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Direct and Indirect Effects of Conflicts, Violence and War on Economic Growth in Sri Lanka

ABSTRACT

This study shows that the ethnic conflict, violence and war between and within communities have adversely affected the economic growth in Sri Lanka during 1960-2005 period. The thrust of this study is to show the various adverse impacts of conflicts and war on economic growth. Empirical findings based on Ordinary Least Squares (OLS) estimation using time series data collected from various annual reports of Sri Lanka used in this study shows that conflict, violence and war, measured by a proxy measure of annual growth rate of tourist arrivals, scaled from zero (peace) to ten (conflict, violence and war) scores, negatively and significantly affects the economic growth. Sri Lanka has lost an average of 2.53 per cent annual growth rate due to the direct effect of conflict, violence and war. Due to indirect effects of conflict, violence and war, the country has lost an average of 1.03 per cent and 1.5 per cent annual growth by the way of reduced physical capital accumulation and reduced human capital accumulation respectively. If Sri Lanka had not had conflicts and war, it would have achieved an average of 10.06 per cent growth during 1978-2005 period. Though Sri Lanka achieved moderate growth during war time, inflation, lose of external value of rupee, increased public debt etc. had been impediments to achieving other macroeconomic objectives.

Key words: Sri Lanka, peace, conflicts, violence, war, socio-political instability, and economic growth

INTRODUCTION

Despite of severe economic setback in Sri Lanka owing to the conflict, violence and war, studies on economic cost of conflict and war have been inadequate particularly among Sri Lankan scholars. More than one hundred thousand people have lost their lives and many disappeared due to the conflicts, violence and war in Sri Lanka during last five decades.[1] Most of them are LTTE carders, Sri Lankan soldiers, members of Janatha Vimukrhi Peramuna (JVP), member of other Tamil military movements and innocent public. The vast majority of them came from rural areas. As Lakshman notes (1997:16)

" *it could be hypothesized that many institutional, cultural, political and other peculiarities of the country, not captured in the policy critique of mainstream economic discourse were behind Sri Lanka's failure to economically keep up with those other countries which, four decade ago, were at either parallel or inferior conditions*…"

This study tends to investigate such sociopolitical peculiarities which have retarded the economic growth and hence economic development of Sri Lanka.

Sri Lanka which is a small and beautiful island nation in Indian Ocean with extent of 65610 km^2, had around 20.7 millions population (Central Bank of Sri Lanka, 2007). Though Sri Lanka is a multi ethnic, multi lingual and multi religious nation two main ethnic groups, Singhalese and Tamils, have been playing a dominant role. According to 1981 Census, the population consists of 74 per cent of Sinhalese who are predominantly Sinhala- speaking Buddhist[2]. The Tamil speaking ethnic minorities constitute Sri Lankan Tamils (13%), Indian Tamils (6%) and Sri Lankan moor (7%). Among Sinhalese majority, there is a small proportion of Christians. The ethnic minorities, speak Tamil as their mother tongue, is consisted primarily by two ethnic groups namely, Tamils and Muslims.[3] Sri Lanka Tamils predominantly live in the Northern and Eastern regions while also have strong presence in the capital, Colombo. Indian Tamils reside mainly in the plantation areas of the central

[1] National peace council (2001)

[2] This figure based on national census 1981. After 1981, national census was conducted in 2001. Population data in ethnic composition in 2001 census excludes the north and east provinces.

[3] Currently, a significant number of Muslims use Sinhala as their mother tongue

highlands and in Western province. Muslims have a strong presence in the Eastern region and also in urban areas throughout the island.

Sri Lanka's civil conflicts can be explained in two points of view. Firstly, conflict, violence and war have been between the largest Sinhala majority and the largest Tamil minority. Secondly, there has been sporadic conflict and violence, (not war) within Sinhala and Tamil communities. According to first view, conflict, violence and war between two communities have been important phenomenon in Sri Lanka because it has severely affected the economy. Clashes between the Sinhalese and the Tamils gradually became more violent and led to bloody war. Though the antagonism between two communities dates back as far as 150 B.C., the intensity of the violence has never been as intense as after 1983 (Grober, and Gnanaselvam,1993). Kristian (1998), Kristian and Anne (2000) using previous studies short list the causes for struggle for Tamil Eelam in Sri Lanka as follows (1) The disfranchising of citizenship of Indian Tamils, (2) Creation of Sinhalese settlement in Tamil areas, (3) Declaration of Sinhala as the only official language, (4) Discrimination against Tamil people in the public sectors employment, (5) Introduction of special university admission policy in favor of Singhalese student, (6) Lack of public investment for regional development in Tamil dominated area, (7) Series of broken Singhalese – Tamil pacts (8) Sporadic and systematic anti-Tamil violence.

According to the second view, while the discriminative policies of successive governments widened the gap between ethnic groups, there was a regional economic disparity within Sinhala community. The movement of the educated and unemployed rural Sinhala youth led by JVP engaged in an armed struggle with a view to changing government which was in 1971. It is clear evidence that the frustrated educated youth rebelled against the government policies. Further, the JVP engaged in the second insurrection against the deployment of Indian Peace Keeping Forces (IPKF) in the North East of Sri Lanka during 1987-89 periods. On the other hand, there were rifts within Tamil speaking communities. This internecine fighting took place between several Tamil armed groups and there was antagonism between the LTTE and Muslim people in the Northeast. Of particular, the eviction of more than hundred thousands Muslim people by the LTTE from the North was a severe blow to the ethnic cohesion between Tamil and Muslim communities.

2. CONFLICT, WAR AND ECONOMIC GROWTH

Among the macroeconomic goals, economic growth plays an important role in development. Michael and Smith (2006) and Barro and Sala-I-Martin (2004) emphasize that development must be accompanied with economic growth without which development looks like tree without roots. Unfortunately, in many developing countries like Sri Lanka with liberal democracy, social development took placed without growth due to several reasons (Amirthalingam, 2008a and 2008b). Ludovic (2003) states that the living standard of people in a country is a direct result of the dynamic interdependent of economic, political and social forces which are closely related with peaceful environment. For the economic development based on globalization, peace has been key determinant of economic growth. Steven and Goldstein (1999) mention that even though the successful economic development of newly industrialized countries (NICs), particularly Singapore, has been achieved through market based policies, importantly peace with sociopolitical stability without ethnic antagonism in their multi-ethnic societies was the major factor behind their success. According to Snodgrass (2008), despite of ethnic heterogeneity Malaysia achieved rapid growth.

Conflicts, violence and war increase the uncertainty and risk which may be harmful to the investments hence economic growth and development. Even though conflict and war adversely affect the economic growth, the end of civil war may contribute positively to economic growth. Seonjou and James (2005) show the effects of civil war on economic growth in various situations. However they agreed on that there is no generalized theory has been established on the duration and contributing factors of war on the postwar economic growth. There is polarization among scholars on the relationship between civil war and economic growth. The first view is that the war contributes to economic growth positively owing to technological innovation, improvement of efficiency, employment generation and reducing the power of rent seeking. The second view is that the war negatively affects the economic growth through the destruction of resources, inflation due to increased defense expenditure, unproductive resource allocation and war related debt. Collier (1999) shows destroying, disrupting, diverting and depleting national resources are

the four ways through which war affects the GDP. Murdoch and Todd (2002) found the negative and significant relationship between civil war and economic growth. They show that direct effect of conflicts and war is more than indirect effects such as migration of human capital and decline of investment. Further, according to them, short run effects are more than long run effects.

Economic analyses must integrate the social and political factors. Joachim (2002) shows that distinction of economic development among countries in the world is basically determined by sociopolitical causes rather than economic causes. Harold (1997) in a cross country study concludes that military expenditure is positively correlated with economic growth by improving property rights. Abu-Bader *et al* (2003) show in a cross country analysis that military expenditure positively affects economic growth. Therefore according to theory, conflict and war can affect economic growth positively or negatively.

In 1950s, Sri Lanka was the third richest country in Asia after Japan and Malysia (Rajapathirana,1988) but it is so behind to these East Asian countries today. As quoted in Banda (2003) architect of Singapore, Lee Kuan Yew states that

"My first visit to Sri Lanka(then Ceylon) was in April 1956……..I was impressed by the public buildings… undamaged by the war … more resources and better infrastructure than Singapore……. During my visit over the year, I watched a promising country go to waste. One- man- one-vote did not solve a basic problem….. it is sad that the country whose ancient name Serendip has given the English language the word 'serendipity' is now the epitome of conflicts…. and hopelessness".

What are the major causes which slowed down the economic growth in Sri Lanka comparing East Asian countries? Especially, why Sri Lanka could not achieved rapid economic growth even it has considerable resources for development. In south Asia, Sri Lanka was considered to become a 'little Singapore' in 1978 following the introduction of trade liberalization which had been adopted by Newly Industrialized Countries(NICs) in succeeding rapid growth and development. However, while Sri Lanka achieved just only a moderate 5 per cent annual average growth, NICs achieved around 10 percent growth during 1960-2005. This study hypothesizes that socio-political instability bred by conflicts, violence and war between and within the communities in Sri Lanka have been key factors for the lackluster performance of economic growth during 1960-2005.

The study of Abeyratne (2004) has been one of the most important recent literatures in relation to conflict and economic development in Sri Lanka. His study analyses the economic roots of political conflicts and war in Sri Lanka. According to Abeyratne

"*Social exclusion of groups from the mainstream process of change, resulting from the contradictions in the development process, forms the foundation for the emergence of political conflict. The twin political conflict in Sri Lanka has its roots in the contradictions in the country's post-independence development process which made slow down of economic growth, resulting from economic policy errors".*

Further, Abeyratne emphasizes that if Sri Lanka had pursued liberal economic policy (without returning to closed economy during 1970-1977) since 1965 continuously, Sri Lanka would have avoided conflicts and war. Slow down of economic development in Sri Lanka has been rooted due to the ethnic and regional based political and economic policy errors. Democratic violence had been transformed to military violence and diverted resources of economic development to war during the liberalized economic policy. Economic development of Sri Lanka is impossible unless the peace has been established. At same time, Tamils politicians should bear in mind that demand for a separate state and anti-government slogans will not solve the problems confronted by the Tamil People. If the Sri Lankan government put forwarded a realistic political solution with full scale implementation, achieving rapid growth and hence development will not be a daunting task.

3. DATA AND MODEL SPECIFICATION

Various studies have adopted different methods to investigate the effects of conflict and war on macroeconomic variables such as growth, inflation, FDI and exchange rate stability. In Sri Lanka, previous studies conducted by Arunatilake *et al* (2000& 2001), Grober and Gnanaselvam (1993) and National Peace Council (2001) have measured the cost of war by using defense expenditure. They combined the pre1983 period and post 1983 period to measure the cost of the war by using defense expenditure. Their models and results are reported as

$I = f(y_p, G_m, K, D)$ - Grobar and Gnanaselvam (1960-1988)

$GINV = f(G_m, K, D77, DWAR)$ - Arunatilake *et al* (1960-1996)

Where, I is investment expenditure as percent of GDP, y_p is per capita income, G_m is government's military expenditure as percent of GDP, K is capital inflows, D is dummy for UNP government which adopted more open market policies, GINV is government's capital expenditure and lending to investment, D77 is dummy for period 1960 -1977, DWAR is dummy for year, 1983, 1990, 1995.

$$I = \underset{(9.33)}{10.15} + \underset{(5.56)}{0.13\, y_p} \underset{(4.13)}{-1.44\, G_m} + \underset{(6.41)}{0.39K} \underset{(2.51)}{+2.31\, D_{t-2}}$$

$R^2 = 0.94$

$$\Delta GINV = \underset{(4.45)^*}{18.18} \underset{(0.52)}{-0.39 DG_m} \underset{(3.35)^*}{-1.69\, DG_{m\,t-1}} \underset{(1.09)}{-0.42 \Delta K} \underset{(1.53)}{-0.54\, K_{t-1}} \underset{(4.63)^*}{0.72 GINV_{t-1}}$$

$$\underset{(3.91)^*}{-9.43 D77} \quad \underset{(1.52)}{-2.5 DWAR}$$

$R^2 = 0.50$ (* is one percent significant)

There are many methodological problems in using defense expenditure as a measure of conflict and war in relation to losses of investment and output. First, series of defense expenditure which combined pre and post 1983 period does not have stationary properties.[4] Higher value of R^2 in Grobar's model obviously raises the doubt on regression results which might have been affected by autocorrelation. Second, their model estimations based on defense expenditure can not be established by simply combining pre and post 1983 period because war and defense expenditure had been mostly sensitive to investment only after 1983 in Sri Lanka. Third, their investment models do not include local and foreign saving and interest rate which have been key determinants of investment in Sri Lanka. Forth, both studies use capital inflows to examine the impact of foreign capital on investment. But practically capital out flow also determines net total investment. Arunatilake's model has failed to show the main sources to finance the public investment

[4] Probability value of ADF statistics for series of defense expenditure as percent of GDP and investment as percent of GDP are 0.76 and 0.88 respectively.

in Sri Lanka because all independent variables of government's investment expenditure functions are negative in their model. If all independent variables of investment affect government's investment negatively, the question arises that what are the sources available to finance government investment. Further correlation between the percentage change of public investment expenditure and defense expenditure as percentage of GDP, lag GDP during 1960-1996 is 0.05, 0.053 respectively. This implies that there may be no exact negative relationship between public investment and defense expenditure. Indeed, public investment growth rate has been higher than growth rate of private investment during 1983 – 1989. It means that reduced private investment due to the war had been recovered by increased government investment on the war and other public projects.

It is obvious that the defense expenditure has a crowding out effect on total national investment. Beyond direct effect of conflicts and war on investment due to the uncertainty, direct losses and damages of private and government assts, government's increased defense expenditure reduced the public investment such as education, health, and economic infrastructures. Increased defense expenditure in Sri Lanka has been explained by policy makers as investment for social infrastructures and defeating terrorism to attain peace in Sri Lanka. Increased defense expenditure induces employment and output also. Totally, in short run, increased defense expenditure does not reduce output. But proportion of public and private investment has changed during the war. Measuring investment and defense expenditure as percentage of GDP in the context of war may lead to misleading result since investment expenditure include some war related investment expenditure such as fighter jets, naval ships, military vehicles and other long run investment for war related activities. Furthermore, war increases the employment generation as well. All these activities in relation to the war will have a favorable impact on GDP.

For instance, around zero (0.032) simple correlation between total defense expenditure (both current and capital as percentage of GDP) and total investment expenditure (both public and private investment as percentage of GDP) during 1983-2005 implies that measure of defense expenditure for estimation of investment loss can not be a good measurement because after exclusion of one outlier of observations in 1983, this correlation becomes 0.34. The correlation between GDP growth rate and defense expenditure as percentage of GDP is also around zero. (-0.06) during 1983-2005. These results

substantiate that defense expenditure is not an efficient solid measure to estimate the effects of conflicts and war on economic growth. Beyond problems of time series properties for model estimation, if we see the history, ethnic antagonism turned towards democratic violence(1956-1983) and to armed struggle (after 1983). There has been no war before 1983 in Sri Lanka. Rebellion of JVP in 1971 was mainly crushed by Indian forces not by Sri Lanka's increased defense expenditure. There were many incidents which led to the government impose curfews for many days in Colombo and other parts of Sri Lanka during conflict. All these conflict related incidents, without increasing defense expenditure before 1983, had affected the confidence of local and foreign investors and increased migration of educated people to various countries had adverse impacts on the available physical and human capital in Sri Lanka. Due to this type of time series, methodological and historical reasons, our study uses a proxy variable to measure conflicts, violence and war in Sri Lanka.

Measurement of Conflicts, Violence and War

Direct measurement of degree of conflicts, violence and war would be difficult and risky in any country including Sri Lanka due to restriction on media freedom, unreliability and/ or unavailability of data, unavailability of time series data, and self security of researchers. Therefore the degree of conflicts and war (CW) (opposite is the degree of peace) rooted by socio-political and economic factors together is measured by a single proxy measure, namely annual growth rate of tourist arrivals in Sri Lanka, in this study. Tourism is an important sector which is more sensitive to violence and war in Sri Lanka. This study takes the highest growth rate of tourist arrivals of 1950 (88 %) as zero score (peace) and lowest growth rate of tourist arrival of 1961 (-50%) as ten scores (violence and war).

In most years, CW is correlated negatively with economic growth. According to our measurement, the intense conflicts and violence reported in 1961. Large scale 'Sathyagraham' (a non violent protest), blockade of Jaffna Kacheri (District Secretariat) for one month, separate postal service in Jaffna and disobedient movement in the Northeast organized by Federal Party (FP) led first military presence in Tamil areas in 1961 and it lasted for two years. Moreover, the conflict within Singhalese community in 1971

and during 1987- 1989 affected the growth severely. Conflicts and violence became intensified after 'Black'July of 1983 and subsequently economic growth started to slow down. The arrival of IPKF aggravated the instability of the economy not only in the North and East but also in other parts of Sri Lanka during 1987-1989 period. However, the withdrawal of IPKF and peace talk between the government and the LTTE in 1990 reduced the instability of the economy of the country. Degree of conflict between and within communities was lower in 1990 as compared with other years.

Annual growth rate of tourists arrival, proxy variable for measurement of conflicts and war, in this study may have been affected by other determinants of tourist arrivals such as openness and devaluation of currency in Sri Lanka. If these determinants would have affected our proxy measure, our estimation of effects of conflict and war on growth may be misleading. The simple correlation between annual growth rate of tourist arrivals (not score of CW) and openness (export plus import divided by GDP) is -0.18 (positive correlation was expected) and correlation between growth rate of tourist arrivals and the depreciation rate of rupee against US Dollar is nearly zero (positive correlation was expected) during 1960-2005. These correlations clear that selected proxy measure has not been affected by other determinants of tourist arrivals than conflict and war. The years 1990 and 1994 experienced increased number of tourists arrivals because more attempts initiated for peace during these two years. However, the years 1997 and 1999 which registered significant numbers of tourist arrivals amid intensified war situation are considered as outliers in this study. Selvanathan (2006) also shows that war has affected international tourists arrivals than other factors in Sri Lanka. Therefore we strongly believe that our proxy is more suitable than other measures for measuring conflict, violence and war in Sri Lanka. (See figures 1 and 2 for verification and validation of proxy).

Empirical studies which analyzed the relationship between conflicts, war and economic growth have used Harrod-Domar growth model (Grober and Gnanaselvam, 1993) and classical and new classical growth models (Dimitrios Asteriou and Simon Price, 2001 and Richard J**o**ng - A- Pin, 2006). Our study uses new classical growth model to analyze the

effects of conflicts and war on growth. Following models are used to estimate the effects of conflicts and war on growth.

Specification of model

$EG_t = g (PCA_t, HCA_t, OPEN_t, CW_t)$ - Short run direct effects

PCA>0, HCA>0, OPEN>0 and CW<0

$PCA_t = f (NS_t, FS_t, RR_t, D78_t, CW_t)$, - Short run indirect effects

NS>0, FS>0, RR<0 and CW <0

$HCA_t = f (EDE_t, RUS_t, D78_t, CW_t)$ - Short run indirect effects

EDE>0, RUS>0 and CW<0

$EG_t = g (PCA_t, HCA_t, OPEN_t, CW_t, CW_{t-1}, CW_{t-2})$ - Long run direct effects

$PCA_t = f (NS_t, FS_t, RR_t, D78_t, CW_t, CW_{t-1}, CW_{t-2})$, - Long run indirect effects

$HCA_t = f (EDE_t, RUS_t, D78_t, CW_t, CW_{t-1}, CW_{t-2})$ - Long run indirect effects

Where, EG, PCA, HCA, OPEN and CW stand for the economic growth; physical capital accumulation; human capital accumulation; openness; and conflicts and war respectively. Economic growth is measured by annual GDP growth rate. Physical capital accumulation is measured by annual growth rate of total investment expenditure. Human capital accumulation is measured by a proxy variable, annual growth rate of graduated students. Openness is measured by usual measure, ratio of annual exports plus imports to GDP. Openness plays three roles in this model. It represents as a measure of policy environment to economic growth, as a measure of technological progress to economic growth and as a measure of foreign trade to economic growth. Data for all variables are taken from various annual reports of Central Bank of Sri Lanka.

4. EMPIRICAL RESULTS AND ANALYSIS

Our models identify two important indirect channels which influence the economic growth and at the same time are affected by conflict and war.

1. Physical capital accumulation
2. Human capital accumulation

Both channels include technological progress within them. For an example foreign direct investment, domestic private investment and donors' financial assistance for investment projects are combined with technological progress. Improvement of higher education and the spending of government for research and development also increase the potential of country to attain technological progress. Both physical and human capital accumulations, critical ingredients for economic growth, are affected due to conflict and war in any country including Sri Lanka.

Conflict, Violence and War and Physical Capital Accumulation

We measure the physical capital accumulation (PCA) by total investment expenditure.

$PCA_t = f(NS_t, FS_t, RR_t, D78_t, CW_t)$,

Where, PCA stands for annual growth rate of total real investment expenditure and NS stands for annual growth rate of real national saving. FS is for foreign saving for investment measured by annual growth rate of net sum of foreign direct investment and long - term government's capital and other private investment. All measures are in Million US Dollar. RR stands for real interest rate, measured by average interest rate for one year fixed deposit minus inflation rate. D78 is dummy variable for economic policy environment and take one during 1978-2005. CW stands for measure of conflict and war related environment in Sri Lanka. Probability values of ADF test statistics for unit root, 0.0001 for INVE and RR, 0.0002 for ICW and 0.0000 for NS and FS confirm that all series are stationary.

PCA = 25.1 + 0.11NS + 0.092FS – 0.83RR + 14.4 D78 – 3.46CW (1)

(2.84) (1.23) (2.66) ** (1.61) *** (3.25) ** (2.44) **

R^2 = 0.44, DW =1.94, F=6.3 n = 46

PCA = 43.47 + 0.0766NS + 0.087FS – 0.65RR + 14.5D78 –2.63CW –3.97CW_{t-1} (2)

(4.31)* (0.98) 2.66) ** (1.31) (3.49)* (2.01) ** (3.11)*

R^2 = 0.52, DW =2.16, F=7.01, n = 45

Equations have statistical properties[5]. According to the equation 1, the growth rate of investment is affected by conflict and war negatively and significantly in Sri Lanka in the short run. One score increases in CW leads to reduction of 3.46 percent of annual real growth rate of real investment. In the long run, if we take one lag of CW, one score increases in CW reduces the investment growth rate by 6.6 percent (2.63 percent due to the current year's violence and 3.97 percent due to last year's violence). The instability of current year has more and strong significant effects on the investment of next year. But it looses the significant after two year (Not reported). Foreign savings to finance investment plays a considerable positive role and statistically significant in Sri Lanka. Local saving does not affect investment significantly.

Total annual loss of investment in long run (annual physical capital accumulation loss) is estimated from equation 2. Average invested investment as per cent of GDP is 21.36 per cent and as annual average growth rate of investment is 16.65 per cent. If peace had been continued as it was in 1950, average investment as percentage of GDP would have been reached to 28.53 per cent and annual growth rate of investment would have been 54.6 per cent during 1960-2005 period. Average investment loss as percentage of GDP is 7.17 percent (28.53-21.36) and average annual growth rate of investment loss is 37.98 per cent

[5] Since p value of Jarque -Beta is 0.23 for 5.1 and 0.29 for 5.2, the normality assumption of residual is not rejected. The Breusch-Godfrey asymptotic test for auto correlation up to forth order in model 5.1 and 5.2 gives a P value more than 0.71. So the hypothesis of zero autocorrelation in the residuals is not rejected. The Ramsey RESET test for specification error has a P value of 0.64 and 0.84 and therefore there is no significant evidence of misspecification of model. Overall tests are favorable in theses models.

(54.6-16.65) during the same period. These losses in investment due to the conflicts and war are higher during the post 1978 period than pre 1978 period. During pre-1978 period, these losses are 4.92 per cent as a percentage of GDP (20.59-15.67) and 36.18 per cent in term of growth rate of investment (46.16-9.18). During the post 1978 period, these are 8.6 per cent (33.62-25.02) and 39.09 per cent (60.03- 20.94) respectively.

From 1960 to 2005, Sri Lanka has lost Rs 1440.268 billion investment owing to conflict, violence and war. It is 60 per cent of GDP in 2005 current prices. The total lost during 1960 -1977 and 1978-2005 are Rs 10.974 billion and Rs 1429.294 billion respectively. According to the estimation of National Peace Council (NPC) during 1982- 2001, total investments losses (In billion Rupees) are

Investment loss due the increased defense expenditure excess 1.5 percent GDP		
and excess 0.6 percent in public safety	=	435.117
Investment loss due to the LTTE expenditure on war	=	74.550
Investment loss due to the refuges and displacement	=	53.000
Investment loss due to the damages and reconstruction		
at 2001 price (constant)	=	230.330
Total loss of investment based on the direct estimation of NPC	**=**	**792.997**
Total investment loss based on our regression methods using proxy measure	**=**	**833.96**[6]

Conflict, Violence and War and Human Capital Accumulation

Sri Lanka has lost a large number of individuals, many were in their productive years since the beginning of conflicts and war. According to Arunatilake *et al* (2000 & 2001), the total number of the members of armed forces, including police and the Special Task Force, were killed since the outbreak of war in 1983 until January 1, 1997 was 10,014. In addition, some 13,545 armed force personal were reportedly wounded in action. The reported number of LTTE casualties during this period varies widely depending on the source. According to the defense ministry as quoted in Arunatilake *et al*, the number of LTTE carders died was 22,116. National Peace Council (2002) has estimated the total number of deaths due to the war from 1983 to 2000 was approximately 65,000. Human Rights Secretariat of North and East (2005) reported that the total civilian deaths due to the war

[6] Investment loss is higher than previous study. Loss of investment is calculated in real term

in North and East were 35,323 and the total disappearance was 2,483 during the 1974-2004 period. Marshall (2006) reports that total deaths were 1,000 and 25, 000 in 1971, and in 1989 respectively due to conflicts within Sinhala community but 75, 000 deaths occurred due to the war between LTTE and the government during 1983-2006.

In addition, the "brain drain" caused by conflict and war, also adversely affects the growth in Sri Lanka. Total migration from Sri Lanka is estimated to be between 1.5-2 million over 20 years in Sri Lanka (Dhananjayan, 2002). Among these migrants many are from Tamil origin. As quoted in Dhananjayan, (2002) shows that UNHCR estimated the stock of internationally displaced Tamils to be 817,000, most of whom are/were refugees or asylum seekers .Canada topped the list, hosting an estimated 400,000 Tamils, followed by Europe, (200,000), India (67,000), the United States (40,000), Australia (30,000), and another 80,000 living in a dozen of other European countries by June 2001. Conflict and war induces not only unskilled workers but also many educated Sri Lankan to migrate to many countries like Canada, Australia and Europe.

Beyond the direct human capital losses owing to deaths, disappearances, disability, and trauma, skilled migration and other forms of damages to human capital, conflicts and war have affected the human capital accumulation by the ways of reduced government expenditure in education (importantly higher education), research and training and disturbance of educational activities. These types of loss adversely affect the economic growth. New classical growth model shows the importance of spending in human capital accumulation. This study considers the annual growth rate of graduated students as proxy measure for human capital accumulation. Annual growth rate of under graduates is determined by many factors in Sri Lanka. it is obvious that due to increased defense expenditure, allocation for education, particularly for higher education, grossly in adequate in Sri Lanka for a long time. Following model is used to analyze the effect of conflict and war on human capital accumulation in Sri Lanka.

$HCA_t = f(EDE_t, RUS_t, D78_t, CW_t)$

Where HCA, EDE,RUS and D78 are human capital accumulation measured by annual growth rate of graduates, the expenditure of government on education as percentage of

GDP, growth rate of annual registered university students and dummy variable for open economy respectively..

$$HCA = \underset{(0.42)}{-22.92} + \underset{(1.83)^{***}}{24.2EDE} + \underset{(2.8)^{*}}{0.99RUS} + \underset{(2.05)^{**}}{42.63D78} - \underset{(3.12)^{*}}{12.37CW} \quad (3)$$

$R^2 = 4.2$, n = 46, WD = 1.7, F = 5.4

According to the equation 3, CW negatively and significantly affects human capital accumulation. One score increase in CW leads to around 12 percent reduction of annual growth rate of graduated students. Open economic policy, growth rate of registered students and government's expenditure on education affect human capital accumulation positively and significantly. The degree of statistical significant to CW is higher than other determinants. Long run effects of conflicts and war is less than the short run effects. Even conflicts and war negatively affect growth rate of human capital in the short run, the part of short run loss (around 4 percent) is recovered in long run. It is shown by equation 4.

$$HCA = \underset{(0.34)}{-18.98} + \underset{(1.11)}{16.07EDE} + \underset{(2.67)^{**}}{0.99RUS} + \underset{(1.56)}{34.59D78} - \underset{(3.34)^{*}}{15.43ICW}$$

$R^2 = 4.7$, n = 44,

$$+ \underset{(0.01)}{0.01CW_{t-1}} + \underset{(1.76)^{***}}{7.45CW_{t-2}} \quad (4)$$

$R^2 = 4.7$, n = 44, WD = 1.72, F = 4.24

Long run net effect of CW has around 7.98 per cent reduction of annual growth rate in human capital. One score increase in CW leads to reduction of around 8 percent of annual growth rate of graduated student in long run which is 4 percent lower than short run effects. Another important concern is that owing to war and conflict in Sri Lanka for more than two decades many graduates (skilled labor force) and trained laborers have migrated mostly to Europe, Canada, US, Australia legally or illegally. It is important to note that our study includes only degree holders to estimate human capital accumulation but in fact both degree holders and other non degree trained labors have migrated due the war. However, it is difficult to measure the loss of these human capitals fully due to the lack of data in regard to skilled migration on yearly basis. When we include skilled migration fully, the loss of human capital due to war and conflict will be more than that of our estimation.

Direct Effects of Conflicts and War on Economic Growth

First, with achieved rate of growth in both capitals amid the conflicts and war the direct effects of CW on growth can be measured. The loss of physical and human capital due to the CW is not included. Indirect effects of CW through the capital accumulation on economic growth in the short and long runs would be included later. The coefficients from 46 year annual data for the period of 1960 – 2005 are estimated. We reject null hypothesis of unit root for all series since probability values of Augmented Dickey Fuller test statistics are significant at one percent level. The series which have been explained in this study do not have time trends but they are stationary.

The Table 1 illustrates the direct effects of war and conflicts. The first column of Table 1 illustrates the theoretical determinants of economic growth using regression results. Signs and significance of coefficients are consistent with theory. The effects of economic policy environment on economic growth are positive and statistically significant. According to our model conflicts and war negatively affect growth in short run (see column 3 of Table 1). One score increasing of CW during the 1960-2005, leads to around 0.44 percent reduction of economic growth. This negative effect exceeds the positive effects of physical capital accumulation (0.027*13.8 = 0.373) as well as positive effect of human capital accumulation (0.017*13.8= 0.234) on economic growth in short run. Conflicts and war have led Sri Lanka to maintain sluggish economic growth even though the country has dynamic human resource and granted attractive incentives to investors. Although current year's conflict and war has negative effect on next year's economic growth in direct channel, it loses its significant level in next year. This effect becomes positive after three years (two year lags), but it is not significant. Long run direct effects of conflicts and war are reported in the forth and fifth columns in table 1. However, third, fourth and fifth lag effect of conflicts and war have negative effects without statistical significance (not reported). It indicates that the long run effect of war on growth in Sri Lanka is also negative. Long run effect depends on nature of conflicts and war. If conflicts, violence and war are stopped permanently, the previous period's war would affect current period's economic growth positively in the ways of increasing public and private investments via rehabilitations activities.

It is important to note that the Sri Lankan rupee was devaluated against nominal US Dollar by 22.4 and 75.9 per cent respectively in 1968 and 1978 following the economic reforms. If devaluation could have induced the tourist arrivals to Sri Lanka, CW computed from tourist arrival would be misleading. Even after exclusion of these two extreme observations from our sample, conflict and war has negative and significant effect on economic growth in short run which is reported in last column of table 1.

Short Run Direct and Indirect Effects of Conflicts and War on Growth

Physical and human capital accumulations and economic growth are adversely affected due to conflict and war in short run. One score increase of WC leads to 3.46 percent reduction of annual growth rate of physical capital accumulation and 12.37 percent reduction of annual growth rate of human capital accumulation in short run[7]. When multiplying these coefficients by the degree of CW, the annual total loss of growth rate of physical capital accumulation in short run (TLPCAS) and total loss of human capital accumulation in short run (TLHCAS) can be computed. One percent growth rate of physical capital leads to 0.027 percent increasing of economic growth and one per cent growth rate of human capital leads to 0.017 per cent increase of economic growth. When multiplying the loss of growth rate in both capitals due to the conflict and war by corresponding coefficients of both capitals, the indirect losses of economic growth can be computed. With this indirect losses of growth, the loss of growth due to direct effects of CW is added and now it is possible to compute the total losses of economic growth rate in short run (TLGRS) owing to the conflicts and war in Sri Lanka. Total losses includes the direct losses (due to the conflict and war) and indirect losses of growth rate (due to the reduction of physical and human capital accumulation, caused by conflict and war). Direct and indirect growth losses in short run are estimated by using following equations.

TLGRS = 0.027TL PCAS + 0.017TLHCAS + 0.44CW

TLGRS = 0.027(3.46CW) + 0.017(12.37CW) + 0.44CW

In short run study (current year's effect of conflict and war on current year's economic growth), average expected economic growth of Sri Lanka in the absence of conflicts and war during 1978-2005 should have been 9.25 per cent. However, the country has achieved

[7] Short run means current year's effect of conflicts and war on current year's growth.

only 4.84 per cent average rate of growth. This clearly indicates that if conflict, violence and war were absent in Sri Lanka during this period, the economic growth would have been approximately double to what the country has achieved amid conflict, violence and war. Figure 3 shows the short run effects of conflicts and war on growth.

Long Run Direct and Indirect Effects of Conflicts and War on Economic Growth

Generally conflict and war inflict more adverse impacts on economic growth in the long run than in the short run. This study considers that three year (current year and two lags) as the long run to estimate the effects of CW on economic growth. As it is stated in previous section, the long run direct effects of CW on growth is negative and insignificant but long run indirect effects of CW due to the losses of physical and human capital accumulation are negative and significant. This study takes into account only statistically significant effects of long run analysis[8]. Following equations are used to estimate the total loss of growth rate in the long run (TLGRL) due to the conflict and war. Figure 4 shows the long run effects of conflicts and war on growth.

TLGRL = 0.027TL PCAL + 0.017TLHCAL + 0.44 CW

TLGRL = 0.027(6.6CW) + 0.017(15.43ICW) + 0.44 CW

According to our estimations(stated in the Tables 2 and 4), total loss of real output (Rs 857.6 billions) during 1978-2005 is higher than that of previous period, 1960-1977. The loss as a percentage of GDP of 1977 is 36.26 per cent during 1960-1977. It is around close to 33.6 percent of GDP of 2005 during 1960-2005 since the magnitude of economy during 1978-2005 was much larger than previous period. Around one third of output had been lost due to the conflict and war in both periods. Here, we see some previous studies which have estimated the loss of output due to the war in Sri Lanka.

[8] If we consider the insignificant negative effect of CW in long run, the effects will be higher than this estimation

Studies and Year	Estimated loss of components	GDP loss as percentage of GDP in 1988 during 1983-88
Grobar and Gnanaselvam (1993)	Loss of output due to the reduced investment	20%
Arunatilake *et al* (2000 &2001)	Loss of output due to the Reduced investment	6.3%
Our Study (2008)	Loss of real output due to the reduced investment (Sort run)	2.78%
Our Study (2008)	Loss of real output due to the reduced investment (Long run)	5.27%

Since our study estimates the loss of output in real term rather than nominal term, according to our study loss of output is less than that of previous studies measured. In fact, only 4.56 percent average economic growth has been achieved during 1960-2005 period. If conflict and war could have been avoided completely, Sri Lanka would have been attained 9.62 per cent average growth rate during 1960-2005 and 10.06 percent average growth during 1978-2005 which would have been more than an average 7.1 per cent growth rate of Singapore and 9.18 per cent of growth rate of China. Therefore one can conclude that Sri Lanka had lost average of 5.23 per cent growth rate due to the conflicts and war caused by both conflict within communities and between communities during 1978-2005. Figure 5 depicts various losses of economic growth in Sri Lanka. This forgone growth is two times more than that of the country achieved. This finding clearly indicates that if Sri Lanka had enjoyed peace, the living standard of people would have been doubled than what they have now. Furthermore, moderate economic growth in Sri Lanka has been achieved by loosing other macroeconomic objectives such as maintaining low level of inflation, reducing public debt, avoiding privatization of public assets and maintaining stability of external values of rupee (See Table 4) due to the increased military expenditure significantly.

5. CONCLUSION

Conflict, violence and war caused by socio-political factors in Sri Lanka have played a key role in determining short run and long run economic growth than traditional factors of production such as capital, labor and technology. It is obvious that conflict and war between and within communities have adversely affected short run and long run economic growth directly and indirectly during 1960- 2005 period. Direct effects have affected the economy mainly owing to the slow down of tourist arrival and destruction of the resources. Indirect negative effects have affected the economy thorough the reduction of physical and human capital accumulation which are key determinants of economic growth. Sri Lanka had lost average of 5.23 per cent annual growth rate due to the conflicts and war between and within communities during 1978-2005 period. Sri Lanka would have attained average of 9.62 per cent and 10.06 percent growth rate during 1960-2005 and 1978-2005 respectively, if the country had avoided the conflict and war. Direct loss of conflicts and war on growth during 1960 -2005 is an average of 2.52 per cent per years. Indirect loss through the loss of human capital accumulation and physical capital accumulation are 1.5 and 1.02 per cent per year respectively. In sum, this study concludes that if Sri Lanka would have doubled economic growth during 1978-2005, if the country avoided the conflicts and war.

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Figure 1: Verification of proxy with major incidents

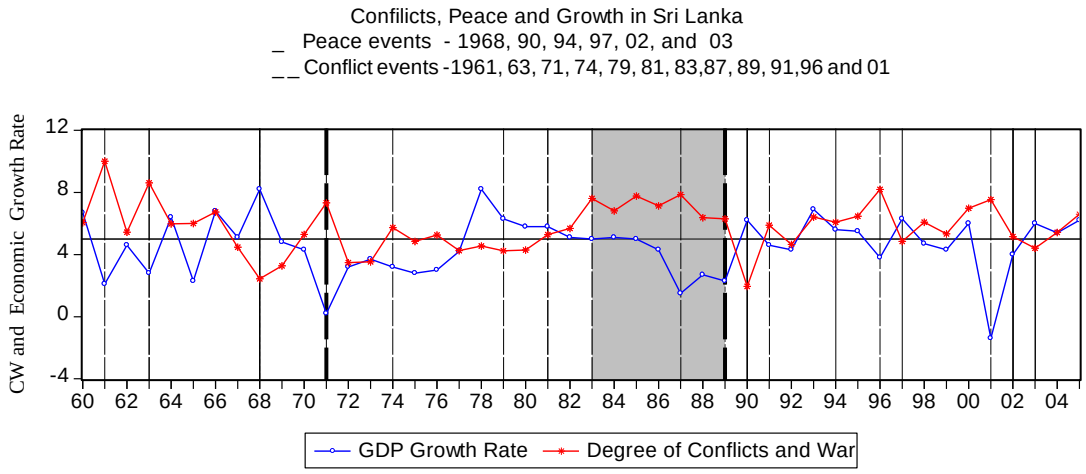

Figure 2: Correlation between CW and Economic growth

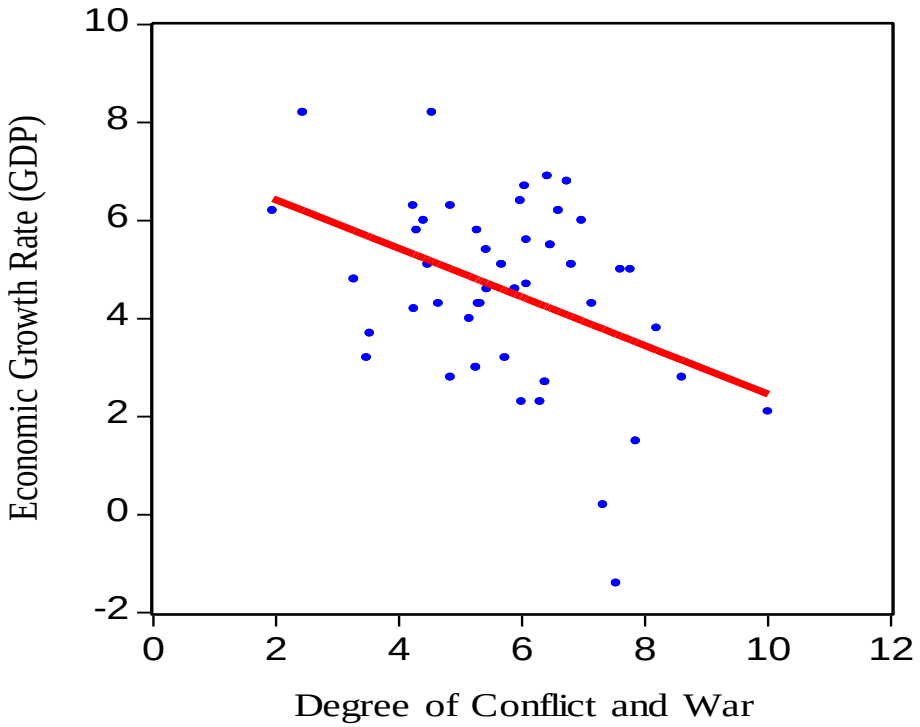

Figure 3: Direct and Indirect Effects of CW on Economic Growth in the Short-Run

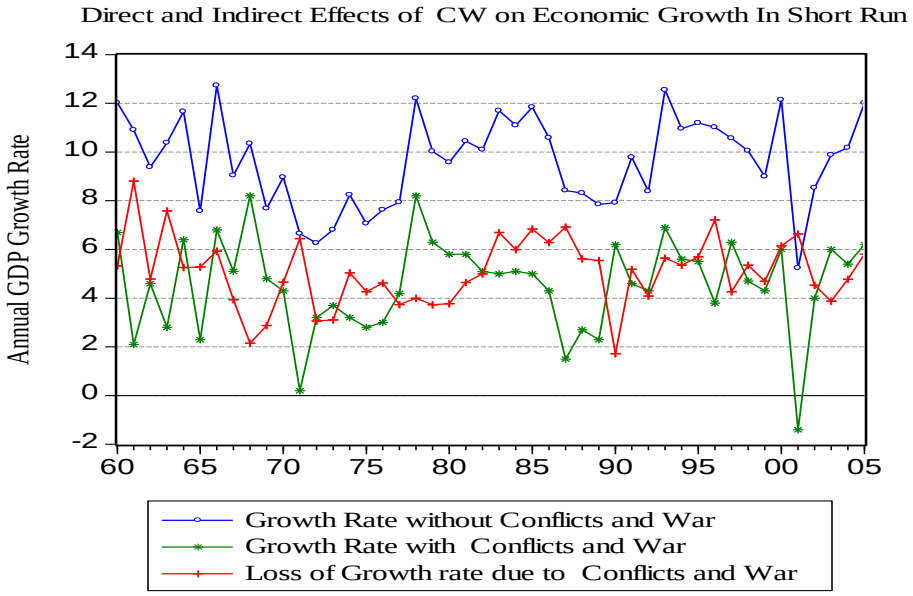

Figure 4: Direct and Indirect Effects of CW on Economic Growth in the Long-Run

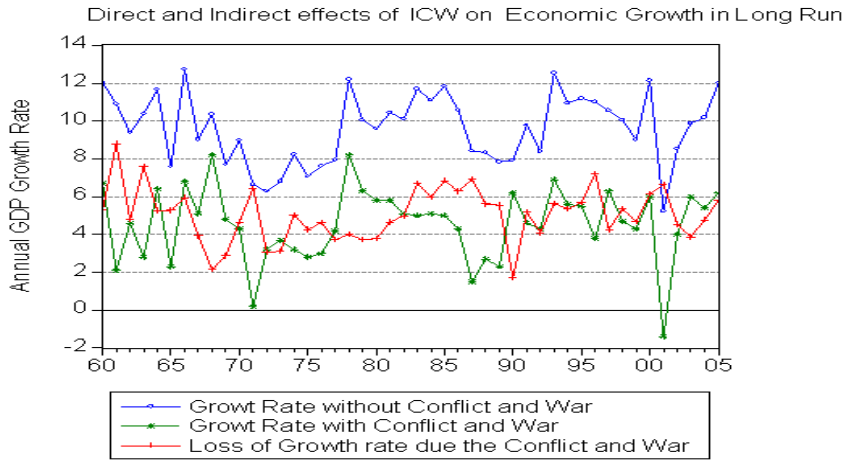

Figure 5: Effects of Conflicts and War on Economic Growth

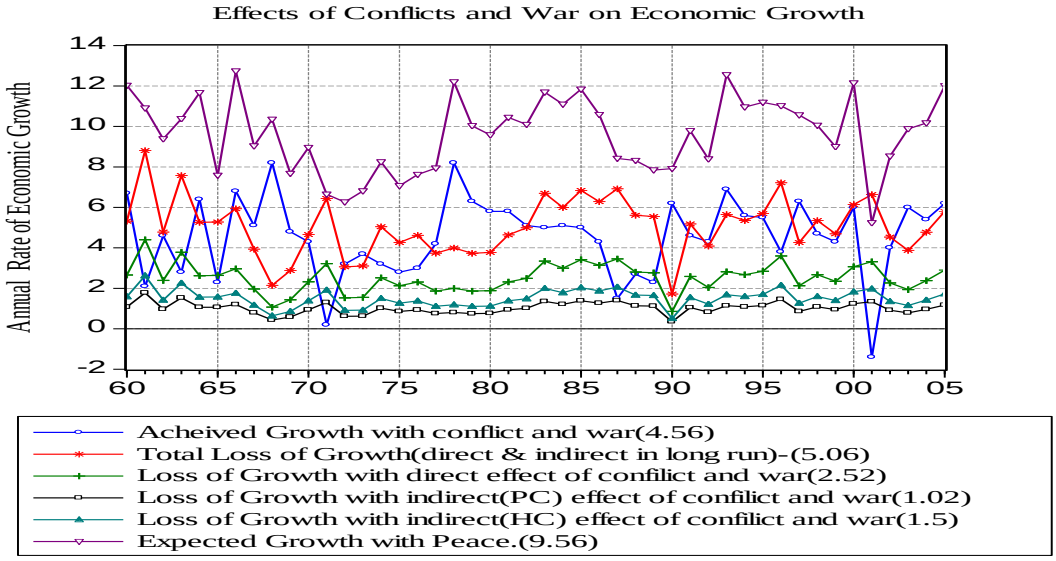

Table1: Direct impact of conflict and war on economic growth (1960-2005)

(Dependent Variable: Annual GDP growth)

	(1)	(2)	(3)	(4)	(5)	(6)
PAC	0.049[a]	0.042 [a]	0.027 [b]	0.018 [c]	0.033 [c]	0.023
	(3.68)	(2.86)	(1.87)	(1.84)	(1.81)	(1.52)
HC	0.011 [b]	0.0111 [b]	0.017 [b]	0.016 [b]	0.016 [b]	0.015 [b]
	(2.36)	(2.3)	(2.49)	(2.49)	(2.35)	(2.22)
OPEN		0.026 [C]	0.04 [b]	0.036 [b]	0.035 [b]	0.041 [a]
		(1.73)	(2.66)	(2.33)	(2.14)	(2.73)
ICW			**-0.44 [b]**	**-0.40 [b]**	**-0.374 [c]**	**-0.364 [b]**
			(2.59)	**(2.38)**	**(1.85)**	**(2.07)**
ICW(-1)				**-0.003**	**-0.004**	
				(0.019)	**(0.026)**	
ICW(-2)					**0.011**	
					(0.07)	
R^2	0.320	0.365	0.481	0.482	0.464	0.420
F-statistics	10.12	8.06	9.28	6.9	5.04	6.9
DW	1.86	1.9	1.59	1.69	1.69	1.69
Observations	46	46	46	45	44	44

Regressions are estimated by ordinary least square methods. Significant levels are indicated by a, b and c which denote 1 percent, 5 percent and 10 percent respectively. t- Statistics are in parentheses. Probability values of Breusch-Godfrey asymptotic test for serial correlation, test for ARCH residuals, the white heteroscedasticity test and the Ramsey RESET test for our models 3, 4 and 5 are more than ten per cent. Intercept has been included but has not been reported in table.

Table 2: Total loss of real output in short run during different time periods

Period	Due to the Reduced Physical capital(Indirect)		Due to the Reduced Human capital(indirect)		Due to the conflict and war(direct)		Total lost of out put (direct and indirect)	
	Rs B	As % of GDP*	Rs B	As % of GDP*	Rs B	As % of GDP*	Rs B	As % of GDP*
1960-2005	92.3	3.9	208	8.77	435	18.39	734.5	31.1
1960-1977	1.28	3.51	2.9	7.91	6.29	16.56	10.19	27.99
1978-2005	91.0	3.85	205	8.65	429	18.12	724.4	30.63
1978-1982	1.31	1.32	2.95	2.97	6.18	6.22	10.44	10.5
1983-1988	6.17	2.78	13.9	6.25	29.1	13.06	49.1	22.11
1983-1989	7.47	2.96	16.8	6.6	35.2	13.96	59.48	23.61
1990-1994	9.23	1.59	20.8	3.59	43.5	7.51	73.49	12.67
1995-2001	41.11	2.92	86.2	6.12	180.3	12.79	304.7	21.65
2002-2005	34.7	1.46	78.1	3.3	163.5	6.91	276.3	11.68

*Percentage GDP is estimated as percent of end year of period

Table 3: **Total loss of real output in long run during different time periods**

Period	Due to the Reduced Physical capital(Indirect)		Due to the Reduced Human capital(indirect)		Due to the sociopolitical instability(direct)		Total lost of out put (direct and indirect)	
	Rs B	As % of GDP*	Rs B	As % of GDP*	Rs B	As % of GDP*	Rs B	As % of GDP*
1960-2005	176	7.44	259	10.95	435.1	18.39	869.7	36.77
1960-1977	2.44	6.7	3.59	9.86	6.29	16.56	12.0	33.6
1978-2005	173.6	7.34	256	10.8	429.2	18.12	857.6	36.26
1978-1982	2.5	2.52	3.7	3.72	6.18	6.22	12.4	12.5
1983-1988	11.7	5.27	17.3	7.79	29.1	13.06	58.1	26.17
1983-1989	14.3	5.63	21	8.33	35.2	13.96	70.4	27.9
1990-1994	17.6	3.03	25.9	4.47	43.5	7.51	87.0	15.0
1995-2001	73.0	5.18	107	7.64	180.3	12.79	361.0	25.6
2002-2005	66.2	2.79	97.4	4.12	163.5	6.91	327.1	13.82

Table 4. Political Regime and Macroeconomic Stability in Sri Lanka

Periods	Degree Conflict and war	E. growth	inflation	Growth-inflation	MES^9_1	MES^{10}_2
1960-65(SLFP)	7.0	4.1	1.15	3	-33.7	-42.8
1966-70(UNP)	4.4	5.8	4.2	1.62	-30.6	-69.6
1971-77(SLFP)	4.91	2.9	5.7	-2.8	-3.6	-131.4
1978-89(UNP)	6.07	4.75	12.6	-7.8	-37.5	-64
1990-94(UNP)	5.75	5.52	13.0	-7.5	2.48	-128.9
1995-99(SLFP-Led)	6.18	4.92	9.46	-4.5	-28.8	-58.8
2000-01(SLFP-Led)	7.25	2.3	10.2	-7.9	-39.7	-1043.2
2002-03(UNP)	4.77	5	7.95	-2.95	-3.3	-62.8
2004-05(SLFP-Led)	6.0	5.8	9.1	-3.3	-4.1	-98.2

Source: Computed from various annual reports of central bank, Sri Lanka.

Note: $RGRT_t$, $RRESER_t$, $RINF_t$, $RUEMP_t$ and $REXDEP_t$ are percentage change of real GDP, percentage change of Colombo consumer price index, unemployment rate and percentage change of depreciation of rupee respectively. Percentage change of public debt ($RPDEPT_t$), grants (RGRANT) and privatization proceeds (RPRIVAR) are measured in US$ to eliminate the inflation. Average of all years in regime periods has been reported.

[9] $MES_1 = f\{ RGRT_t + RRESER_t – RINF_t – RUEMP_t – REXDEP_t - RPDEPT_t \}$

[10] $MES_2 = MES_1 - RGRANT - RPRIVAR$