real output growth) is regressed on the output response to monetary shocks, β_{5yp} and/or β_{5yn} , the size of demand shifts, γ_{2p} and/or γ_{2n} , and the variability of monetary shocks, σ_{ms} , across countries.

In regression (1), output variability decreases significantly with the effect of expansionary monetary shocks on real growth. In regression (3), the variability of output growth decreases significantly with the effects of expansionary and

Table 4
The effects of fluctuations in monetary shocks on trend price inflation across countries.

Regression	Dependent variable	Constant	β_{5pp}	β_{5pn}	γ_{2p}	γ_{2n}	σ_{ms}	R squared
<i>Average price inflation</i>								
(1)	\overline{Dp}	0.097* (6.72)	0.019 (0.52)		0.019 (0.37)		0.24* (7.72)	0.35
(2)	\overline{Dp}	0.10* (6.76)		0.056 (1.59)		-0.045 (-1.14)	0.24* (7.33)	0.36
(3)	\overline{Dp}	0.091* (5.10)	0.05 (1.28)	0.081* (2.10)	0.0046 (0.09)	-0.048 (-1.22)	0.24* (7.79)	0.38

\overline{Dp} denotes the time-series average of price inflation.

β_{5pp} , β_{5pn} are the parameters measuring the response of price inflation to expansionary and contractionary shocks in the empirical model (4).

γ_{2p} , γ_{2n} are the parameters measuring the response of aggregate demand shocks to expansionary and contractionary shocks in the empirical model (2).

σ_{ms} is the standard deviation of shocks to the growth of the money supply.

t-ratios are in parentheses. * denotes statistical significance at the five percent level.

Table 5
The effects of fluctuations in monetary shocks on the variability of real output growth across countries.

Regression	Dependent variable	Constant	β_{5yp}	β_{5yn}	γ_{2p}	γ_{2n}	σ_{ms}	R squared
<i>Variability of real output growth</i>								
(1)	σ_y	0.051* (15.94)	-0.029* (-3.56)		0.0021 (0.23)		0.0010 (0.15)	0.11
(2)	σ_y	0.055* (15.89)		-0.0019 (-0.22)		-0.014 (-1.52)	0.00027 (0.04)	0.031
(3)	σ_y	0.052* (12.90)	-0.034* (-3.69)	-0.016** (-1.77)	0.0026 (0.28)	-0.00061 (-0.06)	0.00057 (0.08)	0.14

σ_y denotes the standard deviation of real output growth.

β_{5yp} , β_{5yn} are the parameters measuring the response of real output growth to expansionary and contractionary shocks in the empirical model (3).

β_{5pp} , β_{5pn} are the parameters measuring the response of price inflation to expansionary and contractionary shocks in the empirical model (4).

γ_{2p} , γ_{2n} are the parameters measuring the response of aggregate demand shocks to expansionary and contractionary shocks in the empirical model (2).

σ_{ms} is the standard deviation of shocks to the growth of the money supply.

t-ratios are in parentheses. * denotes statistical significance at the five percent level.

Table 6
The effects of fluctuations in monetary shocks on the variability of price inflation across countries.

Regression	Dependent variable	Constant	β_{5pp}	β_{5pn}	γ_{2p}	γ_{2n}	σ_{ms}	R squared
	<i>Variability of price inflation</i>							
(1)	σ_p	0.12* (4.85)	0.049 (0.81)		−0.002 (−0.02)		0.34* (6.45)	0.28
(2)	σ_p	0.13* (4.96)		0.11** (1.80)		−0.096 (−1.47)	0.33* (6.48)	0.29
(3)	σ_p	0.11* (3.68)	0.11 (1.65)	0.15* (2.40)	−0.03 (−0.36)	−0.11 (−1.60)	0.34* (6.53)	0.32

σ_p denotes the standard deviation of price inflation.

β_{5pp} , β_{5pn} are the parameters measuring the response of price inflation to expansionary and contractionary shocks in the empirical model (4).

γ_{2p} , γ_{2n} are the parameters measuring the response of aggregate demand shocks to expansionary and contractionary shocks in the empirical model (2).

σ_{ms} is the standard deviation of shocks to the growth of the money supply.

t-ratios are in parentheses. * denotes statistical significance at the five percent level.

contractionary monetary shocks on real growth. Output fluctuations in the face of both positive and negative monetary shocks are stabilizing, decreasing the variability of real output growth across countries.

The evidence in Table 6 appears in sharp contrast. The variability of price inflation varies positively and significantly with the inflationary effects of monetary shocks. Monetary shocks increase the trend and variability of price inflation across countries. Consistently, the variability of monetary shocks has a positive and statistically significant effect on the variability of price inflation across countries.

6. Summary and conclusion

Monetary policy is an important policy instrument to achieve targeted results. The analysis of monetary policy is complicated, however, by confusion over the objectives of monetary policy. Announced objectives may vary based on established priorities. In a small open economy, monetary policy may be targeting a fixed exchange rate. Concerns, however, may arise about inflation which may warrant an inflation targeting strategy. Alternatively, the priorities of monetary policy may aim at stabilizing real output growth.

In developing countries, the analysis of monetary policy has been hampered by the lack of a clear announcement of the direction of monetary policy. The common perception is that central banks in many developing countries are obligated to finance the growing deficits in government finances. A thorough investigation of the role of monetary policy in developing countries has not been carried out before. Based on data availability, empirical time-series models are estimated for a sample of 105 countries. The estimation illustrates the allocation of monetary growth shocks between output growth and price inflation.

There are two channels that underlie the interaction between monetary growth shocks and the aggregate economy: an aggregate demand channel and an aggregate supply channel. On the demand side, the elasticity of aggregate demand with respect to the underlying monetary shock captures a composite of structural parameters that govern the transmission mechanism of monetary policy and determine the response of various spending components to monetary growth. On the supply side, constraints in the labor and output markets determine flexibility to adjust the output produced.

Cross country regressions analyze important factors that differentiate the allocation of monetary growth shocks between output growth and price inflation. Three factors are under consideration: price flexibility, demand elasticity, and monetary uncertainty. The more binding supply-side constraints, the more flexible are prices and the smaller is the response of output growth to monetary shocks. Capacity constraints appear to be particularly binding, limiting output adjustment in the face of expansionary monetary shocks. Output fluctuations are also exacerbated with the size of demand shifts that vary with demand elasticities in the face of monetary shocks. The variability of monetary shocks does not differentiate the size of output fluctuations across countries, ruling out the relevance of aggregate uncertainty to output adjustment.

Next, the investigation evaluates the effects of monetary shocks on economic performance across countries. Expansionary monetary shocks increase trend output growth across countries, establishing the importance of monetary growth to capacity building. Additionally, monetary policy shocks are stabilizing, reducing the variability of output growth as monetary growth mitigates fluctuations away from steady-state trends. Fluctuations in monetary growth increase the trend and variability of price inflation across countries, indicating more flexibility of prices to absorb the monetary shock.

Monetary policy is an important instrument of economic development. To maximize the effects of monetary policy, a number of structural constraints needs to be addressed. On the demand side, monetary policy should aim at maximizing the positive effect of credit availability on private spending by addressing structural bottlenecks that block the transmission mechanism and interfere with demand elasticity. This requires refraining from heavy reliance on monetary policy to finance government spending, increasing inflationary expectations and crowding out private activity. Policy credibility is also important to curb inflationary expectations that could trigger a cycle of capital outflows and reduce inflows. The success of monetary policy in controlling inflationary expectation is necessary to stabilize the exchange rate, safeguard competitiveness, and anchor inflationary expectations toward achieving macroeconomic stability. On the supply side, failure to stimulate output growth in the face of monetary fluctuations should signal concerns about capacity constraints that hinder output adjustment, increasing inflationary pressures. In light of these

constraints, the objectives of monetary policy should be geared explicitly toward inflation targeting to stabilize inflationary expectations and increase incentives for growth-inductive private activity.

Appendix A. Econometric methodology

The surprise terms that enter models (1) through (4) are unobservable, necessitating the construction of empirical proxies before estimation can take place. Thus, the empirical models include equations that describe the process generating the change in aggregate demand, government spending, the money supply, and the exchange rate. The predictive values of these equations are the proxies for agents' expectations of the change in these variables.

Obtaining the proxy for agents' forecasts follows the results of the endogeneity test suggested by Engle (1982). Given evidence of endogeneity, variables in the forecast equations are based on the results of a formal causality test. Hence, agents' forecasts are approximated using two lags of the change in the short-term interest rate and two lags of the change in the log-value of real output, the price level, government spending, the money supply, the exchange rate and the energy price. Structural break dummies are introduced, as warranted, to account for different policy regimes. As outlined in Borys, Horvath, and Fanta (2009), it is difficult to estimate monetary shocks accurately across different monetary regimes without appropriately controlling for regime shifts using structural break dummies.

Surprises that enter the empirical models are then formed by subtracting agents' forecasts from the actual growth in each variable. The positive and negative components of shocks are defined for joint estimation, following the suggestions of Cover (1992), as follows:

$$\begin{aligned} negs_t &= -\frac{1}{2} \{abs(Dss_t) - Dss_t\} \\ poss_t &= \frac{1}{2} \{abs(Dss_t) + Dss_t\} \quad s = d, g, m, h \end{aligned}$$

where Dds_t , Dgs_t , Dms_t , and Dhs_t are the shocks to the change in aggregate demand, government spending, the money supply, and the exchange rate. The terms $negs_t$ and $poss_t$ are the negative and positive components of each shock.

In order to obtain efficient estimates and to ensure correct inferences (i.e., to obtain consistent variance estimates), the empirical models in (1) and (2) or (3) and (4) are estimated jointly with the equations that determine proxy variables following the suggestions in Pagan (1984, 1986) using 3SLS. The instruments list for estimation includes two lags of the change in the interest rate and two lags of the change in the log value of real output, the price level, government spending, the money supply, the exchange rate, and the energy price. The paper's evidence is robust with respect to variations in the instruments list or the lag length.

The results of Engle's (1982) test for serial correlation in simultaneous-equation models are consistent with the presence

of a first-order autoregressive errors in some models. To correct for serial correlation, it is assumed that the error term follows an AR(1) process. To filter out serial correlation, the estimated model is transformed through the filter $(1 - \rho L)$ where ρ is the estimate of the serial correlation parameter and L is the lag operator such that $LX_t = X_{t-1}$. The estimated residuals from the transformed models have zero mean and are serially independent.

Appendix B. Data sources

1. Real Output: Gross domestic product, constant prices, $W914NGDP_R$, WEO.
2. Aggregate Demand: Gross domestic product, current prices, $W914NGDP$, WEO.
3. Price: Gross domestic product deflator, $W914NGDP_D$, WEO.
4. Government Spending: Public consumption expenditure, current prices, $W914NCG$, WEO, or government consumption, $61291F.ZF...$, IFTSTSUB.
5. Exchange Rate: National currency per U.S. dollar, $W914ENDA$, WEO.
6. Monetary Base: Reserve money, $W914FMB$, WEO.
7. Consumption: Private consumption expenditure, current prices, $W311NFIP$, WEO.
8. Investment: Gross private fixed capital formation, current prices, $W311NFIP$, WEO.
9. Imports: Imports of goods and services, current prices, $W213NM$, WEO.
10. Exports: Exports of goods and services, current prices, $W513NX$, WEO.
11. Money: the sum of currency outside banks and private sector demand deposits, $91434...ZF...$, IFTSTSUB.
12. Interest Rate: representatives of short-term interest rate. Deposit rate, $21360L.ZF...$, IFTSTSUB. Lending rate, $21360P.ZF...$, IFTSTSUB.
13. The Energy Price: West Texas Intermediate Price.

All annual series are from *World Economic Outlook* or *International Financial Statistics*, available on tape from the International Monetary Fund.

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