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# Effects of fiscal deficit and money M2 supply on inflation: Evidence from selected economies of Asia



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## ABSTRACT

A sustained high growth rate of gross domestic product at a low inflation is one of the main goals of the majority of macroeconomic policies, so keeping the price stability plays an important role in determining the growth rate of output. This paper empirically investigates effects of fiscal deficit and broad money M2 supply on inflation in Asian countries, namely Bangladesh, Cambodia, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam in the period of 1985–2012. By applying the Pooled Mean Group (PMG) estimation-based error correction model and the panel differenced GMM (General Method of Moment) Arellano-Bond estimator, the study finds out broad money M2 supply has significantly positive impact on inflation only in the method of PMG estimation whereas fiscal deficit, government expenditure and interest rate are the statistically significant determinants of inflation in both methods of estimation

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## Efectos del déficit fiscal y el suministro de dinero M2: evidencia de las economías asiáticas seleccionadas

### RESUMEN

El sostenimiento de una elevada tasa de crecimiento del producto bruto interno a baja inflación es uno de los principales objetivos de la mayoría de las políticas macroeconómicas, por lo que el mantenimiento de la estabilidad de los precios juega un papel relevante en la determinación del índice de crecimiento del *output*. Este documento investiga empíricamente los efectos del déficit fiscal y el suministro amplio de dinero M2 sobre la inflación en los países asiáticos, en concreto Bangladesh, Camboya, Indonesia, Malasia, Paquistán, Filipinas, Sri Lanka, Tailandia, y Vietnam durante el periodo comprendido entre 1985 y 2012. Aplicando el modelo de corrección basado en la estimación de Pooled Mean Group (PMG) y el estimador Arellano-Bond del Método Generalizado de Momentos (MGM) del panel diferenciado, el estudio llega a la conclusión de que el amplio suministro de dinero M2 tiene un impacto considerablemente positivo sobre la inflación utilizando únicamente el método de la estimación de PMG, mientras que el déficit fiscal, el gasto gubernamental y los tipos de interés constituyen determinantes estadísticamente significativos de la inflación en ambos métodos de cálculo.

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## 1. Introduction

A major objective of macroeconomic policies is to foster economic growth and to keep inflation on a low level. The stability of price is one of the factors in determining the growth rate of

an economy; hence, the monetary authorities of many countries implement monetary policies to maintain inflation at a desirable rate. A very high inflation affects the economy drastically, but there is some evidence that moderate inflation also slows down growth (Temple, 2000). However, the high level of inflation stems from not only instruments of monetary policy (money supply, interest rate, etc.) but also the effects of fiscal policy (fiscal deficit, government expenditure, etc.). Indeed, Fischer, Sahay, & Végh (2002) showed that fiscal deficit is one of main drivers of high inflation.

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Most of selected Asian countries have high relatively levels of fiscal deficit and money supply as governments increase spending to foster economic growth and create employment. According to [Asian Development Bank \(2013\)](#), the average shares of budget deficit and broad money M2 supply to GDP in 2012 in these countries is -3.9% and 71.6% respectively in which the highest ratios of fiscal deficit belong to Pakistan (-6.64%), Sri Lanka (-6.4%) and Bangladesh (-4.56%) while that of broad money M2 supply occur at Malaysia (142%), Thailand (124.8%) and Vietnam (108.4%). By new econometric techniques, the study will define significant determinants of inflation in order to suggest some recommendations about macroeconomic policies related to inflation.

The purpose of this paper is to apply the PMG-based error correction model and the panel differenced GMM Arellano-Bond estimation to investigate effects of fiscal deficit and broad money M2 supply on inflation in Asian countries, namely Bangladesh, Cambodia, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam in the period of 1985–2012.

The remainder of this paper will be proceed as follows: Section 2 outlines a review of literature about effects of fiscal deficit and money supply on inflation; Section 3 describes the methodology and data; Section 4 presents results and discussion, and the final section is the conclusion and policy implications.

## 2. Literature review

### 2.1. The effect of fiscal deficit on inflation

Several studies have exploited both the time and cross-sectional dimensions of data (panel data) to examine the relationship between fiscal deficits and inflation. [Karras \(1994\)](#) investigates the effects of budget deficits on money growth, inflation, investment and real output growth using annual data from a sample of 32 countries in the period of 1950-1989 and finds that deficits are not inflationary. However, [Cottarelli et al. \(1998\)](#) find a significant impact of fiscal deficits on inflation in industrial and transition economies by using the dynamic panel data model in 47 countries from 1993 to 1996.

[Fischer et al. \(2002\)](#), using the data set of 94 developing and developed countries from 1960 to 1995, find that the relationship between fiscal deficits and inflation is only strong in high-inflation countries during high-inflation episodes, and weak in low-inflation countries and in high-inflation countries during low-inflation episodes.

[Catão and Terrones \(2005\)](#) apply the pooled mean group estimation method to a data set spanning 107 countries over the 1960-2001 period. It is shown that, empirically, deficits have an impact on inflation and such an impact is stronger in high-inflation or developing countries. As mentioned by [Catão and Terrones \(2005\)](#), developing countries with less efficient tax collection, political instability, and limited access to external borrowing tend to have a lower relative cost of seigniorage and thus a higher inflation tax.

[Lin and Chu \(2013\)](#) applies the dynamic panel quartile regression (DPQR) model under the autoregressive distributional lag (ARDL) specification, and examines the deficit-inflation relationship in 91 countries from 1960 to 2006. The DPQR model estimates the impact of deficits on inflation at various inflation levels and allows for a dynamic adjustment with the ARDL specification. The empirical results note that the fiscal deficit has a strong impact on inflation in high-inflation episodes, and has a weak impact in low-inflation episodes.

[Jayaraman and Chen \(2013\)](#) investigates the relationship between budget deficits and inflation in the four Pacific Island countries (PICs) by undertaking an empirical study of relationship between budget deficits in the four PICs through a panel econometric analysis. A multivariate framework is adopted with

a view to avoiding bias arising out of omission of relevant variables and the methodology employed for estimating a long-run relationship between budget deficits and inflation is the Westerlund error correction based panel co-integration test procedure. The study's findings confirm the existence of a strong, direct relationship between budget deficits and inflation in all four PICs.

### 2.2. Effect of money supply on inflation

Most of empirical studies confirm a strong impact of money supply on inflation. [McCandless & Weber \(1995\)](#) examine data for 110 countries over a 30-year period. The study shows that there is a high (almost unity) correlation between the rate of growth of the money supply and the rate of inflation in long term. With regard to the relationship between money and prices, [King \(2002\)](#) shows that the strong correlation between them disappears as the time horizon shortens indicating that the effects of money growth should emerge in the changes in real variables. According to [Walsh \(2003\)](#), the high correlation between inflation and the growth rate of money supply supports the quantity-theoretic argument that the growth of money supply leads to an equal rise in the price level.

[Nassar \(2005\)](#) uses a two-sector model to estimate the relationship between prices, money, and the exchange rate for quarterly data in Madagascar in the period of 1982-2004. The results show that the money supply has significantly positive impact on inflation.

[Oomes and Ohnsorge \(2005\)](#) investigates the impact of money demand on inflation for monthly data in Russia from April 1996 to January 2004 by using the error correction model. The results confirm that an excess supply of effective broad money is inflationary while other excess money measures are not and that effective broad money growth has the strongest and most persistent effect on short-run inflation.

[Pelipas \(2006\)](#) empirically investigates the money demand and inflation Belarus on the basis of the quarterly data for 1992-2003. Using co-integrated VAR and equilibrium correction model, the study notes the money supply is significantly positive correlated with inflation.

[Hossain \(2010\)](#) investigates the behavior of broad money demand in Bangladesh using annual data over the period of 1973-2008 by using the Johansen co-integration test and the error correction model. Empirical results suggest the existence of a causal relationship between money supply growth and inflation.

## 3. Methodology and data

### 3.1. Methodology

[Pesaran et al. \(1997; 1999\)](#) proposed the PMG estimator that allows the short-term parameters to be heterogeneous between groups while imposing homogeneity of the long-term coefficients between countries. It is one advantage of PMG estimator. Furthermore, the PMG estimator highlights the adjustment dynamic between the short-run and the long-run. The heterogeneity of short-run slope coefficients allows the dynamic specification to differ across countries. However, the drawback of PMG estimator is that it cannot deal with the endogeneity of variables in the model.

The PMG estimation-based error correction model requires an existence of co-integration between dependent variable and explanatory variables. So, the study first tests the stationarity of the variables by using the Fisher tests, developed by [Maddala and Wu \(1999\)](#) and then applies the co-integration test of [Westerlund \(2007\)](#).

The dynamic panel GMM estimation uses the appropriate lags of the instrumented variables to generate internal instruments and employs the pooled dimension of the panel data. So it does not

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