Research Article

Risk Management at the Macroeconomy Level and Development in Developing Countries

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Received 29 March 2014; Revised 6 May 2014; Accepted 7 May 2014; Published 19 May 2014

Academic Editor: Udo Broll

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This paper examines the impact of risk management at the macroeconomy level on economic development in developing countries. Based on data from the World Bank, we use a sample of sixty-three developing economies and find that selected indicators related to risk management at the macroeconomy level do have a statistically significant effect on economic development in these countries. We observe that high inflation rates do not seem to statistically affect economic development even though the coefficient estimate of this variable does have the anticipated negative sign. Regression results show that almost sixty percent of cross-developing country variations in purchasing power parity per capita gross national income can be explained by its linear dependency on the share of international reserves in the GDP and the Worldwide Governance Indicators average. Statistical results of such empirical examination will assist governments in developing countries identify risk management strategies at the macroeconomy level that may be used as powerful instruments for economic development.

1. Introduction

According to the 2014 World Development Report [1], Risk and Opportunity: Managing Risk for Development, macroeconomic preparation has protected the economies of countries as diverse as the Czech Republic, Kenya, and Peru from the adverse effects of the recent global financial crisis. Smaller fiscal deficits and disciplined monetary policy as well as smaller current account deficits enabled these countries to experience a smaller decrease in growth rates following the 2008 international crisis compared to that in the aftermath of the 1997 East Asian crisis. Didier et al. [2] observe the same beneficial effect of macroeconomic preparation in many other low- and middle-income countries. Moderate inflation and sustainable public deficits speed up economic growth while at the same time lowering volatility in the face of external and domestic shocks (see, for instance, Bruno and Easterly [3]).

Since the macroeconomy is the platform where all economic activity occurs, sound macroeconomic management can bring about an environment where households, communities, and enterprises are able to plan for the long haul and undertake their own risk management. In addition, macroeconomic policy can handle large systemic risks, which households and other socioeconomic systems are incapable of addressing on their own. Barro [4] has pointed out that the world economy for decades has been marked by macroeconomic crises which have imposed large welfare losses, more perceptively so since 2007. As a result, policymakers play an important role in preventing these crises or at least in alleviating their effects.

It is normal for modern economies to experience business fluctuations and some level of volatility in the general price level, output, and employment. Evidence shows that high inflation and sudden changes in economic activity produce harmful effects such as a reduction in employment, a credit interruption, and an investment deferment, leading to output losses and a decline in long-term economic growth (see, e.g., Hnatkovska and Loyaza [5]).

The current study empirically examines the effect of selected indicators related to risk management at the macroeconomy level on economic development. Based on data from the World Bank, we use a sample of sixty-three (the sample consists of the following countries: Albania, Algeria,
Armenia, Belarus, Benin, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Chile, Colombia, Republic of Congo, Costa Rica, Croatia, Czech Republic, Dominican Republic, Egypt, Greece, Guatemala, Guinea, Honduras, Hungary, India, Israel, Jordan, Kazakhstan, Kenya, Liberia, Lithuania, Malaysia, Mali, Mauritania, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Slovak Republic, South Africa, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, and Yemen Republic) developing economies and find that selected indicators related to risk management at the macroeconomy level do have a statistically significant effect on economic development in these countries. Regression results show that sixty percent of cross-developing country variations in purchasing power parity per capita gross national income can be explained by its linear dependency on the consumer price index (CPI) inflation rate, the percentage of international reserves in the GDP, and the Worldwide Governance Indicators average. Statistical results of such empirical examination will assist governments in developing countries identify risk management strategies at the macroeconomy level that may be used as powerful instruments for economic development.

This paper is organized as follows. In the next section, a statistical model to be estimated is formulated. Theoretical underpinnings for the inclusion of explanatory variables are presented in this section. Statistical results are reported in the subsequent section. A final section gives concluding remarks as well as policy recommendations.

2. The Statistical Model

If we assume that various indicators related to risk management at the macroeconomy level linearly affect the level of per capita GDP in a developing country, we can state the following statistical model:

\[
\text{PPP GNI} = \beta_0 + \beta_1 \text{CPIInfRat} + \beta_2 \text{InterReserves} + \beta_3 \text{GovnceInd} + \beta_4 \text{ExchgClass} + \varepsilon
\]

where PPP GNI = purchasing power parity GNI per capita, in dollars in 2012.

CPIInfRat = dummy variable which takes on the value of 1 if the consumer price index (CPI) inflation rate, annual average 2010–12 (this is the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services, which may be fixed or changed at specified intervals; the Laspeyres formula is generally used) is above 3 percent and 0 otherwise.

InterReserves = percentage of international reserves in the GDP, annual average, 2010–12 (these are holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities; the gold component of these reserves is valued at year end (December 31) London prices.).

GovnceInd = Worldwide Governance Indicators average, on a scale of −2.5 (least) to 2.5 (most), in 2011 (this is the average of six indicators reflecting broad dimensions of governance (voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; control of corruption) as defined by the Worldwide Governance Indicators project).

ExchgClass = coarse classification of flexible exchange rate regimes, on a scale of 1 (least flexible) to 6 (most flexible), 2006–10 (for each country, five year averages of observed exchange rate flexibility (1996–2000, 2001–05, 2006–10) are computed based on a taxonomy of de facto exchange rate arrangements; the coarse classification of exchange rate regimes takes values between 1 and 6, ranging from the least to most flexible exchange rate regimes).

GrossPubDbt = gross public debt as a percent of GDP, annual average, 2010–12 (gross public debt is all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future; gross public debt includes debt liabilities in the form of special drawing rights, currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes, and other accounts payable).

GovtSurp = government primary surplus as a percentage of GDP, 2010–12 annual average (The government primary surplus is the gross fiscal balance plus net interest payments.).

\( \varepsilon \) = random error term, with mean 0 and uniform variance.

As pointed out by Hnatkovska and Loyaza [5], high inflation can produce harmful effects such as a reduction in employment, an interruption of credit, and a deferment in investment, leading to output losses. We thus choose to include a dummy variable which takes on the value of 1 if the consumer price index (CPI) inflation rate is above 3 percent and 0 otherwise to capture this effect. We expect the coefficient estimate of this variable to have a negative sign.

Kaminsky et al. [6] observe that fiscal policy in developing countries has the tendency of being procyclical by magnifying upswings and worsening recessions, as far as risk management is concerned. To capture the failure of fiscal policy as a tool of macroeconomic policy due to the fact that it has several goals and tools while at the same time
being influenced by the political process, we choose to include two explanatory variables, namely, the share of government primary surplus in the GDP and that of gross of public debt, and expect that the higher the value of the first variable and the lower that of the second variable in a developing country, the more likely the country is preparing for risk, hence, the higher its level of economic development.

To capture the effect sound macroeconomic management before a crisis on development, we include the share of international reserves in the GDP as explanatory variable and expect the coefficient estimate of this variable to have a positive sign. Smaller fiscal deficit and increased international reserves create a buffer that permits developing countries to use countercyclical policies in response to their growth downturns, thereby leading to a much faster recovery.

Another way in which the macroeconomy sector can impact risk management and thus economic development is through flexible exchange rate regimes. Whether a shock came from within or from outside of the domestic economy, flexible exchange rates have a proven track record for absorbing shocks. Edwards and Levy Yeyati [7] show that countries which adopt flexible exchange rate regimes have the tendency of recovering faster and more robustly from deterioration in their terms of trade, while Ramcharan [8] observes the same phenomenon in countries that experienced degradation due to natural disasters. Countries with flexible exchange rates adjust better to shocks that may cause internal or external imbalances (see, for instance, Edwards [9], Lane and Milesi-Ferretti [10], and Ghosh et al. [11]). To estimate this impact we use the coarse classification of flexible exchange rate regimes and expect its coefficient estimate to have a positive sign.

Finally, improved governance can help make the government respond better the needs of the population while being held accountable for its actions. Reinikka and Svensson [12], for instance, reported on how a newspaper campaign in Uganda helped fight corruption in order to improve schooling. Speer [13] argues that a good strategy for raising government responsiveness and for ameliorating public services is participatory governance reform, while Devarajan et al. [14] emphasizes the interaction between civil society, public action, and accountability in Africa. To capture the positive effect of improved governance on economic development, we use the Worldwide Governance Indicators average and expect its coefficient estimate to have a positive sign. Data for all variables are from the 2012 and 2014 World Development Reports [1, 15] and the 2013 World Development Indicators [16].

3. Empirical Results

Table 1 gives least-squares estimates of regression coefficients in (1) for a sample of sixty-three developing economies. The goodness of fit of the model to the data is very good as indicated by the high value of 0.546 of the adjusted coefficient of determination. We observe that four explanatory variables are not statistically significant, namely, the share of the government primary surplus in the GDP, that of gross public debt in the GDP, the coarse classification of flexible exchange rate regimes, and the consumer price index (CPI) inflation rate dummy variable, even though the coefficient estimate of the latter variable does have the anticipated negative sign.

As the share of international reserves in the GDP increases by one percentage point, we would expect a $83 increase in purchasing power parity gross national income per capita, while other things will be equal. On the other hand, a one hundredth of a point increase in the Worldwide Governance Indicators average is expected to lead to a $91 increase in per capita gross national income, ceteris paribus (the reason we choose to increase the Worldwide Governance Indicators average by one hundredth of a point is because the range of values for this variable is only from −2.5 to 2.5 and the data are rounded off to two decimals).

Using the backward elimination stepwise method we arrive at a revised model, the regression results of which are reported in Table 2. We note that the goodness of fit of the model to the data is better as indicated by the higher value of 0.564 of the adjusted coefficient of determination. We observe that two out of three explanatory variables are statistically significant at the 5 percent or lower level and that the coefficient estimate of the consumer price index (CPI) inflation rate dummy variable continues to have the expected negative sign.

We note that the effect of the fraction of international reserves in the GDP and that of the Worldwide Governance Indicators average are roughly the same as was the case in the full model. All else equal, a one-percentage point increase in the share of international reserves in the GDP is expected to lead to a $76 dollar increase in per capita GNI. We also observe that as the Worldwide Governance Indicators average increases by one hundredth of a point, it is expected that per capita purchasing power parity GNI will increase by $94, other things being equal.

4. Conclusion

In this paper we use a statistical model and data from a sample of sixty-three developing economies to empirically analyze the impact of selected indicators related to risk management at the macroeconomy level on the level of per capita GNI. From the statistical results we are able to draw the following conclusions.
Table 2: Empirical results (revised model).

<table>
<thead>
<tr>
<th></th>
<th>Coefficient estimates</th>
<th>t-Statistics</th>
</tr>
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<tbody>
<tr>
<td>Intercept</td>
<td>12448.152</td>
<td>6.634</td>
</tr>
<tr>
<td>CPIInFRat</td>
<td>−1738.526</td>
<td>−0.947</td>
</tr>
<tr>
<td>InterReserves</td>
<td>75.529</td>
<td>1.894**</td>
</tr>
<tr>
<td>GovncInd</td>
<td>9402.489</td>
<td>8.750*</td>
</tr>
</tbody>
</table>

Adjusted $R^2 = 0.564$.
* Significant at the 0.5 percent level.
** Significant at the 5 percent level.

(1) Within the set of developing economies in this study, the higher the percentage of international reserves in the GDP in a developing country, the higher its level of per capita income. Governments in these countries need to set aside a healthy amount of international reserves to better prepare for risk.

(2) Developing countries with a high participatory governance scheme tend to have a higher level of per capita income. This provides compelling evidence that the government can help communities by passing antidiscrimination laws, promoting educational campaigns, and at the same time encouraging dialogues that lead to cohesiveness in the face of diversity. Conversely, the role of communities would be to participate in the governance process in order to improve its quality and enhance the performance of public programs. For instance, the dissemination of information with regard to health and education entitlements and outcomes via community-sponsored social gatherings has enhanced both public services and community participation, resulting in more immunizations, more prenatal care, and less excess school fees (for Uganda, see Björkman and Svensson [17], and for India, see Pandey et al. [18]). These achievements, in turn, are expected to lead to further economic development.

(3) While developing countries in this sample that have inflation rates exceeding 3 percent tend to have a lower level of development, this effect is not statistically significant.

As an item on our agenda for future research, it would be interesting to investigate the impact of risk management at the macroeconomic level on economic development in developed economies and contrast this effect with that in developing countries.

Conflict of Interests

The author declares that there is no conflict of interests regarding the publication of this paper.

Acknowledgments

The author would like to thank an anonymous referee for his comments on and suggestions for an earlier version of this paper and Thi Minh Chi Le for her support during the completion of this paper.

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