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Conflict Prevention and Reconstruction Unit

Social Development Department *Dissemination Notes*

The Economic and Social Costs of Armed Conflict in El Salvador

January 2003 *Number 8*

El Salvador's civil war (1979-91) had devastating economic and social costs. This note estimates the ground lost in terms of growth forgone, higher poverty and worsened social indicators. Had the conflict been avoided, income per capita could be almost double in 2000, the poverty rate lower by 15 percentage points and Millenium Development Goals social indicators substantially better. El Salvador's experience shows that conflicts are not only extremely costly in economic and social terms, but that recovery takes an inordinate amount of time, even with very good post-conflict policies and reforms.

Background

With an area of 21,000 km^2, a population of approximately 6.4 million and per capita GDP of US$4,500 (PPP) in 2000, El Salvador is the smallest country of Central America and the most densely populated in the Western Hemisphere. Gross inequalities in wealth and income built up since the early part of the 20th century, and historical disaffection with land inequality severely exacerbated social tensions during the 1970s. The country's political system was ill equipped to deal with these tensions.

A series of confrontations between peasant and organized labor groups and the government led to increasingly repressive government responses over the decade, gradually closing all legal avenues for peaceful opposition. In the late 1970s groups of students, peasants and trade unionists opted out of the political and electoral system founding a number of guerrilla organizations. Army and paramilitary death squads embarked on a counter-insurgency, which in turn led to the expansion of the guerrilla movement and an increase in political violence. The violence reached a dramatic apex in March 1980 with the murder of the archbishop of San Salvador, Oscar Romero by a paramilitary squad. Although the guerilla movement, unified under the *Frente Farabundo Martí para la Liberación Nacional* (FMLN), failed to spark a national rebellion, it effectively carried out a low-intensity guerilla war establishing strong areas of influence in the north and east of the country.

In 1989, the new administration of President Cristiani came to office determined to bring an end to the conflict. Several key agreements in 1991 culminated in the Peace Accords signed in Mexico on January 16, 1992. The Peace Accords brought an end to a conflict that had no winner but many losers. The civil war cost some 75,000 lives, displaced 1 million people (about 20 percent of the Salvadoran population in the early 1990s), and infrastructure was estimated to have a replacement value of US$1.6 billion, the significance of which becomes apparent when compared with a GDP of just over US$5 billion in 1990. The armed conflict, however, also had enormous indirect costs (both economic and social) that go beyond these estimates of direct damages. In this note we attempt to provide estimates of these economic and social costs.

First, one might consider the dramatic cost in terms of GDP losses. Over the period 1979-1991 (the start and end of the conflict according to the Center for Defense Information (CDI) which records and dates worldwide armed conflicts involving at least 1,000 casualties in a single year) real per capita GDP fell by an impressive 75 percent. Moreover, despite a strong economic recovery in the aftermath of the signing of the Peace Accords, El Salvador's current real per capita income is still about 20 percent lower than it was in 1978. This is in sharp contrast with the experience of the Latin America and Caribbean (LAC) Region as a whole, which recorded an increase of almost 30 percent in real per capita income over 1979-91, and about 60 percent for 1978-00.

Second, as a result of lower economic growth, per capita output is also lower, which in turn should result in higher poverty levels and a worsening of social indicators. To the best of our knowledge, there are no estimates of the social costs of the conflict, in terms of poverty levels and key social indicators. This note builds on results by Wodon et al.[1] and Lopez[2] to assess the impact of El

[1] Wodon Q., R. Castro-Fernandez, G. Lopez-Acevedo, C. Siaens, C. Sobrado, and J.P. Tre (2001). Poverty in Latin America: trends (1986-1998) and Determinants, LCR, The World Bank, Washington, D C.

[2] Lopez. H. "The Cost of Armed Conflict in Central America", LCR, The World Bank, Washington, D.C

Salvador's conflict on a set of indicators that capture the essence of the MDGs.

The impact of growth on non-monetary indicators

The importance of growth for poverty reduction is well documented in the economic literature. GDP growth seems to have little effect on income distribution and therefore a one percent increase in aggregate growth tends to increase proportionally the mean income of any given quintile.[3] But beyond the money metric approach to poverty measurement, there is also empirical evidence pointing toward the positive impact of growth on non-monetary indicators of well being. For example, Wodon et al. (2001) present cross country elasticities for a set of social indicators to growth. These social indicators would capture the essence of the MDGs and include infant mortality, under-5 mortality, and child malnutrition in the health sector, net primary enrolment ratio, net secondary enrolment ratio, gross tertiary enrolment and adult illiteracy in the education sector and telephone line[4] density in the infrastructure sector. In the computation of these elasticities, Wodon et al. make use of an econometric specification that takes into account the level of urbanization, time, and the country's level of development (as reflected by the level of GDP per capita in US$PPP).

Table 1: Elasticities of Social Indicators to Growth

	Per Capita GDP (US$PPP)	
	2,500-5,000	5,000-10,000
Infant mortality	-0.37	-0.35
Under-5 mortality	-0.47	-0.37
Child malnutrition	N.S.	-1.1
Net primary enrolment	0.02	0.04
Net secondary enrolment	0.32	0.23
Illiteracy rate	-0.05	-0.11
Gross tertiary enrolment	0.23	0.69
Telephones	0.90	0.52

NS = Not significantly different from zero.
Source Wodon et al (2001)

Table 1 reports the estimated elasticities for two segments of per capita GDP (US$PPP). They suggest that for a country such as El Salvador (with real per capita GDP of US$4,500 at PPP prices) a one percent increase in GDP would reduce infant mortality by 0.37 percent. But once the country reaches per capita GDP of US$5,000 the impact of an additional one percent increase in GDP would reduce infant mortality by 0.35.

Lost growth: intervention analysis

We noted above the dramatic fall of per capita GDP during the conflict years, and in this regard it seems reasonable to assume a significant impact of the war on GDP. The question we address now refers to the magnitude and time profile of such impact. To estimate the impact we rely on time series intervention analysis techniques. Briefly, these techniques allow the decomposition of GDP growth into a "regular" component that would capture the dynamics of GDP in the absence of extreme shocks, and a second component that would capture aberrant behaviors caused by extraordinary events such as an armed conflict.[5] Further we allow these aberrant observations or outliers to affect the "regular" component of growth according to three different time profiles: (i) additive, which would capture a pulse or a one single shot to the growth rate in a year; (ii) level shift, which would represent an outlier with permanent significant effects on the growth rate; and (iii) transitory shift, which would capture disturbances with long-lasting but decaying effects.

We perform the empirical procedure both on per capita GDP growth and on GDP growth. The results using GDP growth are then converted into per capita GDP assuming no changes to the population profile. For each dependent variable we construct the virtual GDP series under three scenarios. In the first, we do not introduce any control and hence the statistical problem is reduced to an outlier search and correction procedure. The second scenario controls for the evolution of the global economy (as captured by the median growth rate in the LAC Region). The third and final scenario also controls for external factors that are country specific. We do this by introducing, in addition to the median growth rate in the LAC Region, the terms of trade of goods and non-factor services as explanatory variables. We therefore compute virtual GDP series under six different scenarios, something that in principle should ease concerns regarding the sensitivity of the results.

The implementation of this procedure for El Salvador would identify in every case two transitory shifts corresponding to 1979 and 1980 (the first and second years of the conflict). We estimate that in 1979, when per capita GDP declined by 6 percent, growth could have been as much as 2.5 percent.

[3] This result has been recently stressed by Dollar D and A. Kraay (2000), "Growth is Good for the Poor", DRG, The World Bank, Washington, D.C.

[4] Since the cross-country correlation between the number of telephone lines, and electricity generated and paved roads is 0.8 and 0.7 respectively, this variable can be considered as a good proxy for infrastructure in general.

[5] See Lopez (2001) for technical details

Table 2: El Salvador—The Social Cost of the Armed Conflict

	ACTUAL	VIRTUAL					
		Per Capita GDP			GDP		
		RAW[1]	LAC[2]	TOT[3]	RAW[1]	LAC[2]	TOT[3]
Per Capita GDP (US$PPP)	4,500	8,413	8,451	8,387	9,045	7,932	8,705
Poverty							
Poverty Head Count (%)	41	25	25	25	23	24	23
Health							
Infant Mortality	29	23	23	23	23	24	23
Under-5 Mortality	35	27	27	28	27	28	27
Child Malnutrition	12	7	6	6	6	7	6
Education							
Net Primary Enrolment	82	84	84	84	84	84	84
Net Secondary Enrolment	35	41	41	40	41	41	40
Illiteracy Rate	18	17	17	17	17	17	17
Gross Tertiary Enrolment	18	26	28	28	29	29	26
Infrastructure							
Telephone Lines	10	14	14	14	14	14	13

1. No controls; 2. LAC growth rate as control; 3. LAC growth and terms of trade (TOT) as control.

For 1980, when per capita GDP declined by 13 percent, we find that GDP growth could have been above 3 percent. This correction for 1980 (16.3 percentage points) could be split into the effect being caused by the 1979 transitory shift (estimated at -5.9 percent) and by the new transitory shift shock (estimated at about -10 percent). The half-life of the transitory shifts is estimated at about two years (i.e., every two years the impact of the shocks on the regular component of growth is halved). The virtual GDP series would now be computed by assuming the corrected GDP growth rates.

Table 2 reports actual and virtual GDP (US$PPP) together with actual and virtual social indicators for El Salvador in 2000 for each of the scenarios described above. The column under the heading RAW reports results for the model without controls. Under heading LAC it is possible to find the results for the model that controls for the evolution of the global economy. Finally, under the heading TOT we report the results that also include the terms of trade as explanatory variable.

Table 2 indicates that depending on the statistical assumptions virtual per capita GDP would vary from a minimum of US$7,932 to a maximum of US$9,045. That is, our lowest estimate for the virtual per capita GDP would suggest an income level that is about 75 percent larger than the actual value in 2000. Our highest estimate would suggest income levels that double those observed in 2000. Thus, El Salvador's income per capita could have been between 75 to 100 percent higher in 2000 had the conflict not occurred.

What would have been the impact on poverty? These figures would suggest that in the absence of the armed conflict, the poverty rate could be lower by about 15 percentage points and hover around 25 percent, or close to poverty rates in Costa Rica—a neighboring country that did not experience conflict and that has been able to maintain remarkable progress in fighting poverty and improving social conditions.

Beyond its devastating toll on per capita GDP and headcount poverty, we also find the armed conflict to have had significant negative impact on social outcomes and especially on health indicators. We estimate the armed conflict to account for about 6 percentage points of the observed infant mortality rate (29 per thousand) and for about 8 percentage points of the observed under-5 mortality rate (35 percent). A more significant effect is found on child malnutrition where about half of the malnutrition rate can be explained by the conflict. We estimate that in the absence of the conflict the malnutrition rate could be around 6 percent.

Regarding the education sector, our estimates suggest that in the absence of the conflict all the indicators would show an improvement, but this would be especially the case for secondary and tertiary enrolment rates. This may be explained by the different role that economic considerations take for dropping out of school at different schooling levels (less important for primary education).

Finally, on infrastructure we also find that the conflict may have had a significant negative effect. Our estimates suggest that in the absence of the armed

conflict telecommunications coverage could be about 40 percent higher than actual. As noted in footnote 2, we could expect similar results for other infrastructure indicators such as electricity and paved roads.

Conclusions

This note has presented estimates of the social costs of El Salvador's armed conflict (1979-1991). To this end we have constructed a virtual per capita GDP series that simulates the level of income that El Salvador might have enjoyed should armed conflict not have taken place. GDP growth losses are translated into social losses by means of the cross country elasticities of a set of social indicators to growth. The social indicators have been chosen so that they capture the essence of the MDGs.

All in all, the results suggest significant social costs. Our lowest estimate of virtual GDP indicates that should armed conflict not have taken place, El Salvador's per capita GDP in 2000 could be at least 75 percent higher than its actual value; that the poverty headcount could have been lower by 15 percentage points, child malnutrition halved to about 6 percent, and infant mortality cut by one-fourth from its current levels. We also argue that in the absence of the conflict the country's education indicators would be significantly better, especially in secondary and tertiary education where enrolments (35 and 18 percent respectively) could be 6 and 10 percentage points higher, and that public infrastructure coverage could be higher by about 40 percent.

El Salvador is considered a relative success story in post-conflict reconstruction. There has been no renewal of conflict, it has undergone a smooth transition to democracy, growth has revived, especially in the immediate post-conflict period, and over the past decade the Government has maintained prudent macroeconomic policies and implemented major structural, social and institutional reforms. Despite this impressive track record, a decade after the fighting stopped El Salvador's economy remains considerably behind where it was in terms of output level when the conflict started and has lagged substantially in terms of poverty and social indicators.

El Salvador's experience shows that armed conflicts are extremely costly not only in terms of lives lost and physical damage incurred, but also in terms of opportunities forgone — opportunities to increase output, to reduce the number of households living in poverty, and to improve social welfare. Even with very good policies it takes an inordinately long time to recover lost ground. This underscores the importance of making every effort to prevent armed conflicts from erupting in the first place if the Bank and the international community are going to succeed in the fight against poverty.

CPR Unit

This Dissemination Note was prepared by Humberto Lopez, World Bank Country Economist for El Salvador, and edited by the Conflict Prevention and Reconstruction (CPR) Unit. This note series is intended to disseminate good practice and key findings on conflict prevention and reconstruction. The series is edited by the CPR Unit in the Social Development Department of the Environmentally and Socially Sustainable Development Network of the World Bank. The views expressed in these notes are those of the authors and do not necessarily reflect the views of the World Bank Group, its Executive Directors, or the countries they represent. CPR Dissemination Notes are distributed widely to Bank staff and are also available on the CPR website (http://www.worldbank.org/conflict).

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