



**Measuring the Economic  
Costs of Conflict:  
The Effect of Declining  
Development Expenditures**

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**MEASURING THE ECONOMIC COSTS OF CONFLICT:  
THE EFFECT OF DECLINING DEVELOPMENT EXPENDITURES  
ON NEPAL'S ECONOMIC GROWTH**

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**June 2005**

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## PREFACE

Conflict has increasingly affected Nepal's economic performance since 2001. Economic growth slowed to an average of 1.9% over the FY2002-04 period compared to 4.9% in the decade preceding that. More than 12,000 people have been killed, physical infrastructure has been destroyed, thousands of people have been displaced, economic disruptions have increased and development expenditures have declined sharply.

The study was undertaken to measure the economic costs of the conflict, and the effect of declining development expenditures on Nepal's economic development. This paper uses the Nepal Macro-model to measure it. The paper tries to establish the relationship between development expenditures and economic growth and contribute to improving the understanding of the costs of conflict in Nepal.

The paper *Measuring the Economic Costs of Conflict: the Effect of Declining Development Expenditures on Nepal's Economic Growth* was prepared by Sungsup Ra, Senior Country Programs Specialist and Head, Macroeconomics, Finance, Governance, Regional and External Relations, NRM and Bipul Singh, Economics Officer, NRM. The editorial assistance of Arun Rana is appreciated, and thanks are due to Kavita Sherchan, External Relations and Civil Society Liaison Officer, NRM for finalizing the report.

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## ABBREVIATIONS

CPNM	-	Communist Party of Nepal (Maoists)
FY	-	fiscal year
GDP	-	gross domestic product
NMM	-	Nepal macroeconometric model
PCE	-	per capita expenditure
RMSPE	-	root mean square percentage errors

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## **ABSTRACT**

This paper attempts to measure the economic costs of conflict, focusing particularly on the impact of continued decline in development expenditures on GDP growth. The Nepal Macro-model (NMM) is used to estimate GDP growth under different conflict and no-conflict scenarios of development expenditures. Scenario analysis indicates that if development expenditures decline at the current rate (4.2%), the total GDP growth loss is 8.3% for the FY2005-FY2009 period – an average loss of 1.7% of growth per annum. If the conflict intensifies and development expenditures decline at twice the current rate (8.4%), total GDP growth lost is 10.3% - an average loss of 2.1% points of growth per annum.

## I. INTRODUCTION

The Maoist insurgency in Nepal dates back to February 1996 when the “people’s war” was first launched in the hills of Mid-western Nepal. The Maoists belong to the underground ultra-leftist Communist Party of Nepal – Maoist (CPNM), which rejects the fundamental premises of Nepal’s constitutional monarchy and parliamentary system. The Maoist insurgency sharply escalated in 2001 and has adversely affected economic performance since then. Economic growth slowed to an average of 1.9% over the FY2002-04 period compared to 4.9% in the decade preceding that.

Economic performance has been affected through different channels. More than twelve thousand lives have been lost and physical infrastructures worth at least \$ 250 million have been destroyed (Mahat, 2003). Conflict-related disruptions such as strikes, security checks, blockades, shutdowns, and extortion have increased the costs of economic activity and contributed to an economic slowdown. The conflict has caused internal and external displacement of people. Nearly 400,000 rural families have been internally displaced while thousands others have crossed over to India in search of work<sup>1</sup>. The private investment rate<sup>2</sup> has declined from 15.4% in 1996 to 12.6% in 2004, as private investors have desisted from making investments and foreign investors have stayed away.

The economy has also suffered from a decline in development expenditures, which have fallen by a third since 2001. Development expenditure exceeded regular expenditure for first time in the country’s history in FY2002<sup>3</sup>. Thereafter, development expenditure declined at a rate of 4.2% during FY2002-04 compared with a growth of 10.4% during the 1991-2001 period. Government development expenditures stood at about 6% of GDP in FY2004, down from 9% of GDP in FY2001 (Figure 1). In contrast, government security expenditures almost doubled from 1.6% to 3% of GDP in the same period.

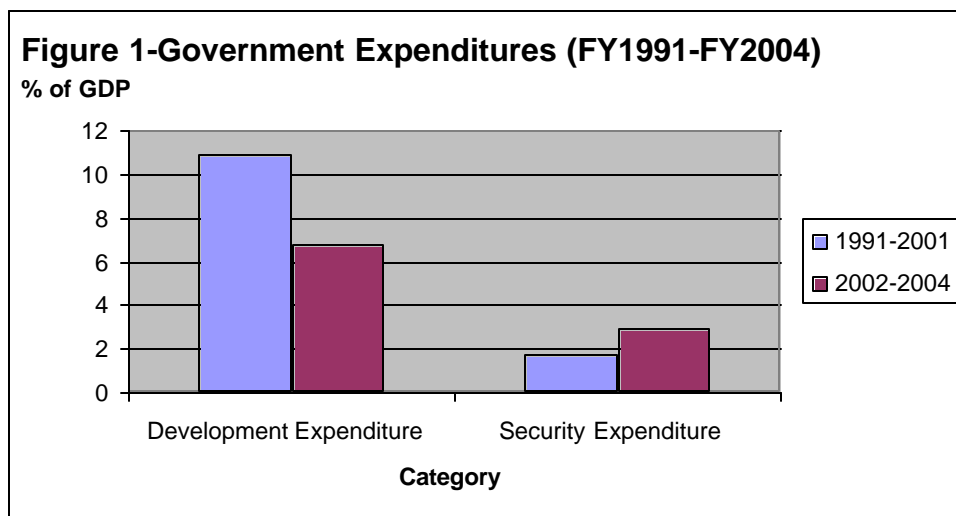
This paper attempts to measure the economic costs of conflict, focusing particularly on the impact of continued decline in development expenditures on GDP growth. Development expenditure is one of variables under the government’s control and therefore most likely to be cut as implementation challenges mount and security expenditures rise. GDP growth estimates for different conflict and no-conflict scenarios are compared to forecast the GDP growth loss resulting from the decline in development expenditure during the conflict. The paper will also help establish the relationship between development expenditures and economic growth.

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<sup>1</sup> The net effect of migration from villages to urban areas and neighboring countries on income and poverty may have been positive. The results of the NLSS II suggest that remittances from migrants contributed to increasing rural incomes.

<sup>2</sup> Gross Fixed Capital Formation as % of GDP

<sup>3</sup> The government has reclassified its reporting format to capital and re-current expenditure since FY2004. However, data in regular and development expenditure classification is also available.



Section II reviews international economic literature on conflict and development. Section IV describes the Nepal Macroeconomic Model and the different scenarios analyzed in this paper. Section V describes the results. It is observed that if the development expenditures continue to decline at the current rate, GDP growth will be 1.7% lower than if there had been no conflict. Section VI concludes.

## II. CONFLICT AND DEVELOPMENT: LITERATURE REVIEW

A number of papers have studied output losses in conflict, including Knight and others (1996), Collier (1997), and Staines (2004). Collier (1997) investigated the consequences of civil war for GDP and its composition using a comprehensive dataset of all of the civil wars during 1960-92. Using a model of the economic effects of civil war and the post war period, the paper finds that GDP per capita declines at an annual rate of 2.2 per cent relative to its counterfactual during civil wars. The explanation proposed in the paper is that the decline is partly because war directly reduces production and partly because it causes a gradual loss of the capital stock due to destruction, dissaving, and the substitution of portfolios abroad.

Staines (2004) explored the dynamics of pre-1990 and post 1990 conflicts - finding significant differences in the duration and costs of conflict in these two periods. Real GDP growth was 1.7 percentage points below normal for conflicts before 1990 - close to the estimates of Collier. However, for conflicts after 1990, real GDP growth was 12.3 percentage points below normal - considerably more than earlier conflicts. Countries with conflicts before 1990 experienced relatively modest contractions followed by lengthy recovery periods during the conflict itself - resulting in levels of real GDP per capita not far below the pre-conflict level and real GDP significantly higher than before the conflict. For conflicts after 1990, the pace and depth of the contractions were much more severe and typically continued to the end of conflict - resulting in levels of output still far below the pre-conflict level.

Knight et al. (1996) investigated the effects of war and quantified a peace dividend using a 79 country data set. The study indicates that warfare has strong negative effect on investment. This is consistent with the underlying presumption of the present paper, namely that civil wars reduce growth mainly by depleting the domestic capital stock in its various forms. Indeed, when Knight et al. control for physical and human capital, together with military spending and trade policy, they fail to find a significant effect of war in their growth regression.

Although no previous study has quantified the growth effects of a decline in development spending, some studies have roughly estimated of the overall costs of the current conflict in Nepal. A Department for International Development study put the costs of conflict at 8-10% of GDP. A study by National Peace Campaign (2004) put the cost of conflict at US\$66.2 billion for the 1996 to 2003 period. However, no studies have, so far, attempted to disaggregate the impact of decline in development spending on economic growth.

This paper attempts to provide more depth to existing analysis on the costs of conflict in Nepal. It fills the gap in the existing conflict related literature on Nepal in at least three ways. The existing estimates of the economic costs of the conflict are not based on macro-econometric analysis and are therefore mainly rough estimates. The paper uses a 37-equation Keynesian income-expenditure model to bring rigor to estimates of costs of Nepal's conflict. A second shortcoming in the existing literature is tendency to lump together the different costs of conflict. This paper takes a first step towards disaggregating the costs by estimating the economic costs of decline in development expenditures. Finally, in contrast to existing literature, this paper is forward looking and attempts to forecast the costs of continued conflict over the FY2005-09 period.

### **III. SIMULATIONS**

The Nepal Macro-economic Model, a medium-sized annual Keynesian model, is simulated to carry out the scenario analysis (Ra, et all 2005). There are 20 behavioral equations, and 17 identities in the NMM. Of the 59 variables in the system, 37 are endogenous and 22 are exogenous. There are 5 building blocks in the NMM: final demand, prices, credit and money, government, and the balance of payments blocks. Final demand is the sum of private consumption, government consumption, private fixed investment, government fixed investment, increase in stock or inventory, and net exports. In NMM, development expenditure is a determinant in the private fixed investment, public fixed investment and public consumption equations.

A shock such as a decline in development expenditure affects the economy through the propagation mechanism across the 5 building blocks. Adjusting to the shock, all the variables go through a dynamic process until the economy finds a new equilibrium with values for each endogenous variable<sup>4</sup>. Baseline estimates of the NMM show that 1% increase in development expenditure results in 1.57% increase in private fixed investment, 0.65% increase in public fixed investment, and 0.18% increase in public consumption. Development expenditure has a lagged and highly sensitive relation with private fixed investment. This could be because private investors extract information about future business conditions from government development expenditure or the government investment may have multiplier effects on private sector. The

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<sup>4</sup> The model is seen to be able to track the historical development of the Nepalese economy reasonably well. The root mean square percentage errors (RMSPE) is less than 10% for most variables and most importantly, the performance of forecasting GDP is excellent: RMSPE is only 3.9

correlation of development expenditure is stronger with public fixed investment than public consumption.

## A. Scenarios

The following three scenarios are analyzed using the NMM:

- (i) **No-Conflict:** Development expenditure grows at the historical (FY1991-FY2001) growth level of 10.4% for five years.
- (ii) **Conflict:** In this scenario, development expenditure is projected to decline by 4.2% for five years. This is the conflict level of growth as recorded during the FY2002-FY2004 period.
- (iii) **High Conflict:** In this scenario, development expenditure is projected to decline by 8.4% for five years. This growth rate is twice the current rate of decline of development expenditures to reflect further intensification of the conflict.

GDP growth estimates under the no-conflict scenario are compared with estimates under conflict scenarios. The economic cost is measured as the economic growth lost in the conflict scenarios in comparison to the no-conflict scenario.

## B. Results

Government consumption, government investment and private investment are explained by development expenditure. Development expenditure is also a key component of government expenditure identity in the government block. A decline in development expenditure reduces government consumption, government investment and private investment – lowering GDP growth. This is consistent with the theoretical models of Solow (1992) and Barro (1991).

If the conflict continues for the next five years and development spending declines at the current rate, the total GDP growth loss because of the decline in development spending is 8.3% for the FY2005-FY2009 period – an average loss of 1.7% of growth per annum. (Table 1). If the conflict intensifies and development expenditures decline at twice the current rate, total GDP growth lost is 10.3% - an average loss of 2.1% points of growth per annum.

**Table 1: NMM Scenario Analysis: GDP Growth Loss**

	<b>Conflict</b>	<b>High Conflict</b>
FY2005	1.3	1.7
FY2006	1.6	2.0
FY2007	1.7	2.1
FY2008	1.8	2.2
FY2009	1.9	2.3
<b>FY2005-09</b>	<b>8.3</b>	<b>10.3</b>

#### **IV. CONCLUSION**

The economic growth loss attributed to the decline in development expenditures – 1.7% per annum for the conflict scenario and 2.1% for the high conflict scenario - for the FY2005-FY2009 period in the simulations is well within the 3% overall growth loss observed for the FY2001-2004 period. If the FY2001-04 patterns of growth are assumed for the FY2005-09 period, the simulations show that up to 57% of the loss in economic growth could be due to the decline in development expenditures. It is observed that the annual costs increase with each successive year of conflict. This is because the effects of decline in development expenditures accumulate each year, affecting GDP growth more as the conflict lengthens.

The above simulations do not estimate the effects of destruction of economic infrastructure, displacement of people, and disruption of economic activities on GDP growth; the impact of lower private investments in the conflict is also not fully reflected. The overall cost of the conflict for the FY2005-09 period is likely to be higher. Also, the effects of the conflict on GDP growth will persist well after the conflict is over, as low development spending during the conflict will have lowered the economy's capital stock and development expenditures will take time to recover fully.

It is worth noting that the 3% GDP growth foregone by Nepal during the conflict is much lower than 12.1% growth loss estimated by Staines (2004) for conflict-affected countries in the 1990s and more closer to the 2.2% loss estimated by Collier (1997) for pre-1990 conflict countries. Unlike the majority of the countries analyzed by Staines, Nepal has benefited from a steady flow of remittances from overseas economies. This is likely to have significantly ameliorated the adverse effects of the conflict on income and poverty. However, 1.7% growth attributed to decline in development expenditures in the conflict scenario is a significant proportion of the overall growth loss.

The poverty implications of the above results are significant. At the conflict rate of decline in development expenditures, GDP per capita is forecast to be 7.8% lower over the FY2005-09 period in the conflict scenario than the no-conflict scenario. This implies a poverty rate 4.8% higher than the no-conflict scenario.<sup>5</sup> The decline in development expenditures is of special concern for poverty reduction because it reduces the future productive capacity of the economy and has long-term consequences for the country. Low expenditure in areas such as education, health, and infrastructure suppresses private sector investment in the country, with adverse impact on incomes and the poverty situation in the country. Urgent efforts are, therefore, required to reverse the decline of development expenditures and limit the adverse effects of the conflict on the economy.

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<sup>5</sup> Nepal's total elasticity of poverty reduction with respect to growth has been negative 0.6%, i.e. every percent in growth of PCE resulted in 0.6% reduction in the number of poor.

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