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ECONOMICS OF WAR-TORN COUNTRIES

A POLITICO-ECONOMIC APPROACH

APPLIED TO GUATEMALA

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In Memory of Juan Gerardi

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ABSTRACT

The overarching objective of this doctoral research is to integrate key political and conflict-related variables in the analysis of war-torn economies. For, as we conclude from a critical review of the literature on war, reconstruction and the economy, politics must be fully taken into account in economic analysis and planning. This is especially true during the fragile transition from war to peace to the extent that rebuilding efforts are vain if the conflict rekindles. In this dissertation, we elaborate on two complementary methodological approaches aiming at including distributional and political concerns in economic research on conflict-ridden countries. We test them in a case study on Guatemala and discuss their respective merits and limitations.

The dissertation first focuses on the social accounting framework as a tool for distributional analysis. We construct a social accounting matrix (SAM) for Guatemala, based on which we calculate accounting multipliers. Multiplier effects are decomposed into transfer, open-loop and close-loop effects following the logic of the circular flow of income. The ensuing SAM-based model serves to simulate the distributional impact of several fiscal reform options on different socioeconomic groups. This in turn helps design politically-informed economic reform.

We then present an analytical model that enables to capture the fundamental interactions between the economic and political spheres. We address in particular the dilemma posed by the diverging agendas of peace-building and economic reform, both of which are required in the aftermath of a protracted conflict to put the economy back on track and consolidate peace. The analytical framework highlights how the optimal policy mix from a government's perspective differs from the economic optimum advocated by the international financial institutions. Subsequently, a macroeconometric model is built, and tested in the context of our Guatemalan case study which requires the construction of ad hoc political and economic data sets.

We then ask how coherent are the different responses devised by the international community to assist war-torn countries rebuild themselves. To this end, we run simulations of external interventions in the form of increased conditionality related either to economic reform or to peace-building. The outcome highlights stark contradictions between these two

types of conditionality because of their induced effects in the economic and political spheres, thus calling for increased coherence in the global response of the international community.

The dissertation is structured under three modules: critical literature review, distributional analysis, and politico-economic interactions. The originality of this doctoral research lies in the inclusion of conflict- and peace-related variables in distributional analysis and macroeconometric modelling. In the case of Guatemala, the model proves to have a stronger forecasting ability than traditional models limited to economic variables only. The politico-economic approach elaborated in this dissertation offers an avenue for further research on war-torn economies, all the more so that the major methodological obstacles are being removed: the lack of reliable data is being addressed by a more systematic collection of information on violence and conflicts while recent econometric software packages considerably ease the computational process.

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I. INTRODUCTION

A European economist who served as an adviser to the Rwandan Government from 1990 to 1994 was recently invited to assess his performance in retrospect of the 1994 Genocide. As his advisory job was strictly confined to macroeconomic issues, he insisted on the fact that he was not supposed to analyse the political impact of economic measures. Although fully aware of the gravity of ethnic tensions, he admitted that he never raised these sensitive political issues with his Rwandan counterparts in the framework of his mandate. As soon as violence flared up in April 1994, he returned to his capital, transmitted his files to other colleagues in charge of humanitarian and political affairs, and was then assigned to a similar position in another developing country. With hindsight, he rightly questioned: what is sound economic advice worth if the distributional and political consequences contribute to exacerbate hatred among different ethnic groups and to lead to such a dramatic outbreak of violence and destruction?

This exemplifies how much economic policy advisers and the international financial and development institutions they staff have been uneasy about getting involved in war-torn countries. This is worrying to the extent that armed conflicts have long been pointed out as both a major source and consequence of failed development. All major regions of the developing world have been plagued by civil wars or regional conflicts since the end of World War II, least developed countries being particularly affected. In war-prone settings, we contend that political stability cannot be relegated to a lower priority than – and should often prevail over – economic efficiency. For reconstruction activities are nullified if war starts anew, and efforts to restore confidence among investors and consumers cannot succeed without a minimal level of political stability. As we elaborate in this dissertation, advances over the last two decades in the fields of distributional analysis and political economy provide several tools to look into politico-economic interactions. Unfortunately, policy advisers widely neglected the political consequences of their economic recipes as they lacked both the will and the mandate to tackle the highly sensitive, yet crucial, interactions between the economic and political spheres in war-prone settings.

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1.1 OBJECTIVE AND STRUCTURE OF THE THESIS

The objective of this dissertation is to develop – and test in the framework of a case study on Guatemala – two complementary methodological approaches to integrate political and conflict-related factors in the economic analysis of war-torn countries.

- The first approach focuses on distributional analysis through a presentation of the social accounting framework and the decomposition of accounting multipliers (Pyatt and Round, 1979; Defourny and Thorbecke, 1984). We build a social accounting matrix (SAM) for Guatemala and calculate the transfer, open-loop and close-loop multipliers. Several simulations show the distributional impact of various fiscal reform options. Fiscal reform ranges among the key challenges in the direct aftermath of a civil war, as is the acute case in Guatemala. This results both from the necessity to pay for peace-related expenses as well as from the political and distributional issues at stake. SAMs further have the merit of providing a coherent framework to reconcile the sparse and inconsistent data characteristic of countries at war.

- In the second approach, we depart from traditional neo-classical economics and draw on recent political economy literature. Concretely, we elaborate on the analytical framework developed by Haggard, Lafay and Morrisson (1995) to assess the political feasibility of stabilisation programmes in developing countries. This methodological approach makes it possible to trace both the impact of economic reform on the behaviour of social groups and the effect of political instability on economic outcome and policy decisions. It also permits to assess the relations between public policy choices and the economy via the whole politico-economic cycle, including armed conflict. Based on this, we present a macroeconometric model and estimate its parameters with a set of quarterly political and economic indicators which we calculate for Guatemala. We then simulate the impact of economic conditionality on peace-building as well as the incidence of peace-related conditionality on economic policy.

This dissertation thus focuses on the typical dilemma of a war-torn country which has to deal simultaneously with the diverging requirements of

peace-building and economic reform, and shows that attempts to implement both agendas at the same time conflict with one another.

The originality of this doctoral research resides in its emphasis on the interactions between economic reform and peace-building, and the inclusion of political and conflict-related variables in economic modelling. More specifically, we first run simulations on a SAM-based model that directly relate to one of the Guatemalan peace accords: the introduction of a more progressive tax system. We combine our simulation outputs in terms of distributional analysis with a basic understanding of the dynamics underlying Guatemalan politics in order to identify policy reforms that are politically feasible or not. Second, we introduce into a macroeconometric model variables such as conflict intensity, political repression and peace-building conditionality to assess the interactions between the Guatemalan economy and polity throughout the peace process. We may add that econometric modelling has not been applied to war-torn countries before 1997-98. Since then, econometric testing has been used in the framework of cross-country studies while this doctoral research is the first attempt to do so in a specific country case study.

The dissertation is organised under three modules:

The first one looks at the economic literature on conflict and reconstruction, identifying strengths and weaknesses with a view to laying the ground for the following two modules. More specifically:

- the remainder of *chapter one* discusses methodological difficulties related to economic research on countries at war and postconflict rebuilding, and sets out the limitations of our methodological approaches in dealing with war-torn economies.

- The *second chapter* analyses the thrust of *peace economics*, which could also be referred to as the economics of war. It briefly looks into its main developments after World War II. We review the few empirical studies whose findings are grounded on econometric modelling and rigorous testing, studies which only emerged in the last two or three years. The chapter shows that research on developing economies at war has been chiefly limited to the interpretation of descriptive statistics. It further highlights that many essential contributions to understanding the dynamics underlying war-torn economies have been brought by non-economists. *Chapter two* also reviews relevant literature on economic policy challenges in the transition from war to peace. We conclude on

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the need to better integrate distributional and political issues in economic analysis on war-torn countries.

The second module focuses on distributional analysis and introduces the social accounting framework. In *chapter three*, we construct a social accounting matrix (SAM) for Guatemala from which we draw a linear multiplier model and decompose accounting multiplier effects. We then run simulation of various changes in government spending and taxation, and assess how they affect income distribution at the household level.

The *third module* deals with the study of politico-economic interactions during the fragile transition from war to peace:

- *The fourth chapter* outlines an analytical framework tailored for the study of politico-economic interactions. It focuses on the relationships between domestic and external actors, the government, economic and political events, and economic and political measures. The chapter elaborates on microeconomic considerations that underlie both this analytical framework and the macroeconometric model developed in chapter eight. Based on a government's political support function, we discuss how politico-economic interactions take shape and illustrate how and why the optimal policy-mix from the standpoint of government leaders diverges from the economic optimum advocated by the international financial institutions (IFIs), and how economic and political conditionality interact with domestic priorities.

- *Chapter five* dwells on Guatemala. Following a historico-analytical approach, we describe the Guatemalan economy and polity along the lines of the politico-economic framework outlined in chapter five. This chronological analysis of political and economic events and policy decisions serves as a basis for constructing the data sets that are needed to estimate our macroeconometric model (see chapter seven).

- *Chapter six* presents a politico-economic model and its application to Guatemala. Estimation issues are discussed before presenting and interpreting the model's outputs. Detailed explanations are provided on the quantitative and ordered qualitative variables entering the model, which require the construction of quarterly national accounts for Guatemala. The goodness of fit of our macroeconometric model is compared with the descriptive capacity of more traditional models that focus exclusively on economic variables. We then run simulations of

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different types of interventions by foreign actors and analyse their impact on the economic and political spheres. *Chapter seven* concludes.

I.1.1   Limitations of the Methodological Approach

A multitude of factors all coexist and interact simultaneously during the transition from war to peace, be they economic, political, military, cultural, psychological, religious, or other. These multifaceted interactions require extensive exchanges and mutual understanding among social scientists in different fields. The specific contribution of this doctoral research is limited to better integrating the political dimension into economic analysis and policy advice. This dissertation therefore does not address fundamental challenges facing war-torn societies such as the decentralisation of power, demobilisation and reintegration of former combatants, institutional reforms, etc.

While hints have been made as to their strengths and specific contributions, it is important to underline that the methodological approaches which we develop here cannot apply to all war-torn economies. For a certain number of conditions must be met – or specific hypotheses must hold – for the models to be applicable:

- SAMs correctly portray the interdependence between production and the primary and secondary distributions of income. But as for input-output analysis, SAMs remain fundamentally applicable in contexts which are characteristic of fixed-price models with excess production capacity and absence of substitution. Consequently, they cannot be applied to study shocks that involve important changes in the economic structure of a country, changes which are often associated with the destruction of the productive apparatus and infrastructure as a result of war, and/or with major shifts in relative prices characteristic of adjustments in developing countries.

- The limitations associated with the politico-economic model developed in chapter VII derive from the assumption of constant coefficients in the structural equations. The assumption that equation coefficients remain constant throughout the study period limits the model's application only to cases in which the war does not fundamentally alter the socio-political and economic structures. To the extent that a conflict inflicts severe physical damage to production facilities and the

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infrastructure of a country, coefficients would have to be adjusted accordingly to account for the ensuing structural changes.

Yet the tools developed in this dissertation remain basically valid for many of today's war-torn economies where the conflict did not result in substantial direct damage to the physical capital nor to the infrastructure. The assumption of constant coefficients thus holds for countries such as Guatemala where the sectoral composition of GDP did not change much during the conflict. In the Guatemalan case, it probably remained even more stable than what would have happened, had there been no civil war: the share of agriculture did not change much between 1979 and 1996, and still accounted for one fourth of GDP by the end of the conflict, while this share tended to decline in neighbouring countries at peace over the same period.

I.2 METHODOLOGICAL DIFFICULTIES

The study of contemporary war-torn countries poses major conceptual and methodological challenges which partly account for the paucity of solid, rigorous economic research on developing countries at war, as illustrated in the next chapter. The major methodological challenge often mentioned in the framework of traditional economic research is the difficulty of conducting empirical research because of an acute lack of reliable data on conflict-ridden economies (Stewart *et al.*, 1997). This may be due in part to the impossibility of collecting and processing data during hostilities, not to mention the weakness of the statistical system in many contemporary war-torn countries even before the conflict started. Another reason is that the release of accurate socioeconomic data may be regarded as counter-productive or even dangerous, in particular in countries where the distribution of income and assets is highly concentrated (e.g. Guatemala). Besides, the information available often fails to include the informal, illegal and criminal activities that tend to flourish during conflicts. In the case of the Horn of Africa, for instance, survival strategies have increased the share of subsistence agriculture in the overall economy, while growing informal or underground sectors have pushed a considerable portion of economic activities outside the scope of national accounts (Brown *et al.*, 1992). Kinshasa provides another typical example: GDP per capita stood slightly above USD 100 in 1998, according to official statistics, while

household surveys carried out in the city reported that the average annual expenditure per capita was around USD 260 that same year. In this context, the social accounting framework may represent an efficient tool to reconcile data from different sources in a consistent manner.

Even when accurate data is available, it is often impossible to distinguish socioeconomic changes that can be attributed solely to the war from effects caused simultaneously by other factors (e.g. changing international terms of trade). Counterfactual analysis might provide some assistance but is even more difficult to carry out than under normal circumstances. First, prewar economic conditions are often radically altered during the conflict. Second, comparison with similar countries at peace is questionable since differences in initial economic conditions may actually account for the emergence of a conflict in the war-torn country under analysis. Third, data deficiencies make economic modelling of war-affected countries very difficult, if not impossible in some cases.

The greatest challenge may yet lie elsewhere. During civil war as well as in its direct aftermath, politics tends to take precedence over economics. Questions such as how economic reform affects the structure and balance of power between the major social forces involved in reconstruction are crucial in understanding the rationale and behaviour of investors, consumers, landowners, peasants, urban workers, etc. We contend that economic policy advice to war-torn countries requires taking fully into account fundamental issues such as political stability and institutional capacity for peaceful conflict management. This requires the inclusion of political and conflict-relative information – most of the time qualitative data – in quantitative economic analysis, which makes the analysis more complicated.

Another difficulty relates to panel data for cross-country analysis. Economies at war do not lend themselves to simplistic generalisation, as each and every conflict-ridden country faces different challenges. Researchers have nonetheless attempted to find common features among countries at war, with a view to forecasting the likely effects of conflict on the economy, devising appropriate preventive responses and providing sound policy advice. Yet, there is no such thing as *a typology* for the analysis of conflict economies. The lines between situations of political violence, widespread criminality, civil disorder, and armed conflict have become blurred. As a result, scholars have selected and categorised war-torn countries according to different criteria (e.g. causes of conflict, kinds

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of actors involved, number of battle-related deaths, degree of state regression or collapse) depending on the purpose of their research, which makes cross-study comparison difficult[1].

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1   To give a few examples, Stewart *et al.* (1997) consider only conflicts in which more than 1,000 people died in a given year as a direct or indirect outcome of the fighting to assess the costs of war. In another study on war and development, Smith (1993) takes into account all conflicts having inflicted a cumulative number of casualties of several hundreds and in which more than 25 people were killed in a given year. Nafziger (1996) identifies countries with at least 2,000 war casualties in 1992-94 or at least 100,000 internally displaced persons in 1995 to analyse the economics of complex humanitarian emergencies.

II.   WAR AND PEACE ECONOMICS

II.1   PEACE ECONOMICS VERSUS TODAY'S WARS

Economists have studied the many facets of warfare for decades, often with the explicit objective of helping mitigate its effects, if not avoiding it altogether. During the Cold War, the "peace economists" were primarily concerned with issues linked to East-West confrontation, such as the strategic balance between the two superpowers, the arms race and arms control, the impact of defence expenditures, conflict management analysis, etc. Extensive use was made of game theory which was originally developed by Von Neumann and Morgenstern in 1944 to explain economic behaviour and to analyse conflicts and their resolution. Anderton and Isard (1992: 1-55) produced a concise survey of the main strands of thought in the literature on peace economics during the Cold War. The review highlights that economists focused on the following issues: standard resource allocation analysis and strategic behaviour (game framework); arms race models; analysis of military expenditure impact on macroeconomic stability (Keynesian and general equilibrium framework) and disaggregated (micro-) analysis of defence spending; impact of military outlays on investment, productivity and growth (endogenous growth); and political economic analysis (e.g. pressures from the military industrial complex on the governments).

Contemporary conflicts do not conform to traditional images of battlefields. Internal war has become the rule rather than the exception: all thirty of the major wars in 1995 were conflicts within a state and around 90% of the victims (casualties, wounded and displaced persons) were civilians (SIPRI, 1990). More than half of these conflicts have lasted for over a decade, often taking the form of intermittent warfare that erupted only from time to time. Today's conflicts obviously do not fit into the former conceptual framework of bipolar confrontation. Former peace economics is therefore of limited help in meeting the complex challenges facing contemporary war-torn societies. In a literature review on peace economics, Fischer and Schwartz (1992: 239) note that economists and development agencies generally considered civil war as an external event which is not amenable to economic analysis. The two authors add that war has been rather treated as "an event which disrupts from time to time more

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normal conditions under which economic laws apply." Economic research on conflict-ridden countries and postwar reconstruction has nonetheless intensified over the past few years under mounting demand from multilateral and bilateral development agencies. We will return to that issue later in this chapter.

As for the economic analysis of peace-building and reconstruction, much research has focused on the Marshall Plan, which still represents a milestone in the field of the economic rebuilding. However, most of the lessons drawn from rebuilding Europe after 1945 do not apply to contemporary postconflict countries. As Lake points out (1990: 10-17), there are probably more differences than similarities between the challenges of European recovery after 1945 and the plight of war-torn societies in the developing world at the end of the twentieth century. The author makes the following points:

- The challenge of developing economies is often to build basic infrastructure and create new capacities, whereas European countries had the remnants of an extensive physical infrastructure, as well as political and entrepreneurial traditions conducive to growth and stability. One might add to Lake's analysis that literature on contemporary conflicts reveals that the differences in agenda between donors and recipients are often larger today than they were between the United States and Europe after World War II – not to mention differences in cultural ties and values.

- The military victory of the Allied Forces was undisputed, and peace could be firmly restored, whereas the initial challenge facing many postconflict countries today consists in restoring a minimal level of security and stability.

- Although Europe itself accounted for 80% to 90% of the capital formation during the first two years of the Marshall Plan, the American contribution was immense, amounting to US $13.2. billion from 1948 to 1951 (equivalent to some 80 billion in 1996 US dollars), or 2.5% of the recipients' GDP. The repetition of such a large contribution seems unlikely in the context of budgetary constraints and diverging political agendas among donor countries. In addition, the ability of local governments and other domestic institutions to make the best use of foreign assistance is much smaller in low-income

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postwar countries nowadays, their absorptive capacity remaining sadly limited.

But other features of the Marshall Plan may commend themselves to contemporary planners of reconstruction programmes. Lake (1990) particularly stresses the necessity to rely on local planning and initiative, and the advantages of adopting a regional rather than national perspective to reconstruction. De Long and Eichengreen (1991) argue that the major contribution of the Marshall Plan to European recovery was not financial aid itself, but rather the conditions attached to it: aid was for instance granted provided recipient governments made a commitment to keep budget and inflation under control. In addition, the Marshall Plan strongly encouraged recipient governments to deregulate the postwar economy, promote regional integration and make greater reliance on market mechanisms[2]. De Long and Eichengreen nonetheless recognise that the Plan did play a major role in alleviating resource shortages. The massive inflow of financial aid facilitated the implementation of sound economic policies by reducing the costs of adjustment to be borne by competing distributional interests: "It did not obviate the need for sacrifice. But it increased the size of the pie available for division among interest groups." (p. 45).

Economic analysis of developing war-torn countries has been rather rare. In a seminal book on *The Industrialisation of Backward Areas*, Mandelbaum (1945) made one of the earliest studies desling with the reconstruction of nonindustrial countries, i.e. backward areas of eastern and south-eastern Europe "which were left virtually untouched by the vigorous industrial development of western Europe in the nineteenth and twentieth centuries". The author selected this region partly because information about conditions in this part of the world was slightly more plentiful than that dealing with other less advanced areas. However, only pre-World War II material was used and no account was taken of the changes in the region since 1939. Consequently, the book deals more with the process of industrialisation of backward pre-war economies than with the reconstruction of postconflict countries, even though this enquiry was part of a wider research project on problems of international reconstruction. The book by Bonné (1945) on *The Economic Development*

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2   The two authors note that conditionality was not necessarily felt as a constraint by the recipient European governments as the requirements imposed by the United States often matched their own objectives.

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of the Middle East is another early reference on postwar reconstruction in the developing world.

As for the international community, humanitarian and development circles initiated a vivid debate at the beginning of the 1990s to bring emergency relief, rehabilitation and development activities into a more effective and coherent framework (e.g. UNDP, 1994 and 1995). The donor community has been working on the formulation of policy orientations for development co-operation in conflict prevention and postconflict recovery under the Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD/DAC). In May 1997, the resulting guidelines were endorsed by DAC members at a High-Level Meeting in Paris (OECD, 1997). They provide valuable indications on recent, collective views of donor countries on how the international community should address issues such as conflict prevention, peace-building and postwar reconstruction. The same year, the Governing Board of the World Bank endorsed a policy paper for the Bank's involvement in postconflict reconstruction. A "Postconflict Unit" was established to respond to the needs of the Bank's operations in war-torn countries (World Bank, 1997a).

II.2 ECONOMIES AT WAR: THE DESCRIPTIVE APPROACH

A review of the recent literature on war-torn economies sheds light on the extreme paucity of rigorous economic modelling to date. The bulk of socioeconomic research into the causes and consequences of civil war is limited to reviewing and interpreting the statistical information available (cross-sectional statistical tables), without formal modelling nor rigorous testing. In other words, researchers have generally adopted a historical perspective to understand the evolution of – and interactions between – conflicts, peace-building and the economy. It was not until the mid-1990s that a few economists pioneered more rigorous research on the roots and impact of civil wars in developing economies.

Sections II.2 and III.3 concentrate on the more descriptive inputs of economists and other social scientists, while section III.4 provides an overview of these recent "scientific" advances in peace economics. Our purpose here is not to minimise the contributions brought by historical and

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narrative analyses. To the contrary, we argue that it is imperative to adopt a wide, multidisciplinary perspective to understand the multifaceted and complex challenges facing war-torn countries. The distinction between the "scientific" and "descriptive" approaches only serves the purpose of methodological clarity.

A few years before the modelling attempts reviewed in section III:3, economists initiated statistical research on contemporary war and the economy from the end of the Cold War onwards. Frances Stewart and Volpy FitzGerald in particular have pioneered research on war costs in developing countries as well as on the impact of conflict on war-torn economies. In the framework of a first cross-country statistical survey of this sort, Stewart et al. (1997) assess in particular the economic effects of war for some sixteen countries affected by major conflict in the 1970s and 1980s, in which over 0.5% of the population died as a direct or indirect result of war. Their survey is primarily based on the World Bank's *World Development Reports* and *World Tables*. Before turning to their findings, it should be kept in mind that statistical surveys of war-torn economies are as reliable as the data available. They generally neglect a substantial portion of economic activities such as informal exchanges, barter trade, consumption of own subsistence production, illegal economic activities, etc.

The cross-country survey by Stewart et al. confirms, as one would expect, that GDP growth rate and income per capita tend to be negatively affected by conflict. The authors conclude that even if the most visible effects of war hit the economy directly through damages to physical and social infrastructure, the indirect effects may have more dramatic implications for long-term development. More specifically, the social and cultural disintegration of war-torn societies has a dramatic impact on the economy: in the absence of minimal political stability, mutual trust, and respect for property and the rule of law, economic relations break down (see also Stewart, 1993). This in turn may have multiplier effects on the fall of domestic production and income. Thus, most human misery and deaths in poorer countries are not a result of direct violence, but of the more general effects of protracted conflict on economic and administrative structures, such as the collapse of basic public services, famine and large-scale forced migration.

II.2.1   Winners and Losers

Recent studies have shown that war typically spurs radical changes in the allocation of resources and activities among sectors and institutions (primary income distribution) as well as among households and social groups (secondary income distribution). As a result, a small minority of people often acquires a vested interest in the continuation of conflict ("winners"), while the vast majority slides towards, or below, the absolute poverty line ("losers"). This sub-section analyses the impact of war on living standards and assesses how war costs are distributed, i.e. who stands to win or to lose from the war.

Methodologically, Stewart et al. (1997) extend Amartya Sen's original concept of entitlements[3] to assess how living standards are affected by conflicts. The authors introduce the notions of *public entitlements* (goods and services provided by the state), *civil entitlements* (production and transfers arising from the community and NGO sources) and *non-legal acquisition or loss* of assets and incomes arising from the conflict. They argue that the breakdown of the formal private and public economy is one of the major causes of decline in market entitlements stricto sensu. Yet, this decline can be countered by alternative forms of public and civil entitlements provided by emerging social networks and the burgeoning informal economy, or by rebel groups and/or humanitarian agencies. The emergence of alternative forms of entitlements generates winners as well as losers. Some groups may acquire a vested interest in the continuation of conflict as they draw substantial profits out of quasi-rents created by market shortages, or out of illegal and predatory activities encouraged by widespread impunity and legal system breakdowns (FitzGerald and Stewart, 1997: 6).

The empirical results obtained by Stewart *et al.* (1997) confirm that war costs appear to be higher in cases of geographically pervasive conflicts where the government has lost its capacity to collect taxes and provide basic services. Where "quasi-government structures" were able to maintain core functions, these costs could be limited to a certain extent. The findings also show that international wars tend to have less harmful effects than internal conflicts, due especially to the fact that in the former case, the

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3 Entitlements as originally defined by Sen are legally-based claims of households to the goods and services supplied by the market or derived from their own production (Sen, 1992).

state usually strives to maintain basic social services throughout the country as part of its war effort.

Differing conditions in the nature of conflicts and of the countries in which they occur may explain why there are considerable differences between the consequences of wars. Stewart *et al.* (1997: 18-19) point to several factors that are positively correlated with the economic costs of war: (i) duration, magnitude and geographical spread of a conflict; (ii) imposition of a strict international trade embargo; (iii) public service and state collapse, and (iv) the lack of alternative support networks such as family, rebel forces or humanitarian agencies. The characteristics of the economy prevailing before the war also determine the extent of later war costs, particularly (i) the initial import dependence ratio; (ii) the level of subsistence production in the country; and (iii) how near the poverty line or survival limit people were situated in the first place.

Stewart (1993) insists that famine results mainly from entitlement failure, falling income and breakdown in the distribution system, rather than from a drop in aggregate food supply. Household *survival strategies* are associated with the spread of parallel and extra-legal activities which might themselves provoke further tensions and the transfer of assets or population (Duffield, 1994: 50-69). Coping strategies often rely on "job diversification", that is a shift of household members on the labour market to ensure maximal liquid income and entitlements. Access to public entitlement and security may require a given household to maintain some of its members in the public sector or join the armed forces, while other members may emigrate to richer countries and send remittances. To the extent that soldiers and security forces are not adequately remunerated by the state, they have an incentive to resort to systematic corruption and looting to improve their own situation. Another survival strategy for some household members is to rely more permanently on foreign assistance. The most profitable, but most risky, option is to engage in illegal activities. As a last resort, the most vulnerable groups may be forced to sell or pledge their subsistence and production assets such as land and livestock, or personal assets like jewellery, that other people ("winners") acquire at rock-bottom prices. Migration often remains the ultimate survival strategy (Stiefel, 1994: 16).

At the household level, FitzGerald (1997: 53) finds that the social group likely to be worst affected by war is the urban poor and landless, who have less access to informal quasi-rents and fall outside the official welfare net.

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It is then largely the poor who "pay for the war", especially if the increasing fiscal deficit is met by inflation rather than by an increase in taxation or external finance, as is often the case in conflict economies. Inflation may de facto help contain the real budget deficit by reducing the real wages paid by the government to public sector employees, but it severely affects their living standards. On the other hand, nominal revenues accruing from activities in the informal sector rise as prices increase. Therefore, households which enjoy wide access to quasi-rents resulting from supply shortages in the formal market are in a position to maintain entitlements, or even make substantial gains. But the growing number of petty traders in the urban informal sector benefit from rising demand for goods and services on parallel markets only to a limited extent as the labour supply rapidly increases in this sector and exacerbates competition. As for peasant farmers, they may benefit from higher food prices when selling their production but they also have to pay more for agricultural inputs. In short, FitzGerald (1997) concludes that the distributional effects of war on real income among households depend on internal terms of trade, consumption patterns, employment opportunities and real wages, as well as access to scarce resources.

Within households, war profoundly changes traditional gender relations as men are mobilised, wounded, or killed. Research on gender and conflict shows that women should not be seen only as war victims: they often acquire greater responsibilities and a more prominent role as household head and chief provider. Yet, it has been highlighted that households without male adults tend to be more vulnerable to loss of market and public entitlements such as food shortage or escalation in the prices of staple goods and basic services. For further reference on gender and postconflict rebuilding, see Sørensen, 1998.

II.2.2   Dynamics Underlying Civil War Economies

Statistical surveys on war economies and studies on survival strategies are useful contributions when coming to grips with peace-building and reconstruction strategies. However, one may argue that it is necessary to have a better understanding of the underlying dynamics of civil war economy in order to assess the politico-economic interactions at play in a civil war.

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Ownership and distributional issues often lie at the heart of conflict. Some analysts have recently suggested that contemporary conflicts can be better understood if considered as a logical outcome of the struggle between different social groups for access to – and control over – resources such as land and humanitarian aid as well as trading routes and activities (Keen, 1997). The objective of warring parties is not invariably to seize power and gain control over the state, but may also be more narrowly economic, as exemplified at certain stages in Liberia or Sierra Leone. Even if war is costly and seems irrational with regard to the society as a whole, it is a very profitable business for the particular groups who can secure control over resources and draw benefit from them (King, 1997). Leaders may have a direct personal interest in continuing the war as they are bound to lose power through negotiated peaceful settlement.

In their book on civil war economies, Jean and Rufin (1996) adopt an original approach to contemporary armed struggles by analysing how internal conflicts are financed. In order to understand today's complex humanitarian emergencies and the recent evolution of countries at war, the authors examine the ways that conflicts affect the structure and organisation of the economy. For them, the economic analysis of civil war represents one of the most promising approaches to building a new counterinsurgency theory, or a theory on civil war. They stress that in the aftermath of the Cold War, our conceptual framework must be updated to account for the increasing importance of local economies over foreign assistance, be it military and financial support or "humanitarian sanctuaries", i.e. refugee camps located in neighbouring countries.

As a result of falling foreign financial and military support, warring parties have to depend primarily on their own natural assets, i.e. exploiting and trading domestic resources such as tropical timber, rubber, mines, gems, as well as arms and drugs (see also Labrousse, 1996: 467-494). Consequently, fierce fighting takes place in and around strategic areas as opposing groups try to secure territorial control over key resources and trading routes. Rufin (1996: 53-55) argues that the increasing fragmentation of armed groups is mainly the result of heightened internal struggles among parties in conflict to exploit and market local resources. Countries at war are then plagued by a surge in economic criminality and predatory behaviour. Rufin adds that in an environment of extreme scarcity, humanitarian aid is another resource that has been subject to increasing attacks in recent years. The author also remarks that opposition groups have increasingly appealed to their diaspora established in richer

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countries for financial support (see also Angoustures and Pascal, 1996: 495-542).

All these issues are fundamental in a socio-political perspective, but should not be ignored by economists to the extent that they greatly contribute to understanding the dynamics at work in civil war economies and in rebuilding processes. Somewhat surprisingly, essential issues such as widespread criminalisation of the economy, the impact of international criminal networks, and the effects of competition for the control over resources and trading routes have been brought up by political scientists and humanitarian practitioners rather than by economists themselves. Analysts such as Jean and Rufin, for instance, are humanitarian practitioners who underlined such basic questions as the development of survival strategies in the midst of conflict, the role and impact of the booming informal sector, the issues of endemic corruption, etc. It is obviously difficult to include these variables in economic analysis. Although most economists tend to acknowledge the relevance of these factors in the rebuilding process, they tend to pay lip service rather than give them substantive attention, and serious attempts to integrate them into economic analysis and planning are still very limited. This may derive, among other things, from paradigmatic and methodological difficulties related to economic research on contemporary conflicts. Filling this gap requires pioneering work on relatively new ground.

II.3 ECONOMIC POLICY AND POSTWAR REBUILDING

During the fragile transition from war to peace, domestic authorities have to wrestle with competing demands from the international community through the economic and political conditions attached to external assistance. While economic conditionality often requires drastic cuts in government expenditure, political or peace-related conditionality implies increased public spending to cope with the pressing requirements of the peace agenda. On the one hand, economic stabilisation is required as flawed economic policies have often been followed prior to war, and macroeconomic imbalances tend to worsen during conflict. Some authors therefore argue that macroeconomic stability remains one of the most important elements of any economic rehabilitation endeavour (e.g. Kumar, 1997: 30). Other analysts contend that peace-building political stability should have priority over any other objective, as economic rebuilding

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efforts would be automatically impaired if war starts anew. For postwar states are in dire need of resources, among others to (i) rehabilitate the state apparatus, the security system and public services such as education and health; (ii) restore physical infrastructure and productive assets; (iii) reintegrate ex-combatants and returnees; and (iv) clear mines (for more details on the role of the state in rebuilding the economy see WSP, 1997a).

In this section, we review recent literature on the most crucial economic policy challenges facing governments during the transition from war to peace. For these policies involve substantial distributional shifts between socioeconomic groups that can spur renewed political violence.

II.3.1   Trade Policy

The empirical survey by Stewart et al. (1997) reveal that war conditions lead to a fall in *exports* as trade routes may be disrupted, and transportation means and infrastructure destroyed. As a result of decreasing export earnings, the *import* capacity falls unless net external finance increases to a greater extent than the fall in exports, which is most unlikely in the case of low-income countries at war. In a vicious circle, the drop in imported production inputs in turn reduces export capacity.

Official trade flows are affected by the fact that conflict disrupts traditional migratory and trading routes. On the other hand, unofficial cross-border trade tends to develop and sometimes becomes the main form of interregional trade activities in the aftermath of a conflict, as shown by McSpadden (1996) in the case of the Horn of Africa. Illegal trade tends to flourish as a combined consequence of increasing arms and drug trade and tight border controls or embargoes (e.g. Labrousse, 1996: 467-494; Kopp, 1996: 425-465). Once the conflict is over, illegal traders are likely to resist any attempt to reintegrate into the formal sector as they seek to maintain their profits. In addition, systematic customs corruption and an excessive administrative burden discourage formal trade. Customs administration thus deserves particular attention if trade is to serve as a catalyst for growth (WSP, 1997a: 8).

As for postconflict trade policy, conventional reform relies on trade liberalisation measures involving the reduction or removal of tariff and nontariff barriers and other anti-export bias. Commercial policy includes

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the set of measures that have direct implications for the domestic prices of importables and exportables. Border opening benefits export-oriented interests and harms import competing ones. Devaluation of the exchange rate affects the relative prices of tradables versus nontradables. The global effect on real wages depends on the combined share of tradables/nontradables and exportables/importables in the income and consumption pattern of a given household. As forcefully highlighted by Rodrik (1994), these measures may have a major impact on income distribution between social groups and production sectors. In a fragile peace process, this cannot be relegated to second-order priority[4].

Rodrik (1994: 61-88) presents a political cost-benefit ratio (PCBR) as a way to determine and illustrate the distributional impact of trade policy reform. The PCBR shows how many dollars of income are shuffled from one group to another for every dollar of net efficiency gain. When a policy is purely redistributive and achieves no net gain, the value of the index goes to infinity. When a policy increases some groups' income without taking income from any other group, i.e. is Pareto efficient, the index takes a value of zero. The income which is redistributed between socioeconomic groups corresponds to the political cost incurred by policy-makers. The political cost-benefit ratio can be written as:

$$PCBR = \frac{1}{2} \frac{\sum_i |\Delta income_i| - net\ gain}{net\ gain}$$

whereby the PCBR is the ratio of the political cost divided by the overall economic gain, as it divides the redistributed by the net efficiency gain accruing from the trade reform. The result is divided by two to correct the double counting of income variations which include both gains and losses. Rodrik calculates that the PCBR lies above 5, meaning that for each dollar of net income generated, 5 dollars are being reshuffled among different groups. Trade reform is thus politically costly. In addition, losers may be well known while potential winners do not know that they might gain from the reform, and are consequently not supportive of such reform. That is why the author argues that such reforms tend to be implemented only

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[4] Economic theory predicts that first-order effects affect primary or functional income distribution through changes in output levels, in relative prices of tradable versus nontradable and exportables versus importables, through job losses in previously protected sectors and job creation in emerging export sectors, etc. These changes in turn affect personal or household welfare depending upon how incomes are distributed by market institutions.

under specific circumstances which help reduce the overall costs for the politicians in power: trade reforms are often implemented together with drastic political changes (coups, new governments) or when they can be gradually introduced against the background of a long growth period (e.g. GATT rounds). Rodrik further contends that trade reform is easier to implement when combined with a stabilisation package in a crisis-ridden economy. For the stabilisation programme aims at curbing an acute economic crisis and should bring rapid improvement to the overall situation (e.g. price stabilisation).

One might add that in the case of trade agreements and stabilisation packages, governments are in a position to blame outsiders (GATT, IMF) for the negative impact of reform such as large redistribution of income among different groups. This tends to reduce the political cost incurred by the government because of a lower attributability factor (see Frey and Eichenberger, 1994). But it is important to underline that in the fragile transition from war to peace, the expected benefits of trade reform may be delayed for years because of the very low supply response and a general lack of investor confidence which characterise war-torn economies (see below). Even under normal circumstances, distributional effects tend to be felt immediately, whereas expected gains in competitiveness, output, and exports often take at least a year or two. The losers of trade reform may react violently and rekindle the conflict, especially if they are among the very groups who are bound to lose from peace as well.

In a study on trade policy and domestic political alignments based on the standard Stolper-Samuelson theorem, Rogowski (1989: 19-20) concludes that changes in exposure to trade profoundly affect internal political cleavages between capital, labour and land interests. He adds that appropriate and temporary compensations may help avoid a resurgence of violence. However, postconflict countries often lack the financial capacity to provide assistance to "losers" from trade reforms. The microeconomic impact of trade liberalisation should thus be carefully assessed in the context of war-to-peace transition.

II.3.2   Fiscal and Budgetary Policy

Statistical evidence confirms that during the war, *government revenue* generally falls in absolute terms as the fiscal base narrows and major

sources of revenue diminish. But government revenue does not invariably decrease as a proportion of GDP. This proportion even rose in a majority of cases studied by Stewart et al. (1997), with the notable exception of countries where government lost its tax collection capacity (e.g. Somalia, Afghanistan, Cambodia). *Government expenditure* on the other hand tends to rise as a proportion of GDP chiefly because of the war effort drain. As a consequence, *budget deficit* increases, as confirmed for all countries for which data is available. This may be aggravated by a collapse of public and private institutions accompanied by the diversion of skilled labour, which is either mobilised for the war or else flees abroad.

As far as the *sectoral allocation of government resources* is concerned, empirical surveys on war economies show that, as expected, the share of military expenditure tends to increase. More surprisingly, data gathered by Stewart et al. (1997) reveal that per capita expenditure on health and education was either sustained or rose in several countries where governments could maintain their capacity to deliver basic services – and raise taxes – in spite of the conflict. The share of investment in total public expenditure tends to fall in countries at war – and this to a greater extent than in other developing countries implementing expenditure-cutting measures under stabilisation policies.

A peace settlement reduces military expenditure ("peace dividend"), but increases spending for urgent reconstruction requirements and the restoration of health and education services. There is thus a pressing need to both raise government revenue and contain budget deficit. FitzGerald (1997: 54) argues that as the tax base is limited, governments may increasingly resort to indirect taxation (e.g. taxes on petrol and/or electricity, import duty on nonessential consumer goods) and user fees for public goods and services (e.g. transportation and health services). This option must be assessed on a case-by-case basis as it is often politically costly for the incumbent government, and may also revive inflation. Besides, indirect taxation may lead to a more regressive tax system and widen gaps between the rich and poor[5]. But it often represents the only short-term solution as increasing direct tax collection in the short run might not be realistic in postconflict countries often accustomed to major tax evasion and lacking efficient tax administration. Tax amnesty may help

[5] As a result of such concern about distribution, the Guatemalan Peace Accord requires that the tax system be "globally progressive", in addition to a 50% increase of the fiscal revenue/GDP coefficient (Minugua, 1996).

redress this situation together with efforts to strengthen and modernise administrative, auditing, and fiscal control capacities (Segovia, 1996b: 107-127).

II.3.3 Savings and Investment

As a result of falling income during the conflict, domestic *savings* are likely to decrease in absolute terms. The cross-country survey by Stewart et al. (1997) indicates that the gross domestic savings ratio also falls, in most cases. This decline may result from the necessity to maintain consumption levels in spite of reduced incomes, but may be balanced by a shortage of consumer goods leading to *de facto* forced savings, or else inflation in consumer good prices. FitzGerald (1997: 52) notes that the evolution of the ratio of savings to GDP may be ambiguous: uncertainty about life span might reduce incentive to save for higher immediate consumption, but on the other hand higher uncertainty linked with war conditions may increase precautionary savings.

Gupta (1990: 180-182) remarks that a reduction in savings generally will not result in an increase of consumption that would allow for an upward multiplier to take the economy to a higher level of prosperity under normal conditions. For uncertainty linked with political instability impairs many of the automatic, self-correcting and equilibrating market mechanisms. General lack of faith in economic prospects and institutions may lead to substantial "hoarding": individuals can either "store their money under the proverbial mattress (thereby withdraw money from the natural flow of economic activity), or they can send their money illegally (as few countries allow a free remittance of money abroad) to a safer haven, such as a Swiss bank, or to a politically stable nation." (Gupta: 1990: 181). Another option is to buy precious metals such as gold or silver. Consumption and savings tend then to decrease while the price of precious metals might increase.

Conventional wisdom would indicate that *private investment* falls as conflict breeds distrust and uncertainty. The ensuing higher risk and greater transaction costs discourage foreign and domestic investors. Political instability is likely to further cause an increase in *interest rates* which in turn reduces investment incentives. This upward trend in interest rates is due to the fact that hoarding lowers the amount of money available for lending. In addition, the higher level of uncertainty itself raises interest

rates. FitzGerald (1997: 50-51) adds that contrary to natural disaster, war not only damages the existing capital stock of firms, but also reduces desired stock level or investment plans. For expectations regarding profitability, domestic demand and export opportunities worsen as a result of prohibitive risks. The cross-country survey mentioned earlier clearly confirms that the absolute level of investment falls significantly in most cases. However, the negative impact of war on the ratio of investment to GDP appears less severe.

Because of the climate of instability, private agents may resort to other *investment choices* than fixed capital formation. In a study focusing on African civil wars, Collier and Gunning (1995: 233-237) underline that uncertainty leads to a portfolio shift from fixed to financial or liquid assets as real fixed assets become vulnerable to war damage. Some groups are thus likely to accumulate unusually high savings. As for portfolio decisions, there is a high premium on liquidity during the war. Probably the safest financial asset with the highest return is a foreign interest-bearing claim (e.g. bond or bank deposit), but access to transactions may be inconvenient as deposits and withdrawals must be conducted externally. This is not the case of transactions in foreign and domestic currency or with domestic interest-bearing assets. Available evidence for some African war-torn countries (e.g. Ethiopia, Mozambique, Uganda) indicates that portfolio choices of private agents result in an increase in liquidity in a range of foreign and domestic financial assets, depending on the penalty for holding domestic financial assets (i.e. inflation level, currency stability, availability of reliable financial services, etc.) as well as on the difficulty of conducting financial transactions abroad.

Gupta (1990: 194) remarks that, provided business and consumer confidence returns after hostilities, the saving and hoarding accumulated during the conflict may find their way back into the nation's income stream, as experienced by the Western World after World War II (analogous to the *real balance* or *Pigou* effect). But in the case of contemporary postconflict countries, macro-level instability added to the high level of criminality and political insecurity often discourages the acquisition of visible assets and perpetuates the premium on liquidity that emerged during the war. Potential *investors* tend to keep their assets in liquid forms despite the transition from war to peace. They usually adopt a wait-and-see attitude before switching from liquidity to domestic fixed investment (Collier and Gunning, 1995: 236), or they may be more tempted to acquire the consumption goods that they could not buy during

the conflict (FitzGerald, 1997). Alternatively, they may prefer to invest abroad or to keep foreign currency denominated financial assets, often in cash. Thus, private investment may not increase sufficiently to restore growth and employment due to uncertainty about future profits as well as about asset and land ownership, as discussed below.

To the extent that private agents do nonetheless switch from liquid to fixed assets, there are strong incentives to invest in quick-yielding, mobile assets such as transport equipment and light machinery as such investments can be easily redeployed elsewhere in case of renewed crisis. Consequently, economic agents are reluctant to invest money where it would be most needed, i.e. in fixed, productive assets such as agricultural infrastructure. The reluctance of investors to do so at the end of a protracted conflict is primarily responsible for the lack of supply response that orthodox economic reforms are expected to spur. Crosby (1990: 22) therefore argues that a major priority is to restore local investor confidence, which requires that a whole range of conditions be quickly met. Among them, Crosby mentions political and macroeconomic stability, the restoration of the rule of law, access to credit at reasonable rates, low or predictable levels of inflation, a convertible currency, a clear regulatory framework and access to market information and efficient trade-related services.

Private investment in agricultural production remains low in the aftermath of a protracted conflict, as it is often perceived as being too risky. Yet investment in agriculture production should be treated as a priority since increased food production reduces the dependency on foreign aid that developed during the conflict and helps restore market entitlements. Agriculture often represents the dominant export activity and is a major source of foreign exchange and government revenue. Agricultural development can further facilitate the reintegration of ex-combatants and civilian returnees in rural areas (WSP, 1997a: 8). Under normal circumstances, the agricultural sector is meant to benefit from conventional economic reforms aimed at removing anti-agricultural bias and promoting nontraditional agricultural exports. But FitzGerald (1997: 60) underlines that in the case of war-torn countries, farm price deregulation does not necessarily increase peasant output unless (i) credit and transport conditions are improved; (ii) the question of land ownership is appropriately settled; and (iii) farmers can spend their harvest earnings on producer goods such as fertilisers or agricultural machinery.

The state may have an essential role in providing the right incentives as public investment in the agricultural sector can help attract private investors (crowding-in effect). Collier and Gunning (1995: 239) suggest that a possible strategy for the government is to make the necessary investment in nontradable capital and lease it to private entrepreneurs on short, but renewable, tenure, or else to subsidise the act of commitment of private investors in irreversible agricultural assets. But while the former option makes private agents vulnerable to the government that becomes landlord, the latter might lead to corruption rather than judiciously "backing winners" through subsidies.

II.4 ECONOMIC MODELS OF CONTEMPORARY WARS

The emergence of more rigorous studies was made possible by the availability of new and more systematic data on war, in particular the data set of Singer and Small (1994) on civil wars between 1816 and 1992. This data set allows for the combination of standard economic data (e.g. Penn World Tables, World Bank statistics) with a standard source on civil wars. The latter are defined along specific criteria. They comprise all internal conflicts that resulted in at least 1,000 battle-related deaths per year, combatants and civilians included. To distinguish genuine war situations from massacres, pogroms and purges, Singer and Small specify that the weaker forces must cause to the stronger ones at least 5% of the number of fatalities they incur. The government must further be a party to the conflict. The Singer and Small data set gives the dates of the starting and ending of all civil wars since 1816 by month. Because socioeconomic data (e.g. income per capita) are not available for all war-torn countries prior to 1960, empirical studies focus on the last three decades.

II.4.1 Econometric Analysis of War Causes

A broad consensus prevails among scholars that postconflict reconstruction cannot succeed unless the root causes of war are correctly understood and eliminated, at least in part. Effective research on war causes has also been singled out as a prerequisite for the selection of early

warning signals and the design of successful conflict prevention policies. This has led a few economists to investigate with different models whether civil wars have economic causes, and how these interact with other variables. In what follows, we briefly describe the methodology and main findings of such pioneering work (Collier and Hoeffler, 1998; Auvinen and Nafziger, 1999).

Drawing on previous work by Grossman (1995) and Azam (1995), the models used are based on utility theory in that people rebel only if the expected benefits outweigh the costs of rebellion. Pooled cross-country time-series regression techniques are applied to a sample of developing countries which did or did not experience a civil war over the past 30 years. Several econometric methods have been applied to test the robustness of the findings, including ordinary least squares (OLS), generalized least squares (GLS), two-staged least squares (2SLS), tobit and probit models.

Collier and Hoeffler (1998) investigated for the first time into the economic causes of civil war. In their model, the benefits of rebellion are an increasing function of $p(T) \cdot T$ and P, where p is the probability of rebel victory, which diminishes in the per capita taxable base of the economy, T. P stands for the size of the population and is meant to capture the desire for secession. Turning to the costs of rebellion, the probability of war diminishes in both the expected duration of war (D) and the income per capita of the population (Y). Rebels further face co-ordination costs which can be assimilated to transaction costs. Formally, the authors set out the rebel decision on whether to embark on civil war as hanging on the rebel utility function which they specify as:

$$U_w = \int_{t=D}^{\infty} \frac{p(T) \bullet G(T,P)}{(1+r)^t} dt - \int_{t=0}^{t=D} \frac{(f(Y)+C)}{(1+r)^t} dt$$

where Uw is the rebel utility to engage in a civil war, G = gain conditional upon victory, C = coordination costs, and r = the discount rate. For a complete development of the model, see Collier and Hoeffler (1998: 565-567).

To summarise, the probability of civil war is a function of the gains from rebellion, made up of the probability of a rebel's victory and the expected gains from it (taxable base), and the cost of rebellion measured in terms of opportunity costs (income rebels have to forego) and co-ordination costs.

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Four proxies are determined for these variables: per capita income for the opportunity cost, share of primary exports in GDP for natural resource endowment (i.e. taxable base), population size and ethno-linguistic fractionalisation for co-ordination costs. The dependent variables are the occurrence and duration of civil war. The authors use probit and tobit regressions to investigate whether the explanatory variables are powerful in predicting civil wars, using a sample of 98 countries – of which 27 experienced civil wars – over the period 1965-92. The results show that income per capita is a significant and strong determinant of the two endogenous variables because of higher opportunity costs at higher income levels. The effect of natural resource endowment is nonmonotonic in that the risk of war increases at low levels and decreases at high levels. The authors interpret this as follows: at relatively low levels, increased natural resources constitute an attraction for the rebels as this bears the promise of a higher taxable base of the economy. At high levels, natural resources enhance the financial capacity of the state which translates into improved ability for the ruling elite to stay in power. The findings confirm that a large population increases the attraction of secession, although one could argue that the larger the population, the higher the probability of that country having a civil war to the extent that the main criterion applied by Singer and Small (1994) is to witness more than 1,000 casualties in a given year. Endogeneity problems should also be considered, for instance with regard to national income.

Auvinen and Nafziger (1999) conducted another study on the sources of so-called "complex humanitarian emergencies" (CHE)[3]. The authors posit that stagnation and decline of income, high inequality, a large share of military expenditures in GNP, falling real aid, a tradition of violent conflict, and low IMF credits as a percentage of GNP all contribute to the emergence of CHEs, i.e. are all positively correlated with complex humanitarian emergencies. While some of these assumptions simply derive from common sense, others are grounded on previous work. With cross-country statistical information for over 70 countries in the 1980s, Nafziger (1996) supported four initial hypotheses for the economic causes of humanitarian disasters:

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[3] Following Väyrynen (1996), the authors define complex humanitarian emergencies (CHEs) as human-made crises in which large numbers of people die and suffer from war, physical violence, or displacement. CHEs are usually accompanied by widespread disease and hunger.

1. *Stagnation and protracted decline in incomes* (real GDP per capita), caused by international economic shocks and deterioration, and/or a failure of agricultural development. One should further add among potential causes of stagnation leading to humanitarian crises bad economic policy and predatory practices by the state.

2. *Unequal and immiserising growth,* resulting from various factors such as exogenous market driven trends, government policies, regional and ethnic economic competition, or regional conflict and lack of economic integration. In addition, growing regional inequality and limited regional economic integration, often found in economic enclaves, can exacerbate ethnic and regional competition and conflict. Lack of regional economic integration not only increases the transaction costs of inter-regional trade flows, investment, and migrants, but also reduces the extent to which major social forces in the regions have a vested interest in remaining politically integrated with other regions (see also Schiff and Winters, 1997).

3. *Rapid population growth during substantial environmental degradation.* Of particular importance is the access to land (land tenure, land reform and redistribution, and access to water for drinking and irrigation). Population growth, insecure land tenure and environmental degradation can lead to conflict by reducing economic performance or necessitating the sharing of scarce resources.

4. *Large and abrupt shifts in income and wealth distribution during adjustment and liberalisation programmes.* Structural adjustment programmes redistribute the timing and extent of costs and benefits among economic actors. Most expenditure-reducing policies and some expenditure-switching policies tend to impose immediate welfare costs, while benefits emerge only after one or two years. This shapes the costs and benefits of adjustment to classes, regions, and communities and their perceived grievances.

Auvinen and Nafziger (1999) include in their definition of CHEs a measure of the number of refugees by origin adjusted for the source country's population. Thus, in addition to the "Correlates of War" database of Singer and Small (1994), the basic data is drawn from the *World Refugee Survey* of the US Committee for Refugees from 1980 to 1996. In operalising the dependent variable (CHEs), the author further constructed a composite indicator that includes malnutrition and disease. As for the

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explanatory variables, annual real GDP growth and GNP per capita are indicators of short-term changes and levels of income, respectively. Food and agricultural development is measured by the annual growth of food production per capita while changes and levels of per capital official development assistance (ODA) and terms of trade indicate sudden external shocks and long-term developments in a country's international economic position. The usual Gini index of income concentration measures income inequality. The use of IMF credit as a percentage of GNP provides an indicator of the extent of the IMF's intervention in a country. Finally, the tradition of violent conflict is measured by the number of deaths from domestic violence between 1963 and 1977.

The CHE function can thus be written as follows:

CHE=f(GDPGRO; GINI; GNPCAP; IMFGNP; CPIDIFF; MILCENT; DEATRAD, FOODGRO; ODAPOP80; ODAPOGRO; POLRI, TOT80, TOTCHANG)

where *GDPGRO*=gross domestic product (average annual growth, %); *Gini*=Gini Index; *GNPCAP*=gross national product per capita; *IMFGNP*=use of IMF credit as a percentage of GNP; *CPIDIFF*=consumer price index, annual change; *MILCENT*="Military centrality": annual military expenditures as a percentage of GNP; *DEATRAD*="death tradition": number of deaths from political violence; *FOODGRO*=annual growth of food production per capita; *ODAPOP80*=official development assistance per capita; *ODAPOGRO*=official development assistance per capital growth; *POLRI*=summary index of political rights grievances, i.e. demands for greater political rights other than autonomy; *TOT80*=terms of trade index; and *TOTCHANG*=terms of trade index, annual change (see Nafziger and Auvinen, 1997: 74-75).

Auvinen and Nafziger test the hypothesised sources of conflict mentioned above with a data set drawn from 124 developing countries for the period 1980-1995, using pooled cross-national time-series regression techniques. Simple correlation analysis indicates a direct and significant association (at the 1% level) of the dependent variable with inflation, conflict tradition and military expenditure while the association is inverse with food production growth, GDP growth and GNP per capita. ODA and the terms of trade are however not associated with the dependent variable. The robustness of the finding is tested with the following models in addition to the basic OLS: 2SLS each time two-way causality is suspected between the predictors and the dependent variable, GLS with the Prais-Winsten transformation because of autocorrelated disturbances within the cross-

sectional units, tobit and probit models. As the assumption of constant coefficients is unrealistic in a pool containing as much as 124 different types of cross-sectional units, the authors further specified fixed-effects and random-effects regression models[6]. Different lag structures were also applied to increase the validity of the findings. Most of the hypotheses are supported by the results of OLS linear regression analysis. However, some unexpected results are worth mentioning:

- Inflation appears to be a source of CHEs even if real economic growth adjusts for inflation and the distributional aspects of inflation were expected to be captured in income inequality. One possible explanation resides in the relative invariability of the data on income distribution because of infrequent surveys resulting in no change in the Gini coefficient of many countries between 1980 and 1995. Yearly inflation figures may thus capture the destabilising effect of income distribution shifts as inflation redistributes income from low-income workers and those on fixed income to high-income groups, at least in the early stages. Economists such as Alesina and Drazen have provided an interesting political perspective on inflation. These authors explain why there is a surge in inflation when stabilisation measures are delayed as different social groups compete to avoid bearing the cost of reform (Alesina and Drazen, 1989).

- The lack of data also partly explains that changes in the terms of trade are not associated with the dependent variable. GDP growth may capture some of the variations between terms of trade and CHEs.

After correcting for first-order antocorrelation, IMF funding is no longer associated with complex emergencies. The authors argue that it may reflect IMF's rejection of countries plagued by wars and humanitarian catastrophe. We would argue that this rather reflects the fact that a government fighting a war to survive is inclined to give absolute priority to political considerations and the war effort. As a result, it generally misses the stringent fiscal and monetary targets set under IMF programmes, which

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[6] As Auvinen and Nafziger (1999: 277-278) specify, "the fixed effects or least squares dummy variable model captures variation unique to cross sections in an intercept that varies from one cross section to another. In contrast to the fixed-effects model, the random effects or error component model assumes that the magnitude and the direction of the relationships among the cross sections are random but captured and specified in the error term explicitly. As in the OLS model, a single intercept is again postulated, but the differential intercepts are merged within the error term."

in turn leads to the withdrawal of the Fund's support. This causal relationship clearly appears when estimating the two-staged least squares model to correct for the potential simultaneous equations bias. A two-way causal relationship also appears between GDP growth and CHEs although the relationship is stronger from GDP growth to emergencies than vice versa when applying different lag structures on the OLS and GLS models. The same applies to the relationship between inflation and CHEs whereby humanitarian emergencies may give rise to inflation rather than vice-versa. There is also a two-way relationship between CHEs and military expenditures as the latter tend to rise during conflicts but are also conducive to *coups d'état* and violent conflict.

The obvious problem of simultaneity between the political and economic variables in cross-section data calls for particular efforts to discover important causal relationships. The robustness of the results presented above raises some questions since the reduced form model by Auvinen and Nafziger (1999) comprises a high number of explanatory variables. This tends to dilute the results, which is not the case for the structural form model presented by Collier and Hoeffler (1998). Running sensitivity tests by varying the set of additional explanatory variables would increase the confidence that the result's significance does not depend on the particular specifications chosen.

This being said, the findings of Auvinen and Nafziger (1999) do not fundamentally contradict with the conclusions of Collier and Hoeffler (1998). Yet, they provide empirical evidence that other exogenous variables not considered by the latter are also powerful explanatory factors of civil wars. Highlighting successful explanatory variables for the emergence of civil war obviously rely on the initial assumptions and objectives of the researchers. This calls for further research to identify empirical regularities in the relationship between economic policy, growth and conflicts. The updated data set of Small and Singer (1994) provides a basis to harmonise the countries and periods under examination to allow for direct cross-country comparisons.

Research conducted so far makes it clear that a single factor can rarely be identified as the sole root cause of conflict. It should be reminded that economic variables only provide a limited and partial picture of the rationale for war, even though they may still represent an important factor contributing to the violent outburst of a conflict. Social scientists have stressed that sources of conflict are many and various, and that

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understanding their subtle interactions requires a broad, multidisciplinary perspective[7]. We would like to stress here the conclusions of Stavenhagen (1996) drawn from a wide-ranging study on ethnic conflict and the nation-state: economic factors do play a crucial role in the generation of ethnic conflicts. Yet these factors must be combined with tribal, religious or ethnic enmities that are often invented by the contending parties to justify or legitimise violence (see also Alesina et al., 1997). "When regional and social disparities in the distribution of economic resources also reflect differences between identified ethnic groups, then conflict over social and economic issues readily turns into ethnic conflict" (p. 294). Psychological theories of collective violence, and the theory of relative deprivation in particular (e.g. Gurr, 1970) are useful contributions to address the interactions between economic and noneconomic explanatory variables of conflict. Easterly and Levine (1997) bring further insights on the influence of ethnic division on economic growth. The two economists argue that Africa's high ethnic fragmentation explains a significant part of the characteristics associated with low economic growth, such as political instability, high government deficits and insufficient infrastructure.

II.4.2   Econometric Analysis of War Consequences

As illustrated in sections II.2 and III.3 above, the economic consequences of civil war have been initially studied through statistical surveys which focus both on the macro level (national accounts, sectoral output) and on the micro level (distributional impact between and within households). Attempts to model the effects of armed conflicts were nonexistent until very recently. In a pioneering work, Collier (1999) develops a model of the economic effects of civil war and economic growth in the postwar period. No previous author had quantified the growth effects of civil wars and their aftermath, although several economists had examined the relationship between political violence in general and growth.

Since the mid-1980s, there has indeed been a renewed interest in political sources of economic growth and a boom in empirical research in the form of cross-country growth analysis. Political variables have been tested in

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[7] See for instance Van de Goor et al. (1996: 1-28) who assess different root causes of war such as historical circumstances, nationalism and ethnicity, religion, state formation and state collapse, competition over resources, democratisation, institutional weakness and armament.

growth regressions, and a very heterogeneous set of variables has been suggested to measure economically relevant differences in the political system of countries. These studies typically regress the average growth rate for a cross section of countries on selected political variables while checking for other determinants of economic growth identified in the empirical literature on economic growth. At the methodological level, there are two major methodological problems related to cross-section regression surveys (Brunetti, 1997). First, there is a problem of "simultaneity" as the usual ordinary least square (OLS) regressions used in most empirical studies do not reveal the direction of causation. Authors generally assume that the political process determines the growth rate, but some theoretical arguments indicate that the direction of causation could be the other way round. The second problem relates to the robustness of the econometric results to variations in the specification of the growth equation. This problem is particularly acute in empirical research on growth as the latter has been hypothesised to be related to a high number of variables. It has been suggested that empirical analyses should therefore provide formal sensitivity tests of the explanatory variable under consideration by modifying the set of additional right-hand variables. This would provide more confidence that the significance of the result does not depend on the initial specifications.

Psychological perception of inequalities appears to offer better explanatory variables of political variables than strict quantitative indicators, as revealed in a systematic overview of the literature on political variables used in cross-country growth analysis (Brunetti, 1997). This author reviews empirical links between economic growth and five categories of relevant political variables, namely democracy, government stability, political violence, policy volatility, and subjective perception of politics. Brunetti concludes that measures of democracy are least successful as explanatory variables in cross-country growth regressions, whereas measures of policy volatility and subjective perception of politics are most successful. The best criteria do not reflect any objective measure of political stability but are based on the subjective perception of the agents that make the growth-relevant decisions. This kind of "subjective" or "psychological" variables seem to exert a significant impact on economic growth, but have just begun to be taken into account in cross-country studies.

Coming back to the economic consequences of civil war per se, Knight et al. (1996) quantify peace dividend in an empirical study on 79 countries. In

their panel regression of the ratio of investment to GDP, warfare is found to have a strongly negative effect. When controlling for physical and human capital, together with military spending and trade policy, war loses significance in the growth regression. This means that civil wars reduce growth mainly by depleting the domestic capital stock in its various forms. Knight et al. further find that increased military expenditure has significant negative growth effects. Consequently, the single source of the peace dividend in their study resides in the reduction in military expenditure following the successful settlement of a conflict. De Melo et al. (1996) investigate the effect of civil wars in the transition economies of eastern Europe on the average growth rate over the period 1989-1994. The dummy variable "regional tension" in the growth regression is found to be highly significant and reduces the annual average growth rate by 9% over the whole period. The above dummy includes persistent internal conflicts or conflict-related blockades.

Building on these previous findings, Collier (1999) explicitly quantifies the effects of civil war on growth both during the war and during the first five postwar years. The author combines the data set of Small and Singer (1994) with the Penn World Tables and obtains a sample of 92 countries of which 19 had civil wars over the period 1960-1989. Collier distinguishes five central economic effects of war: (i) *destruction* (of physical capital, human capital, resources, infrastructure, etc.); (ii) *disruption* (insecurity, breakdown of social order) which reduces the efficiency of public expenditure; (iii) *diversion* (e.g. of public expenditure from output-enhancing to military activities; see Knight et. al. above); (iv) *dissaving* to the extent that income losses are regarded as temporary; and (v) *portfolio substitution* whereby private agents gradually shift their assets out of the country (including financial, physical and human assets). The central argument of Collier is that the portfolio substitution effect may be felt long after the end of hostilities[8]. Following this assumption, the restoration of peace does not necessarily produce a dividend. Downward adjustment of the capital stock during the war is a slow process. In the aftermath of a war, the desired capital stock is lower than had there been no war, although higher than that desired during the war. In the case of a brief war, the desired postconflict capital stock may be still below the prevailing stock capital at the end of the war. In this case, the decline in the stock of capital

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[8] This assumption is not negligible if one considers that around 40% of the total wealth owned by Africans is held in foreign assets.

will continue because of continued capital substitution, yielding a war "overhang" effect instead of a peace dividend. The explanation is found in the greater risk of renewed war perceived by economic agents – which is a rational expectation according to the findings of Collier and Hoeffler presented above – as well as in the higher burden of military expenditure that prevails in the direct aftermath of a short conflict. The author insists on the fact that the exodus of factor endowments is a gradual process and varies according to the types of capital: liquid assets are obviously highly responsive (endogenous) to war while the supplies of buildings, land and unskilled labour are less responsive (exogenous). There is thus a critical duration of civil wars, below which growth is lower in the postwar period than in the counterfactual case (no war in the first place) and above which there is a peace dividend.

Collier characterises prewar aggregate output in the simple Cobb-Douglas form where N denotes endogenous factor endowment and X those which are exogenous:

$$Q = a \cdot X^b N^{1-b}$$

As Collier specifies (1999: 170), "the rate of return on the endogenous factor will be its marginal product minus its rate of depreciation, d. An initial equilibrium is assumed in which the rate of return equals the return, r, obtainable on foreign assets, so that

$$(1-b)N^{-b} \cdot aX^b - d = r$$

Civil war reduces the rate of return on the domestic asset relative to that on the foreign asset. Both the disruption and diversion effects reduce factor productivity while destruction can be interpreted as an increase in the rate of depreciation. Civil war adds uncertainty with respect to the return on domestic assets, which creates a premium upon holding assets in liquid form, which can be easily transferred and held abroad.

Collier uses OLS and tests the results against fixed and random effects models. Civil war is introduced into the regression with three variables to capture the effects both during the war and in the first five years of subsequent peace: months of warfare, number of potential recovery months and a third variable which is a combination of the first two. The findings confirm the initial assumptions. The output indicates that the growth rate is reduced annually by 2.2% during civil war. During the five years following

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a conflict which only lasted one year, the growth rate would be 2.1% lower than had the war not happened. By contrast, the postwar growth rate is enhanced by 5.9% annually after a 15-year war. The OLS model is not rejected when tested against the fixed and random effects models.

Collier also addresses the effects of civil war on the composition of GDP as sectors may differ both with respect to the disruption and the diversion effects depending on their intensities in endogenous and exogenous factors. But since data is particularly weak for civil war economies, these compositional effects cannot be tested with a set of comparable cross-country data set. Instead of multicountry panels, Collier analyses data on a single country, Uganda, and reports the evolution of GDP composition from 1971 to 1994. The findings thus fall well short of a rigorous test, but nonetheless tend to reinforce the initial assumptions made by Collier. Activities with any of the following characteristics tend to contract during the war: activities which are either capital or transaction-intensive, and those which supply either capital or transactions. These include construction, transport, distribution, finance and capital-intensive manufacturing, whose share in GDP contracted from 42.5% to 28.7%. The inverse holds for low transaction, low asset intensity activities captured by arable subsistence agriculture: its share in GDP rose from 20.5% to 36% at the end of the war in 1986, decreasing to 32.1% in 1994. This means that the war-invulnerable activity nearly doubled as a share of GDP during the war whereas it would have been expected to contract, had there been no war. As one could expect, peace reverses the compositional changes caused by prolonged civil war.

Some of the findings above may appear somehow trivial in that they simply confirm what common sense dictstes: a country impoverished by decades of civil wars tends to have an enhanced postwar growth (or recovery) rate by mere virtue of its extreme poverty. Cotlier's study nonetheless provide solid evidence of key issues that had been overlooked in the past, such as the gradual process of capital loss that accrues from higher risk, increased uncertainty and disrupted social capital. This results in increased transaction costs, the substitution of portfolios abroad and dissaving. Another conclusion is that these factors may extend for years into the postconflict period. Based on these findings, we would argue that the restoration of social capital, interpersonal trust and confidence among economic agents should be given absolute priority in the formulation of reconstruction strategies. Otherwise, the adverse effect of portfolio substitution on domestic growth in the aftermath of a conflict, if left

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unchecked, might jeopardise the fragile peace-building process. A crucial challenge lies in finding a convincing approach to account for social capital in economic analysis, and to generate it through public policy (Fukuyama, 2001).

II.5 SUGGESTIONS FOR FUTURE RESEARCH

The literature review confirms that the distributional impact of economic reform plays a critical role in the firm restoration of peace. Yet this dimension has often been overlooked in economic policy advice to war-torn countries. The distributional impact of economic policy options should be systematically assessed to help identify potential winners and losers from peace and economic reforms, and design alternative policies or compensatory measures as appropriate. The following chapter builds on that suggestion and examines the potential contribution of the social accounting framework in the case of Guatemala. `

The literature review also highlights that interactions between the economic and political spheres may often shape the success of failure of a peace-building process. Research should thus help · improve our understanding of these politico-economic interactions. In chapters four to seven, we present a politico-economic framework which focuses on the behaviour of – and interactions between – the main actors involved in economic reforms and peace-building.

III. DISTRIBUTIONAL ANALYSIS

Unequal income and asset distribution has been recognised as an important source of violent conflict (see chapter II). Poverty and high inequality may often constitute necessary preconditions for the (re)emergence of conflict, but are generally not sufficient to translate into political violence unless combined with some form of group identity that can be mobilised for collective action. Distributional issues are also crucial in the postwar period as reconstruction and peace-building often entail substantial shifts in the distribution of wealth and power. Experts have increasingly called upon the international community to put distributional concerns at the heart of rebuilding strategies. A correct understanding of distributional impact is essential to economic reforms. Indeed, structural adjustment may have major destabilising effects as the living conditions of the poor and of politically vocal groups rapidly deteriorate, and longer-term costs and benefits of reforms are redistributed among different economic sectors and classes. Thus, reforms should not be considered only in their narrow economic aspects, but must be analysed from a political-economy point of view, as forcefully argued by Boyce and Pastor (1997).

The social accounting framework has been developed – and extensively used – for income distribution analysis. It offers a coherent framework in which to reconcile sparse economic data on war-torn economies. It further makes it possible to focus on distributional issues. This chapter starts with a short presentation of the social accounting matrix (SAM) framework. We then construct a social accounting matrix for Guatemala whose base year is 1986 (beginning of the peace process). The SAM thus captures the Guatemalan economy at the beginning of the peace process, which lasted over ten years. As detailed in chapter VI, Guatemala has been torn apart by more than thirty years of political violence, and it is estimated that over 100,000 people died in the civil war.

Based on the SAM, we analyse the structure of the Guatemalan economy in terms of sectoral contribution to total supply and demand, and secondary distribution of value added from production factors to household groups. We then specify endogenous and exogenous accounts and calculate

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multipliers which capture the transfer, open-loop and close-loop effects resulting from an exogenous injection. With this multiplier model, we run simulations of various exogenous shocks in the tax accounts and assess their distributional impact. This is because tax reform has been singled out as the major economic policy challenge in post-conflict Guatemala. The first simulations focus on an increase in government spending while the following three deal with changes between and among direct and indirect taxes, changes which are initially budget-neutral. Finally, we discuss the contributions and limitations of the SAM framework.

III.1   A SOCIAL ACCOUNTING FRAMEWORK

The study by Pyatt and Thorbecke published in 1976 under the title *Planning Techniques for a Better Future* is generally considered as the first comprehensive description of the social accounting matrix framework. SAM arose from a growing dissatisfaction with the existing practice of national accounting with its exclusive emphasis on measuring economic growth (Keuning and de Ruijter, 1988). A SAM can be defined as a numerical representation of the circular flow of income within the economy with emphasis on distributive aspects. Transactions in a particular year appear in a matrix format, showing receipts on the rows and outlays in the columns. Social accounting matrices (SAMs) have been extensively used for income distribution analysis (e.g. Defourny and Thorbecke, 1984; Pyatt and Round, 1985; Alarcon and Immink, 1993; De Janvry and Sadoulet, 1995).

The SAM is a simple and efficient framework in which to organise economic data in a consistent and comprehensive way. The system is consistent in that for every income there should be a corresponding outlay; and comprehensive in the sense that both the receiver and the sender of every transaction is identified. The SAM is an extension of the matrix of inter-industry flows, or the "input-output" table in which the payments or expenditures are listed in columns and the receipts in rows (for a presentation of the SAM framework, see King, 1981; de Janvry and Sadoulet, 1995). The inclusion of different types of households in SAMs distinguishes the approach from standard close-loop Leontief systems and makes it possible to bring the distribution of income into the picture. Including factor and household accounts implies an extension of the structure of accounting balances as set out by Quesnay (1758) and the

previous close-loop multiplier formulations which have been developed within his accounting framework (see also Stone, 1978). As underlined by Pyatt and Round (1979), the distinguishing feature is that value added in different production activities is paid directly to households of various types in Quesnay's *Tableau* as opposed to being routed to them via a set of factor accounts in the SAM framework.

SAMs make it possible to maintain accounting consistency between the patterns of production, the institutional and household distributions of income, and the patterns of consumption. Statistical data from different sources and information from diverse household and production surveys can be reorganised in a systematic manner within the SAM framework. The data can be cross-checked for consistency and reconciled under the logic of double-entry bookkeeping. The SAM hence offers an adequate accounting system to reconcile the dispersed and incomplete economic data that is typically found for war-torn, low-income economies (see chapter I).

The are generally six basic types of accounts in the SAM: production activities, commodity, factors (labour and capital), the current accounts of the domestic institutions (i.e. households, firms and government), the capital account and the rest of the world. Production can be defined in terms of a set of production activities classified according to criteria such as type of commodity, level of technology, and prevailing form of organisation. Schematically, the system functions as follows: the production activities generate a flow of value added which accrues to the various factors of production which, in turn, can be broken down according to labour skills, types of capital, and land classification. The resulting factorial income distribution provides the major source of income for the institutions. Then transfers are added. Finally, institutions spend their incomes on a variety of commodities and services which are supplied by production activities, thus completing the feedback system or "loop". This reveals the situation prevailing at one point in time, which usually corresponds to a fiscal year. In other words, a SAM shows how sectoral value added accrues to production factors and their institutional owners, how these income -- corrected for net current transfers -- are spent, and how expenditures on commodities lead to sectoral production and value added. The leakages from this cycle, e.g. in the form of payments abroad or savings, are also shown. Capital finance may then be linked to savings, presenting a glimpse of the dynamics in an economy (King, 1981, Arida and Taylor, 1988; Keuning and de Ruijter, 1988).

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Depending on the aim of a study, the various accounts can be specified at different levels of aggregation. The SAM may further cover different economic entities (nation, region, community, village). The convention of double-entry bookkeeping guarantees that there is no leakage or injection into the system, as every flow must go from one account to another. Extension of the input-output model to a SAM framework is performed by partitioning the accounts into endogenous and exogenous accounts and assuming that the column coefficients of the endogenous accounts are all constant. Endogenous accounts are those for which changes in the level of expenditures directly follow any change in income, while exogenous accounts are those for which expenditures are set independently of income. Exogenous accounts often encompass the government, capital and/or rest-of-the-world accounts, justifying the choice on the basis of macroeconomic theory coupled with the objective of the study.

The SAM can be converted into linear models by assuming constant distribution and expenditure coefficients, in addition to the standard Leontief constant production coefficients. As mentioned above, one major use of multiplier models in the SAM framework has been to explore issues of income distribution. The linear multipliers provide a way to do comparative analysis of the impact of exogenous changes in various coefficients, or shifts in the size and composition of final demand for sectoral production and employment. This enables the computation of direct as well as indirect effects of an exogenous shock. Indeed, the close-loop character of the SAM formulation implies that the incomes of production activities, factors and institutions are all derived from injections into the economy via a multiplier process, as elaborated further below.

The SAM framework suffers from severe limitations that reduce its applicability as a model because of several stringent underlying assumptions: no substitution effect, no resource constraint, no room for price effects, constant coefficients, etc. (see section III.5). Nonetheless, the SAM framework makes it possible to simulate shifts in taxes, exports, investment, demand for public services and in transfers to value added or households, as empirically demonstrated below in the case of a Guatemalan SAM. The multiplier model provides information on the impact of such changes on labour and capital remuneration, income of the various household categories as defined in the SAM, government revenues, savings and imports. In the application that follows, the SAM-based model helps predict and understand the reactions of various

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socioeconomic groups to economic policy reform options. It thus contributes to politically informed decisions.

III.2 SAM AS A MULTIPLIER MODEL

The SAM can be used as a basis for simple modelling[9]. More specifically, the effects of exogenous injections on the economic system as a whole can be explored by multiplier analysis, which requires partitioning the SAM into endogenous and exogenous accounts. The assumptions of SAM-based models are similar to those of traditional input-output models, i.e. fixed, linear coefficients (hence stable average propensities to spend); constant expenditure shares; constant expenditure income elasticity; complementary factor inputs; and excess capacity throughout the economy. Thus, the applicability of SAM-based models remains limited to situations characteristic of the Keynesian environment of a fix-price model, with excess production capacity and absence of substitution. Yet the SAM approach presents several advantages over the traditional input-output analysis:

- In the input-output model the exogenous part is the final demand vector, whereas there are several options regarding the choice between endogenous and exogenous accounts in the case of a SAM embracing the whole circular flows diagram. We recall that endogenous accounts are those for which changes in the level of expenditure directly follow any change in income, while exogenous accounts are those for which we assume that the expenditures are set independently of income.

- It is important to stress a major difference between SAM-based and Leontief models. Multipliers in the former encompass the effects of an increase in income on production, which is not the case with the Leontief model. SAM multipliers are thus larger than the corresponding input-output ones, for value added and incomes generate demand linkages in the SAM framework while only intermediate demand serves as a multiplier in the input-output analysis, value added being a leakage (see equations 9 and 10 below).

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[9] The reader who is familiar with SAM-based models and the decomposition of accounting multipliers can skip this section and move straight to section III.3 which deals with the Guatemalan case study.

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- A major flaw of the input-output framework is that the agricultural sector has very low production multipliers as it captures only the production backward and forward linkages. The low production linkages of the primary sector served as an argument in favour of an industry-led development pattern in the 1960s and 1970s. The use of the SAM framework provided new arguments for a development strategy based on agriculture (see de Janvry and Sadoulet, 1995): by considering the linkage effects created by agriculture on labour and household incomes, the SAM multipliers show that the primary sector does not fare any worse than the industrial sector.

The multipliers can be interpreted as the effect of an injection of one unit in the exogenous account(s) on the endogenous accounts. Standard practice is to pick, for the exogenous accounts, one or more among the government, capital, and rest-of-the-world accounts. If a single account is taken as exogenous, the fact that the endogenous accounts must all balance at a new equilibrium guarantees that the exogenous account will also balance, since the SAM as a whole must balance. If two or more accounts are set exogenously, then only their sum must balance. Each choice of which accounts are endogenous defines a different macro "closure" to the SAM model. The endogenous accounts should at least comprise the three following categories or modules: productive activities, factors of production and institutions. The range of shocks that can be studied with a SAM model then depends on the choice of the exogenous accounts. With an exogenous government account, changes in demand for administrative services and in transfers to value added or households can be simulated. With an exogenous capital account, shocks are mainly changes in investment, and with an exogenous rest-of-the-world account, changes in exports. In all cases, the multiplier model gives the impact on the structure of production and on factor and institution incomes. It also provides information on the leaks on exogenous accounts (e.g. government revenues, savings, and imports).

Following the presentation and notation suggested by Defourny and Thorbecke (1984), table III.1 shows a partition of a SAM involving three endogenous accounts.

Table III.1: Simplified partitioned SAM

			Expenditures				
			Endogenous accounts			Exog.	
			Factors	Households	Production activities	Sum of other accounts	Totals
Receipts	Endo-genous accounts	Factors	0	0	T_{13}	x_1	y_1
		Households	T_{21}	T_{22}	0	x_1	y_2
		Production activities	0	T_{32}	T_{33}	x_3	y_3
	Exog.	Sum of other accounts	i_1	i_2	i_3	t	y_x
		Totals	y_1	y_2	y_3	y_x	

The matrix T_{33} corresponds to the input-output transactions matrix. T_{13} allocates the value added generated by the various production activities into income accruing to the factors of production. The matrix T_{21} maps the factorial income distribution into the household income distribution, and matrix T_{22} refers to the income transfers within and among household groups. Finally, matrix T_{32} captures the expenditure pattern of the various institutions for the different commodities which they consume.

In table III.2 below, the totals for incomes received by endogenous accounts are given by the column vector y_n, which consists of two parts arising from (i) expenditures by the endogenous accounts recorded as T_{nn} and summed up as column vector n; and (ii) injections referring to expenditures by the exogenous accounts T_{nx}, and summed up as x.

Table III.2: Partitioning of a SAM

		Expenditures				Totals
		Endogenous	Sum	Exogenous	Sum	
Receipts	Endogenous	T_{nn}	n	Injections T_{nx}	x	y_n
	Exogenous	Leakages T_{xn}	l	Residual balances T_{xx}	t	y_x
	Totals	y'_n		y'_x		

We can write for the incomes received by the endogenous accounts

$$y_n = n + x \qquad (1)$$

and analogously for the exogenous accounts

$$y_x = l + t \qquad (2)$$

The elements of the endogenous transaction matrix T_{nn} can be expressed as ratios of their column sums, that is as average expenditure propensities,

$$T_{nn} = A_n y_n. \qquad (3)$$

Hence, the column of A_n show expenditures as proportions of total income (y'_n in table III.2) while T_{nn} provides the absolute amount. In equation (3), y_n is a diagonal matrix whose elements are y_i, $i = 1,...,n$. Along the same lines,

$$T_{xn} = A_l y_n \qquad (4)$$

When introducing the matrices A_n and A_l, we can express n and l as

$$n = A_n y_n \qquad (5)$$

$$l = A_l y_n \qquad (6)$$

Combining equations (1) and (5), we obtain the multiplier matrix M_a,

$$y_n = A_n y_n + x = (I - A_n)^{-1} x = M_a x \qquad (7)$$

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By multiplying injections (x) by the multiplier matrix M_a, equation (7) yields the vector of endogenous incomes (y_n). In other words, we obtain the income levels of factors (y_1), households (y_2) and production activities (y_3) which are endogenously determined as functions of the exogenous injection (x). M_a is also called "the accounting multiplier matrix". It is important to stress that a major limitation of the accounting multiplier matrix is that it implies unitary income elasticities, meaning that the prevailing average expenditure propensities are assumed to apply to any incremental injection.

III.2.1   Decomposition of SAM Multipliers

Pyatt and Round (1979) have shown that, based on the partition of the endogenous section of the SAM into three categories or modules of endogenous accounts (activities, factors and institutions), the matrix of multipliers can be decomposed into four components. These are the initial injection, transfer effects, open-loop and close-loop effects. A shock, or injection, is given by a change in elements of the exogenous accounts. The model solves for the equilibrium level of all the endogenous accounts. The coefficients in the rows of the exogenous accounts provide the leakages which can be, for instance, the induced demand for imports, the induced government revenues, and the induced savings.

A comparison of tables III.1 and III.2 shows that T_{nn} is partitioned. The corresponding partition of the matrix of average expenditure propensities is as follows:

$$A_n = \begin{vmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{vmatrix} \tag{8}$$

We then combine equations (7) and (8) and solve for the production activities vector, and obtain

$$y_3 = A_{33}y_3 + (A_{32}y_2 + x_3) = (I-A_{33})^{-1}(A_{32}y_2 + x_3). \qquad (9)$$

In contrast, the open Leontief model can be expressed as follows:

$$y_3 = (I-A_{33})^{-1}f \qquad (10)$$

as A_{33} is the input-output coefficient matrix and f the exogenous final demand. Equation (9) includes in the elements of final demand of the Leontief model the effects of income distribution (y_2) on household consumption through A_{32} which reflects the consumption pattern of each household group. This formulation contains more information and a higher degree of endogeneity than in equation (10) since it captures the effects of income distribution on consumption (Defourny and Thorbecke, 1984). SAM-based models may follow the same logic as the Leontief one, they nonetheless have the advantage of providing essential information on the distributional impact of economic measures. They may thus help in the design of policy reforms that are politically better informed.

Following the original multiplicative decomposition by Pyatt and Round (1979), we can obtain a more elaborate and general expression from the accounting model presented above, which is a decomposition of equation (7) above. For any matrix A^o_n of the same size than A_n and such that $(I-A^o_n)^{-1}$ exists, we can write

$$y_n = A_n y_n + x = (A_n - A^o_n)y_n + A^o_n y_n + x$$
$$= (I-A^o_n)^{-1}(A_n - A^o_n)y_n + (I-A^o_n)^{-1}x$$
$$= A^* y_n + (I-A^o_n)^{-1}x. \qquad (11)$$

Multiplying throughout by A^* and substituting for $A^* y_n$ on the right-hand side of equation (11) gives

$$y_n = A^{*2} y_n + (I+A^*)(I-A^o_n)^{-1}x \qquad (12)$$

Similarly, multiplying both sides of (12) by A^{*2} and substituting for $A^{*2} y_n$ in this last expression – provided that $(I-A^{*3})^{-1}$ exists – gives

$$y_n = A^{*3} y_n + (I+A^*+A^{*2})(I-A^o_n)^{-1}x$$
$$= (I-A^{*3})^{-1} + (I+A^*+A^{*2})(I-A^o_n)^{-1}x. \qquad (13)$$

For the purpose of multiplier decomposition, Pyatt and Round posit that

$$A^o{}_n = \begin{vmatrix} 0 & 0 & 0 \\ 0 & A_{22} & 0 \\ 0 & 0 & A_{33} \end{vmatrix} \tag{14}$$

and A^* as defined in equation (11) can be expressed as

$$A^* = \begin{vmatrix} 0 & 0 & A^*_{13} \\ A^*_{21} & 0 & 0 \\ 0 & A^*_{32} & 0 \end{vmatrix} \tag{15}$$

where $A^*_{13} = A_{13}$, $A^*_{21} = (I- A_{22})^{-1} A_{21}$ and $A^*_{32} = (I- A_{33})^{-1} A_{32}$. The authors further derive a general expression of the equation *(13)* on the grounds that, mathematically speaking, A_n could be partitioned in as many sets of accounts as one may wish:

$$y_n = (I- A^{*k})^{-1} +(I+A^*+ A^{*2}+...+ A^{*(k-1)}) (I- A^o{}_n)^{-1} x. \tag{16}$$

Yet the conceptual framework of economics dictates three partitions of A_n which correspond to factors, endogenous institutions and production activities. This also reflects the three steps in the sequence of substitutions that correspond to one full cycle in the circular flow of income within the economy. Using the notation of table III.1, Defourny and Thorbecke (1984) depict this income flow as follows:

Figure iii.1: Circular flow of income within the economy
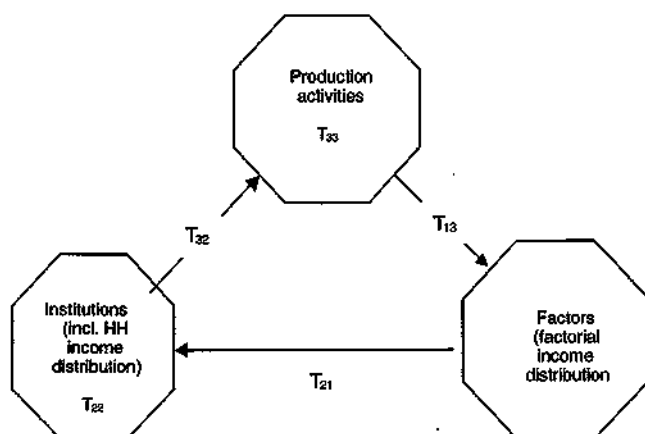
An injection in the production activities will first generate a flow of income to the factors of production, and then this income will be distributed to the institutions. The third step is that the income flow goes back to the original account in which the injection has taken place, i.e. production activities. The first and second steps are captured by the open-loop multipliers, while the third step refers to the close-loop multipliers.

This representation implies that $k=3$ in equation (16). Considering equation (7), the multiplier matrix M_a can be expressed, in its multiplicative form, as the product of three matrices:

$$M_a = M_3 M_2 M_1 \tag{17}$$

With $M_3 = (I - A^{*3})^{-1} x$, $M_2 = (I + A^* + A^{*2})$, and $M_1 = (I - A^o_n)^{-1}$. M_3 represents the full circular effects of an income injection going back to its point of origin in a series of repeated cycles (own indirect or extra-group effects). The total effects once the income has come back to the original

account where the injection took place are referred to as "close-loop effects". M_2 shows the cross-effects of the multiplier process and corresponds to open-loop effects (injections into one part of the system have repercussions on other parts). As is the case with input-output multipliers, M_1 captures the direct or intra-group effects such as the transfers of goods between activities or the distribution of corporate profits to households. On the contrary, M_2 and M_3 capture the consequences of the circular flow of income within the economy.

Defourny and Thorbecke (1984) provide another version of this decomposition process which they called the additive form :

$$M_a=I+T+O+C \qquad\qquad (18)$$

This additive form is related to the multiplicative decomposition presented earlier in the following way:

I The initial injection (identity multiplier effects);

$T=(M_1-I)$ The net contribution of the transfer multiplier effects;

$O=(M_2-I)M_1$ The net contribution of the open-loop or cross multiplier effects;

$C=(M_3-I)M_2M_1$ The net contribution of the circular close-loop effects.

Following this additive decomposition method, equation *(18)* means that the matrix of accounting multipliers M_a is equivalent to the sum of the identity matrix (unitary injection in each endogenous account), the transfer matrix, the open-loop and close-loop matrices. The multiplier decomposition method presented by Defourny and Thorbecke (1984) distinguishes each element of the SAM multiplier effects into direct, total and global influences.

The standard Leontief model is primarily concerned with the transfer multipliers and captures the direct or intra-group effects in production activities. SAM-based models add the open-loop and dimensions in the multiplier analysis, based on the logic of the circular flow of income within the economy. In the simulations below, we therefore outline the combined effects of open-loop and close-loop multipliers in order to single out the specific contribution of the social accounting framework in distributional analysis. The most interesting conclusion that one can draw from SAM-based models is not only to assess the impact of a policy shift on different

socioeconomic categories, but also the political risk associated with it. This can be done by combining distributional analysis with information on the power structure within the society to evaluate the political feasibility of policy economic reform.

III.3 A SAM FOR GUATEMALA

The Guatemalan SAM presented in this section is based on an accounting table by Cruz and Serra (1989) which is reproduced in annexe III.1. The authors reorganised the 1986 Guatemalan national accounts in a rectangular table along the same lines as that of a SAM. First, they aggregated the 45 production sectors appearing in the latest input-output table (base year 1971) into a seven sector table: traditional agricultural exports, nontraditional agricultural export, subsistence agriculture, manufacturing, oil and lubricants, services and commerce. The annexe III.1 further provides detailed explanation on the notation used in – and content of – the accounting table of Cruz and Serra.

Some of the coefficients were updated to account for structural changes between 1971 and 1986:

- As the intermediate demand for goods produced by the backward agricultural sector which resulted from the input-output table was inconsistent with the 1986 national account data, Cruz and Serra added 363.6 millions Quetzales (national currency, hereafter referred to as qtz) corresponding to corn and fodder. This additional intermediate demand was allocated to the three rural sectors and manufacturing.

- The 1971 input-output matrix provided value added figures for each productive sector, divided into wages and other value added. Cruz and Serra multiplied each wage category by the corresponding real wage change rate between 1971 and 1986, based on World Bank data.

- Although the 1971 input-output matrix had an intermediate import demand coefficient for each sector, Cruz and Sera considered instead the 1986 international trade statistics, and allocated intermediate goods to the seven productive sectors using the input-output table.

The authors then used the data from the 1986-87 household expenditure survey to derive the household accounts. They aggregated consumption of

goods and services into the seven categories corresponding to the productive sectors defined above. The expenditure survey considered different income groups and geographical zones. Based on this, Cruz and Serra distinguished between rural workers, industry workers, service workers and capitalists, assimilating each category to an income group and to the rural or urban geographical zone (see below). The other accounts have been constructed by drawing all relevant data from the national accounts, the balance of payments and other statistics provided by the Banco de Guatemala (central bank).

The table by Cruz and Serra (1989) presents the national accounts in a double-entry accounting format, but departs from a SAM in several respects: the table is not square, there are no institution accounts as such – the household and firm accounts being implicitly merged into the production factor accounts – and the row totals do not equal the column sums, just to mention a few departures from a standard SAM. The accounting table by Cruz and Serra cannot be used to compute linear multipliers required to assess the distributional impact of exogenous shocks. We therefore correct, adjust and reorganise all the data in a consistent SAM framework. To this end, we classify the Guatemalan accounts along a standard SAM structure, as depicted in annexe III.2. We create institution accounts which are essential to trace how factorial incomes are distributed among household groups and other institutions (firms, government). We also distinguish between current accounts and capital accounts, the later being further split between the government capital account, private capital and the rest-of-the-world account.

In order to construct a consistent social accounting matrix for Guatemala based on the structure outlined in annexe III.2, we have to correct, adjust and rearrange all the accounts. We use both data from the the the Banco de Guatemala (central bank) and a series of balance sheets provided by Cruz and Serra (1989): government income and expenditure – including data on tariff revenue, tariff payment by sector and consumption taxes by sector; balance of payments; financial relations with the rest of the world; central bank operations; and balance sheets for households, firms and the financial sector. The main adjustments and corrections are presented in annexe III.3.

The paucity and weakness of data on income distribution pose severe limitations for distributional analysis. The extreme concentration of wealth and income in Guatemala is a highly sensitive political issue, and it is not surprising that the authorities did not make any effort – and even resisted

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attempts – to conduct and publicise the outcome of detailed income and expenditure surveys. The only relevant information available to Cruz and Serra at the country level was the 1986-7 household survey published by the Guatemalan National Institute of Statistics (INE). The survey only provides information on *size income distribution*, but does not give any indication as to *functional income distribution* nor to income by activity categories. Households are simply classified by income classes and deciles. Since then, the only data which has been collected is another expenditure survey carried out in 1989 along the same lines as in 1986-7. As a result, the data available does not allow to map factor income into household income based on professional categories (e.g. independent labour, petty traders).

Because of the lack of data, we had to mechanically associate each factor account with a household group whose expenditure pattern corresponds to that of households with a given annual income, according to information provided by the 1986-7 expenditure survey. We associated the rural low-income household group with the "rural labour" factor and, following Cruz and Serra, further assimilated their expenditure structure to that of households with an annual income of qtz 1,200. In the same way, the urban low-income group is assionlated to urban labour in the manufacturing sector with a consumption pattern of households whose annual income ranges between qtz 1,201 and 2,400. The urban middle-income group is associated with labour in the service sector (expenditure structure of households with an annual income between qtz 2,401 and 4,800), and the high-income group is assimilated to capital (qtz 7,201 - 12,000).

Departing from the table of Cruz and Serra, we then relocate consumption outlays from the factor accounts to the household accounts. We eventually obtain the accounting table in annexe III.4, which is fully consistent in terms of double-entry bookkeeping. It provides interesting information on direct and indirect taxes, which we wish to keep in the final SAM for the purpose of simulating various fiscal policy options. To get a square matrix, we add four column-accounts that correspond to direct and indirect taxes. Row-wise, customs tariffs on consumption and capital goods are merged in a single "customs tariff" account. We further sum up the private and public capital accounts in a consolidated capital account. The result is a fully consistent social accounting matrix for Guatemala that is reproduced in annexe III.5, which further provides a detailed description of what comes under each account. To avoid confusion, we use the same notation as Cruz

and Serra (see annexe III.1: *PA* for production activities, *FP* for factors of production, *HH* for households, etc.).

III.3.1   Structure of the Guatemalan Economy

Social accounting matrices provide a lot of information about the economy. In this section, we analyse various features of the Guatemalan economy following the logic of the circular interdependence embedded in the SAM. We start from the productive process, followed by the primary and secondary distribution of income and consumption or demand back to the productive activities.

We first analyse the *sectoral structure of domestic production and value added*. We extract the outlays of the production activities from the SAM to assess the contribution of each activity or sector in terms of imports, intermediate inputs, value added at factor cost, net indirect taxes and total supply. As shown in table III.3 below, the primary sector accounts for 29.5 per cent of value added while the share of manufacturing lies under 15 per cent. The import structure reflects the productive specialisation of the Guatemalan economy. Roughly two thirds of the imports are goods which either are manufactured goods or enter into manufacturing activities as intermediate products.

Table III.3: Contribution of each sector to total supply, in % share

	Imports	Intermediate inputs	Value added	Net indirect taxes	Total supply
1-PA-Traditional agr sec	2.6	5.7	15.9	17.6	13.4
2-PA-Hybrid agr sec	0.9	2.7	9.5	1.1	5.7
3-PA-Backward agr sec	7.7	2.2	4.1	1.5	3.9
4-PA-manuf 1	61.1	53.3	14.5	8.5	29.1
5-PA-manuf 2	1.5	1.3	0.3	0.1	0.7
6-PA-fuels	14.7	0.7	0.1	0.6	1.3
7-PA-services	11.5	20.0	31.7	20.5	25.5
8-PA-commerce	0.0	14.1	23.8	50.2	20.5
Total	100.0	100.0	100.0	100.0	100.0

N.b.: PA stands for production activities. See annexe III.5-cont for a definition of each sector.

The information provided by the SAM is fully consistent with our findings in chapter VI, which focuses on the Guatemalan economy: Table V.3 in particular reports the breakdown of GDP by type of economic activity, but this time based on the literature and statistical data available on the Guatemalan economy. Consistent with this information, the insight drawn from the SAM in the table above confirms that Guatemala has an important agricultural sector which largely relies on the abundance of low-cost indigenous labour in agriculture. The primary sector still accounts for about a quarter of GDP and for more than two thirds of merchandise export earnings, coffee ranking first. Besides a modern sector producing traditional agricultural export goods – mainly coffee, sugar, bananas, cotton, beef and cardamom – the bulk of agricultural labour is in the backward subsistence sector which produces staple food crops for domestic consumption: basic grains, potatoes and legumes. A more recent hybrid sector emerged in the 1980s and produces "nontraditional" agricultural exports such as fruits, vegetables, timber, rubber and ornamental plants.

There are wide differences in the shares of each of the productive activities in terms of intermediate inputs and net indirect taxes. These differences can be better appreciated by looking at the share of the various cost components in total supply, as shown below in table III.4. This is especially interesting with regard to multiplier models and for our subsequent assessment of demand injections into different production

activities. Those activities with a higher share of value added to total cost are likely to have a higher degree of endogeneity – or smaller leakage – with respect to the circular flows diagram. This is the case of the agricultural sector with a share of value added to total supply comprised between 57 per cent and 81 per cent.

Table III.4: Composition of total supply
- % share of major supply component for each sector

	Imports	Intermediate inputs	Value added	Net indirect taxes	Total
1-PA-Traditional agr sec	2.0	17.8	70.0	10.2	100.0
2-PA-Hybrid agr sec	1.3	16.3	81.2	1.2	100.0
3-PA-Backward agr sec	18.8	21.9	56.6	2.8	100.0
4-PA-manuf 1	16.6	58.9	22.7	1.8	100.0
5-PA-manuf 2	17.1	60.6	21.7	0.8	100.0
6-PA-fuels	79.6	15.5	2.4	2.6	100.0
7-PA-services	4.0	28.0	62.6	5.4	100.0
8-PA-commerce	0.0	24.7	58.8	18.5	100.0
Total	8.6	35.2	49.6	6.6	100.0

The value added share in total supply is around 60 per cent for commerce and services. This means that such activities are likely to generate higher incomes which are then distributed to institutions and transformed into demand within the system. On the contrary, imports and taxes represent leakages in the multiplier model. Overall, import is a slightly more important source of leakage than tax (8.6% against 6.6%). As expected, import shares in total supply are negligible for the two agricultural export sectors and commerce, while they are substantial for staple crops (backward agr. sector) and manufacture (e.g. import of capital goods), and much higher for fuels as Guatemala is far from oil self-sufficiency. Not surprisingly, indirect taxation is above 10 per cent of supply in the commerce sector as a result of consumption taxes. This is also the case of the traditional agricultural export sector as a result of heavy export duties which were still applied in 1986. In general, the share of intermediate inputs varies according to the degree of backward vertical integration within and outside the same sector. The degree of integration is usually higher for the manufacturing sector, as the table above confirms for Guatemala.

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Turning to the analysis of the receipts of the production activities, the various sectors exhibit very different shares in the demand components, as table III.5 illustrates. The table clearly reflects the overwhelming weight of a few traditional agricultural export products (primarily coffee and banana) which account for more than 50 per cent of total exports. Nontraditional agricultural exports were on the rise, but still represented less than 10 per cent in 1986. The manufacturing sector represents about one fourth of total exports. Table III.5 shows that, as described in annexe III.5-cont., the sector "PA-manufacture 2" only refers to industrial goods which are wholly exported (see also description of the Guatemalan economy in chapter V).

Table III.5: Contribution of each sector to total demand, in % share

	Intermediate output	Final consumption	Investment	Exports	Total
1-PA-Traditional agr sec	6.3	8.4	2.9	56.2	12.6
2-PA-Hybrid agr sec	8.5	4.2	4.5	7.1	5.7
3-PA-Backward agr sec	6.6	3.7	1.1	0.0	3.7
4-PA-manuf 1	32.5	27.6	40.6	18.7	29.5
5-PA-manuf 2	0.0	0.0	0.5	5.6	0.7
6-PA-fuels	2.5	0.6	0.1	2.3	1.2
7-PA-services	27.5	25.8	46.6	10.1	27.0
8-PA-commerce	16.0	29.8	3.8	0.0	19.5
Total	100.0	100.0	100.0	100.0	100.0

Investment is concentrated in the manufacturing and service sectors. This is not surprising, all the more so as the service sector comprises construction. Commerce ranks first in contributing to final consumption, followed by manufacture and services.

Table III.6 turns to the primary income distribution from production activities to factors of production. The wide differences largely stem from the technology used in a given sector (labour type and labour versus capital) and from the overall socioeconomic settings. The contribution of each sector to value added at factor cost is reproduced here pro memoria. Land is considered as a specific type of capital, and is thus included in table III.6 under FP-capital.

Table III.6: Composition of value added (at factor cost) between production factors, and sector shares of value added

	FP-rural work	FP-urban work	FP-serv. work	FP-capital	Total	Value added % of total
1-PA-Traditional agr sec	37.0	0.0	0.0	63.0	100.0	15.9
2-PA-Hybrid agr sec	16.5	0.0	0.0	83.5	100.0	9.5
3-PA-Backward agr sec	40.0	0.0	0.0	60.0	100.0	4.1
4-PA-manuf 1	0.0	26.7	0.0	73.3	100.0	14.5
5-PA-manuf 2	0.0	29.8	0.0	70.2	100.0	0.3
6-PA-fuels	0.0	59.3	0.0	40.7	100.0	0.1
7-PA-services	0.0	0.0	29.4	70.6	100.0	31.7
8-PA-commerce	0.0	0.0	31.1	68.9	100.0	23.8
Total	8.6	6.5	15.8	70.1	100.0	100.0

In a SAM framework, it is interesting to assess to what degree the value added generated in a given sector is distributed to labour or to capital (and land). This is because capital income is subject to much more leakage given its higher propensity to save and its higher taxation burden. This type of leakage is often reflected in SAM models to the extent that savings are classified as an exogenous account. Yet, savings and investment may also be considered as endogenous in models that are oriented toward long-term analysis.

In all sectors but fuels, the capital factor takes the biggest income share from value added. This indirectly results from the balance of power within Guatemalan society: low wages and a high concentration of wealth and assets in the hands of a few. It is especially striking that in all three agricultural sectors, the majority of value added goes to the capital factor while a small share is allocated to rural labour. It is in the hybrid agricultural export sector that the share of value added accruing to capital is the highest (88.5%), which may be due to the fact that this sector requires higher capital investment than backward agriculture.

Finally, table III.7 presents the distribution of value added by factors of production to household groups. This table highlights a major weakness in

our SAM which results from the fact that we had to create household categories based on the accounting table by Cruz and Serra (1989). In the absence of relevant data from household income surveys which would provide information on how factor income is distributed among different household groups, the only solution was to directly associate each household group with one of the four factors of production, as described earlier. Table III.7 thus strongly overstates the fact that high-income households receive their income primarily (here exclusively) from capital, middle-income households from labour in the services sector, and urban low-income households from urban labour. One may assume that given the extreme land and capital concentration that characterises the country, labour income is rather negligible in the case of powerful land and capital owners. This tends to legitimate our basic assumption, but should ideally be cross-checked with relevant data that may be available for neighbouring countries (e.g. El Salvador, Honduras).

Tabla III.7: Secondary income distribution of value added by factora of production to household groups

	FP-rural work	FP-urban work	FP-serv. work	FP-capital	Total	Total income
Rural low inc. HH	80.5	0.0	0.0	19.5	100.0	12.6
Urban low inc.HH	0.0	100.0	0.0	0.0	100.0	6.5
Urban middle inc.HH	0.0	0.0	99.8	0.2	100.0	24.3
High income HH	0.0	0.0	0.0	100.0	100.0	56.7
Total	10.1	6.5	24.2	59.2	100.0	100.0

Urban middle-income households receive 0.2 per cent of their income from net interests (deposits). Rural low-income households however, receive some 19.5 per cent of their income from capital. This may actually reflect revenues from small farm holdings, i.e. income from the land factor, which is included in capital.

III.3.2 Multiplier Decomposition

We follow the additive method by Defourny and Thorbecke to calculate the different multipliers for our Guatemalan SAM[10]. The outputs are presented in annexe III.6, listed under numbers 1 to 11:

- *Table 1* provides the income shares or average propensities, which are then broken down into the matrix of average propensities of the endogenous accounts A_n (*table 2*) and the average propensities of the exogenous accounts A_l (*table 3*).

- *Table 4* is the aggregate multiplier matrix M_a and *table 5* is the leakage multiplier matrix.

- *Table 6* shows the direct effects or intra-group matrix M_1, *table 7* the own indirect effects or extra-group matrix M_2, and *table 8* the cross-effects matrix M_3.

- *Table 9* refers to the transfer multiplier effects T that capture the direct effects resulting from interactions within each category of accounts (e.g. transfers among institutions).

- *Table 10* is the open-loop multiplier effects matrix O that captures the interactions among and between the three endogenous categories of accounts (e.g. from factor income on household revenues).

- Finally, *table 11* represents the multiplier effects matrix C that captures the full circular effects of an income injection going through the system back to its point of origin (e.g. from activities, to factors, to institutions, and then back to activities in the form of consumption demand).

These matrices being calculated, we can now run simulations to assess the main options facing the Guatemalan government with regard to economic policy reform required by the peace accords, chiefly in the area of taxation, fiscal policy and government expenditures.

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[10] We calculate all the multiplier effect matrices with the help of the econometric software package *EViews* except the matrix of average propensities (calculated with Excel).

III.4 SIMULATIONS

The SAM-based multiplier model allows us to simulate various types of exogenous shocks. This is done by pre-multiplying the vector of initial transfers by the matrix M of accounting multipliers – or by the matrices O, T and C for the open-loop, transfer and close-loop effects respectively. We can write this in equation form:

$$\Delta y \approx M_a \Delta x \qquad (17)$$

whereby each policy shift to be analysed is characterised by a vector of initial shock Δx and its resulting impact Δy.

We run four simulations relating to fiscal and tax policy shifts and assess how they affect income distribution at the household level in Guatemala. Our first simulation below focuses on an increase in government spending while the following three simulations all deal with changes in taxation. We choose to focus on these issues in the case of Guatemala because tax reform is the major economic challenge on the post-conflict agenda (see chapter V for a discussion). The tax revenue to GDP ratio in Guatemala is the lowest in Latin America, and taxation of personal income and wealth is extremely weak. The international financial institutions and a whole series of economic studies have long called for a major reform of the tax system and an end to endemic fiscal evasion. Fiscal policy is thus one of the major challenges of post-war Guatemala: compliance with the commitments made by the government in the 1996 peace accords requires ending the vicious circle of fiscal fraud and distrust between tax payers and the state. In addition, peace requires a substantial increase in government expenditure, as discussed in chapter V, mainly to assist the most vulnerable and decrease extreme inequalities between socioeconomic groups. To this end, one of the peace accords (Agreement on Land and Socioeconomic issues) sets as a target an increase of 50 per cent in the total tax to GDP ratio in order to pay for peace-related expenses, while stipulating that the tax reform should be "globally progressive".

We have chosen to treat the government and tax accounts as exogenous to the extent that they correspond to policy instruments. *The first simulation* traces the impact of an increase of qtz 100 million in government expenditure, which roughly corresponds to an overall increase of 6 per cent in public spending. In the injection vector, these qtz 100m have been apportioned to each account proportionally to the initial structure of

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government spending as reflected in the SAM. *The second, third and fourth simulations* relate to changes in taxation, which raises specific issues: first, tax shifts must be pictured as positive and negative income injections. As an example, an increase in corporate tax is injected into the system as a negative income in the firm account. Second, the income injections could come from any exogenous account and would have the same effects on the endogenous accounts, if not specified properly. We address this issue by specifying the injection vector so that it reflects in fixed proportion the existing tax structure. The injection vector is thus determined by the tax structure in the SAM (Keuning and Thorbecke, 1992). Third, we have to bear in mind that treating tax as an exogenous account is a simplification since shifts in taxation interact at the same time with the whole set of circular interdependence characteristic of any economic system. In the real economy, they are feedbacks on the tax accounts due to initial changes and the ensuing leaks from the circular flow of income within the economy. All three simulations are designed to be initially budget-neutral: the injection vector is the difference between positive and negative injections of equal amounts across two or more exogenous tax accounts. But because of the leak in the government account, this does not mean that the final output is neutral for the budget.

More specifically, *the second simulation* captures a shift of qtz 100m in tax revenue from the import duty to value added tax (VAT) accounts. This is intended to reflect the main fiscal policy trends between 1986 (base year of the SAM) and 1996: during that period, the value added tax rate was eventually raised from 7 per cent to 10 per cent while average customs duties decreased under the combined effects of accession to the GATT/WTO and the revival of the Central American Common Market (see presentation in chapter V). Both customs and value added taxes apply to production activities but their distribution across the various sectors differs. We assume that the increase of qtz 100m in value added tax and the decrease of qtz 100m in import duties are proportional to their respective initial tax burden. This means that if a given sector pays twice as much customs tax as another, the decrease in duties will also be twice as much. The injection vector is, for each of the two exogenous accounts, the sum of the ensuing increase in value added tax and decrease in customs duties, i.e. the net result of a positive and a negative injection. Overall, the sum of the injections is zero (budget neutrality).

The third simulation refers to an increase of qtz 100m in direct taxes and a decrease of qtz 100m in "other indirect taxes". The augmentation focuses

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mainly on personal and corporate taxes while the reduction of other indirect taxes primarily captures a sharp decrease in export duties and specific consumption tax. As in the second and fourth simulations, tax shifts translate into positive and negative income injections. *The fourth simulation* is a combination of the latter two: customs duties and other indirect taxes are reduced by qtz 100m each, which is compensated by an increase of equal amounts in direct taxation and value added tax. This is an attempt to simulate what would be the distributional impact of measures advocated by the international financial institutions, i.e. trade liberalisation coupled with an increase in value added tax and/or direct taxation.

The simulation outputs are presented in tables III.8 to III.11 while table III.12 focuses on the overall distributional impact of the four simulations on household groups and firms. The following tables report, for each scenario and in million Quetzales, the identity, transfer, open-loop, close-loop, and total accounting multiplier effects. Identity multiplier effects are obviously equal to the injection vectors. We add the open-loop and close-loop effects in a single column to highlight the specific multiplier effects of income flows across modules (or account categories). The accounting multiplier or total effects have been calculated with the Leontief inverse matrix of linear multipliers. As expected, the accounting multiplier effects are equivalent to the sum of the identity, transfer, open-loop and close-loop effects. Leaks in the exogenous accounts are also reported for each simulation, together with the total leaks in tax revenue for simulations two, three and four.

Table III.8: Simulation 1 - Increase of qtz 100m in government expenditure

Endo-genous accounts	Identity multiplier effects	Transfer multiplier effects	Open-loop multiplier effects	Close-loop multiplier effects	Close loop-open-loop effects	Accounting Multiplier or total effects	Leakages Exogenous accounts	Leaks
Traditional agr sec	0.00	1.90	6.41	14.08	20.49	22.39	Customs tariffs	43.97
Hybrid agr sec	0.00	5.47	8.97	20.78	29.75	35.21	Value added tax	45.21
Backward agr sec	0.00	2.26	11.50	25.19	36.69	38.95	Other indirect taxes	35.68
Manuf 1	12.51	2.91	8.58	21.53	30.11	45.53	Direct taxes	41.01
Manuf 2	0.00	0.00	0.00	0.00	0	0.00	Government	3.34
Fuels	0.00	2.87	7.08	21.11	28.19	31.05	Capital account	37.12
Services	1.12	1.76	9.83	23.09	32.92	35.83	ROW current	34.50
Commerce	0.00	1.82	12.67	31.06	43.73	45.54	ROW capital	0.00
Rural work	0.00	0.00	3.54	23.72	27.26	27.26		
Urban work	0.00	0.00	15.96	28.23	44.19	44.18		
Service work	48.01	0.00	3.01	27.45	30.46	78.47		
Capital	0.00	0.00	6.63	31.20	37.83	37.82		
LHH-rural	0.00	0.00	2.84	24.53	27.37	27.37		
LHH-Urban	5.92	0.00	13.36	26.51	39.87	45.78		
MHH-urban	5.65	0.00	48.46	27.82	76.28	81.93		
HH-Income	0.00	0.00	5.32	32.50	37.82	37.82		
Firms	14.30	0.00	4.57	27.91	32.48	46.78		
Total	87	19	186	406	574	681		

As expected, an increase in government expenditure is clearly expansionary and benefits all sectors and institutions. However, the fact that the identity multiplier effects are below 100 means that there is a leak of qtz 13m out of the initial injection of qtz 100m, which primarily corresponds to an increase in imports and thus does not enter into the endogenous economic cycle. As highlighted in bold above, the main beneficiaries are medium-income households which profit from increased labour income in the services sector, mainly via the open-loop multiplier effects. This can be explained by the fact that the latter household category comprises civil servants who benefit from the increase in government

current expenditure, as reflected in the injection vector. The induced demand translates into significant increased activity in the commerce sector and higher income for the "urban work" production factor.

Table III.9: Simulation 2 - Increase of qtz 100m in value-added tax and decrease of qtz 100m in customa duties

Endogenous accounts	Identity multipliers effects	Transfer multipliers effects	Open-loop multiplier effects	Close-loop multip. effects	Close-loop+ open-loop multiplier effects	Accounting multiplier or total effects	Leakages Exogenous accounts	Leaks
Traditional agr sec	1.62	5.24	0.00	4.41	4.41	11.27	Customs tariffs	3.35
Hybrid agr sec	-0.05	15.12	0.00	6.51	6.51	21.58	Value added tax	-31.06
Backward agr sec	1.39	6.70	0.00	8.05	6.05	16.14	Other indirect taxes	1.89
Manuf 1	35.27	7.29	0.00	6.91	6.91	49.46	Direct taxes	11.96
Manuf 2	0.00	0.00	0.00	0.00	0	0.00	Government	1.03
Fuels	-0.11	7.28	0.00	6.59	6.59	13.76	Capital account	9.89
Services	8.16	0.82	0.00	6.90	6.9	15.87	ROW current	20.60
Commerce	-46.27	3.43	0.00	9.79	9.79	-33.04	ROW capital	0.00
Rural work	0.00	0.00	8.29	5.37	13.66	13.67		
Urban work	0.00	0.00	40.86	6.74	47.6	47.60	Tax revenue	-13.86
Service work	0.00	0.00	-9.43	6.19	-3.24	-3.24		
Capital	0.00	0.00	5.48	7.12	12.6	12.59		
LHH-rural	0.00	0.00	7.23	5.33	12.56	12.56		
LHH-Urban	0.00	0.00	36.87	6.08	42.96	42.95		
MHH-urban	0.00	0.00	-9.15	6.02	-3.13	-3.12		
HH-income	0.00	0.00	5.48	7.12	12.6	12.59		
Firms	0.00	0.00	4.70	6.11	10.81	10.82		
Total	0.00	45	90	105	195	241		

As the table above shows, the overall impact of the injection is clearly expansionary, although the initial tax change is budget-neutral. This can be explained by a global income shift in favour of sectors and institutions with relatively lower leakages toward exogenous accounts. The table highlights that the redistribution of the indirect tax burden among sectors implies lower income in the commercial sector. This is largely

compensated by increased income in manufacturing activities, as shown in the identity multiplier effects. This primarily benefits urban labour and thus low-income urban households through cross multiplier effects. The overall social impact is rather positive to the extent that low-income households – in both urban and rural areas – end up better off. Politically speaking, the tax shift should not provoke outright opposition as high-income households benefit too while middle-income ones do not significantly lose.

Table III.10: Simulation 3 - increase of qtz 100m in direct taxes and decrease of qtz 100m in "other indirect taxes"

Endogenous	Identity multiplier effects	Transfer multiplier effects	Open-loop multiplier effects	Close-loop multip. effects	Close + open-loop effects	Accounting multiplier or total effects	Leakages Exogenous acc.	Leaks
Traditional agr sec	27.97	1.81	-13.02	5.39	-7.63	21.96	Customs tariffs	11.41
Hybrid agr sec	1.28	5.12	-19.86	7.97	-11.89	-5.49	Value added tax	17.25
Backward agr sec	0.48	7.47	-18.65	10.05	-8.6	-0.65	Other indirect taxes	19.07
Manuf 1	7.11	5.57	-20.32	8.32	-12	0.67	Direct taxes	-42.53
Manuf 2	0.15	0.00	0.00	0.00	0	0.15	Government	0.43
Fuels	0.69	16.03	-24.10	8.05	-16.05	0.86	Capital account	-16.10
Services	31.43	8.98	-23.85	8.92	-14.93	23.47	ROW current	-4.31
Commerce	30.90	4.97	-29.84	12.00	-17.84	18.03	ROW capital	0.00
Rural work	0.00	0.00	7.22	6.61	13.83	13.83		
Urban work	0.00	0.00	-7.46	8.12	0.66	0.66	Tax revenue	5.2
Service work	0.00	0.00	8.45	7.79	16.24	16.24		
Capital	0.00	0.00	5.02	8.84	13.86	13.86		
LHH-rural	0.00	0.00	21.68	-8.76	12.92	12.92		
LHH-Urban	0.00	0.00	11.24	-10.65	0.59	0.59		
MHH-urban	0.00	0.00	27.81	-12.01	15.8	15.80		
HH-income	-64.42	0.00	27.20	-13.34	13.86	-50.57		
Firms	-35.58	-4.31	23.36	-11.46	11.9	-27.88		
Total	0	43	25	35	60	54		

Again, the overall effect under this third scenario is expansionary, but to a lesser extent than in the former simulation. For obvious reasons, higher direct taxes translate directly into lower net income for firms and high-income households (see injection vector). The traditional agricultural export sector benefits from a decrease in export duties, which reflects positively on rural low-income households through the loop effects. The services and commerce sectors both profit from a diminution in excise and other consumption tax, which has a positive impact on medium-income households via cross multiplier or open-loop effects. But in the case of high-income households, the latter effects are not sufficient to offset the negative impact of the initial tax shift. The ensuing income deterioration may spur major discontent among the Guatemalan economic elite, and may thus not be politically viable.

Table III.11: Simulation 4 - combination of simulations 2 and 3

Endogenous	Identity multiplier effects	Transfer multiplier effects	Open-loop multiplier effects	Close-loop multip. effects	Close loop + open-loop effects	Accounting multiplier or total effects	Leakages Exogenous acc.	Leaks
Traditional agr sec	29.59	8.85	-13.02	9.81	-3.21	33.22	Customs tariffs	14.76
Hybrid agr sec	1.23	20.25	-19.86	14.48	-5.38	16.09	Value added tax	-13.80
Backward agr sec	1.87	14.17	-18.65	18.10	-0.55	15.49	Other indirect taxes	20.96
Manuf 1	42.37	12.85	-20.32	15.22	-5.1	50.13	Direct taxes	-30.57
Manuf 2	0.15	0.00	0.00	0.00	0	0.15	Government	1.46
Fuels	0.58	23.31	-24.10	14.64	-9.46	14.42	Capital account	-6.21
Services	39.59	7.78	-23.85	15.82	-8.03	39.34	ROW current	16.49
Commerce	-15.37	8.40	-28.84	21.78	-8.06	-15.02	ROW capital	0.00
Rural work	0.00	0.00	15.51	11.99	27.5	27.50		
Urban work	0.00	0.00	33.40	14.86	48.26	48.26	Tax revenue	-8.85
Service work	0.00	0.00	-0.98	13.98	13	13.00		
Capital	0.00	0.00	10.49	15.96	26.45	26.46		
LHH-rural	0.00	0.00	28.91	-3.43	25.48	25.48		
LHH-Urban	0.00	0.00	48.11	-4.57	43.54	43.54		
MHH-urban	0.00	0.00	18.66	-5.88	12.68	12.88		
HH-income	-64.42	0.00	32.68	-6.23	26.45	-37.97		
Firms	-35.58	-4.31	28.07	-5.35	22.72	-17.17		
Total	0	89	65	141	206	295		

As in the two former scenarios, the impact of the various tax changes in simulation 4 is expansionary. Income increases for all sectors but commerce, which is not surprising as this fourth simulation comprises an increase in value added tax. As in the third simulation above, the combination of tax shifts in the fourth simulation results in increased income for all institutions but high-income households and firms. This is because of the impact of higher corporate and personal income tax in the injection vector that cannot be compensated to a sufficient degree by the positive open-loop effects.

As a direct result of the initial injection, the positive transfer multiplier effects are clearly felt in the fuel, manufacturing and hybrid agricultural

sectors, and then through loop effects on rural and urban work as well as on capital factor income. The overall social impact is clearly progressive: low- and middle-income groups end up in a better situation while the richer segment of the society and the corporate sector have to pay more. But this is also why this policy option is a dangerous bet for the government: the latter may not be able to stay in power in the face of fundamental opposition from the most powerful group within the society.

We can eventually turn to the distributional impact of the four simulations and assess in particular how progressive or regressive the tax change proposals are. Table III.13 reports the relative change in income following shifts in government spending and taxation for each household category and firms.

Table III.12: Variation in the income of institutions (percentage of total income)

Simulation	Increase	Decrease	LHH-rural	LHH-Urban	MHH-urban	HH-income	Oi-firms	Total
1	Gvt expenditure		1.47	4.60	2.37	0.48	2.81	11.73
2	Value added tax (VAT)	Customs duties (CD)	0.67	4.31	-0.09	0.16	0.65	5.71
3	Direct tax (DT)	Other indirect tax (IT)	0.69	0.06	0.46	-0.64	-1.68	-1.11
4	VAT and DT	CD and IT	1.37	4.37	0.37	-0.48	-1.03	4.59

As highlighted earlier, SAM-based models may provide critical information for the design of policy reforms that are politically informed if combined with some understanding of the political dynamics in a given country. Table III.12 shows that the expansionary nature of the various policy interventions makes the results positive for institutions in a majority of cases. But looking at the four scenarios one after the other, it is particularly interesting to underscore the following:

* An increase in government expenditures (*simulation 1*) benefits low-income urban households in a greater proportion than other institution categories. This implies that these households profit from improved public services and government transfers to a greater extent than other groups. Low-income households in rural areas do not enjoy the same

access to government services, and do not benefit as much as urban households. The income increase is proportionally lower for high-income households, but in this case as a result of the higher absolute level of their initial income.

- Among the scenarios implying tax changes, the *second simulation*, which refers to higher value added tax and lower customs duties, fares best in terms of overall institutional income increase (5.7%). Thanks to cheaper prices on imports, firms and high-income households enjoy higher income, even if they pay higher value added tax. The only category which may lose slightly from the shift in taxation is medium-income households. Yet this scenario does not seem likely to cause much political turmoil to the extent that it does not entail any dramatic income deterioration for a specific group. This may partly explain why this policy mix has been adopted by the Guatemalan government over the past years (see chapter V).

- An increase in direct taxation coupled with a reduction of indirect taxes (*simulation 3*) is the only scenario that has a negative impact on the overall income of institutions (-1.1%). There seems thus to be good reason not to favour this option over other tax-neutral changes, even if the outcome is clearly progressive in terms of equity and income redistribution to the poor.

- The outcome of the *fourth simulation* implies a partial transfer from firms and high-income households to poorer groups. This combination of tax changes would clearly represent a progressive reform as it would contribute to reducing inequality. This option also seems politically favourable in that low-income urban households – a vocal group able to mobilise quickly and to pose a serious threat to the government – benefit from an income increase of 4.37 per cent. This would be good news for the international financial institutions to the extent that the simulation encompasses some of the measures recommended by them. Yet the members of the powerful oligarchy would clearly rank among the losers: the income of the richest category would decrease by 0.48 per cent and firms would lose by 1.68 per cent. This may explain why it has not been possible to introduce such measures successfully in Guatemala despite repeated attempts over the past fifteen years.

The analysis of the distributional impact of several changes in taxation helps explain why some measures have never been introduced successfully

while others passed through. The successive governments managed to gradually reduce customs tariffs and increase the value added tax rate without facing outright opposition from a powerful coalition. But all attempts to introduce a more progressive system, be it by introducing a new direct tax or by increasing revenues from existing ones, have failed. The output of simulations 3 and 4 explain why the ruling oligarchy and the economic elite have systematically opposed it as they, quite rightly, feel bound to lose[11]. On the other hand, the government has been unable and/or unwilling to muster sufficient popular support in favour of such reforms advocated by the international community.

The results presented above cannot be regarded as the strict quantitative outputs of the simulated measures, because of severe limitations embedded in SAM-based models which we discuss in the next section. The results rather provide an indication of general trends. The interpretation of results requires great caution. The model's multipliers are based on the original tax structure and do not incorporate the effects of changes in the tax structure associated with the injection. Besides, the institution categories as defined in our Guatemalan SAM cannot serve as a basis for a detailed analysis of income distribution at the household level. Because of the lack of data on the factorial income at the household level, we had to associate each factor of production with one household category in a somewhat mechanical manner.

III.5 LIMITATIONS OF SAM-BASED MODELS

The multipliers computed from a SAM tend to overstate the adjustment to exogenous shocks for several reasons. First, the SAM framework does not allow for substitution effects in production, consumption, and international trade. Second, there are no resource constraints on the adjustment. Third, the linear model derived from the SAM has no room for price effects and assumes that marginal and average coefficients are the same (fix-price models). As in the input-output framework, supply is infinitely elastic at the cost price and output is demand-determined. Assumptions about fixed coefficients and cost prices limit the applicability of all linear input-output

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[11] This is in line with the conclusion drawn by Rodrik (1994): research based on his political cost-benefit ratio (PCBR) confirms and illustrates the substantial distributional impact of trade policy reform (see section II.3.1).

and SAM-based models, static and dynamic. Under this logic, all firms that are aggregated under a given production activity should have the same production function with a unique technology and a similar distribution of factor income. This means that when defining production activities for the agricultural sector for instance, categories should be tailored along production systems, not commodity aggregates[12].

As for input-output tables, SAMs remain fundamentally applicable in contexts which are characteristic of fix-price models with excess production capacity and absence of substitution (Robinson, 1989). Consequently, it cannot serve to study shocks that involve important structural changes with major price adjustments such as real exchange rate movements, wage repression, or terms-of-trade effects, which are characteristic of major adjustments occurring in developing countries undergoing structural reforms (de Janvry and Sadoulet, 1995). SAM-based models are thus inherently limited in their ability to reflect the workings of a multi-market economy in which price adjustments play an important role and in which there are important substitution possibilities in both production and demand. What the SAM does however correctly portray is the interdependence between production and the primary and secondary distributions of income (Robinson, 1989). The only way to include structural changes and shifts in relative prices would be to elaborate on the information provided by a SAM in the framework of Computable General Equilibrium models (CGE).

In our Guatemalan case study, we have analysed tax policy in the framework of constant prices. Shifts have been dealt with as positive or negative income injections. In reality, an increase or reduction in a tax which directly relates to economic activity (e.g. VAT) is likely to bring about changes in prices. The solution would be to build a SAM-based CGE model which would combine the advantages of the SAM in terms of data with the inclusion of changes in relative prices. Provided the closure mechanisms and elasticity parameters in the different sectors are correctly identified, the tax shifting effects would then be properly determined by the model, instead of the ad hoc assumptions required for the simulations above. Yet our model may still be adequate for predicting the reactions of socioeconomic groups to different policy options. These are best explained under the assumption of limited rationality whereby each group is likely to

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[12] This is the case in our Guatemalan SAM, as shown in chapter V.

react on the basis of its anticipated gains or losses from economic reform. These anticipations are most likely to be generated without taking into account the impact of structural changes within the economy following fluctuations in relative prices.

The paucity of reliable data on war-torn economies remains a major impediment to detailed SAM-based analysis. But the possibility of building a social accounting matrix at the sub-national level opens the door for distributional studies at the municipal or village level, to the extent that it is easier to conduct a representative household survey at the micro level.

III.5.1   Contribution to the Analysis of War-torn Economies

In concluding a brief review on recent literature on war-torn economies (chapter II), we have highlighted several key issues which deserve increased attention in economic analysis. The first one – distributional analysis – has been the focus of this chapter. SAM-based modelling proves helpful in reconciling scarce and inconsistent data from different sources into a coherent framework and in assessing the distributional impact of several economic policy options. This is particularly important in the case of war-torn societies as politics often takes precedence over economic efficiency, at least in the short run. Yet the simulation outputs resulting from a SAM-based model do not say much per se about the political feasibility of economic reforms. The analysts have to deduct from the simulation results which household or institution category would gain or lose from a given policy change, and then make assumptions about the likely reactions that can be expected at the political level from these institutions.

Assumptions behind the potential impact of poverty and extreme inequality also derive from psychological theories on collective violence. The relative deprivation theory (Gurr, 1970) contends that invidious discrepancies in economic, social, and political values are the most important determinants of conflict. Large gaps between people's socioeconomic expectations and what they actually receive, and the perceived grievance or frustration resulting from such discrepancy, is a major cause for political mobilisation

and conflict[13]. This theory has particular implications for postconflict rebuilding. Internal conflict offers huge profit opportunities to a small minority while living conditions dramatically deteriorate for the vast majority. War therefore tends to increase income concentration and to widen the gap between rich and poor. Much is then at stake during the reconstruction phase:

- If aspirations and rising expectations are well in excess of achievements, the resulting frustration is a potentially strong destabilising factor. In the aftermath of a protracted conflict, losers have high expectations of rapid improvements once the peace is settled. If these expectations do not materialise, frustration breeds discontent and rekindles tensions.

- Winners (e.g. illegal traders, some government officials, operators on parallel markets) have benefited from quasi-rents generated by chronic macroeconomic disequilibria and supply shortages. These new economic elites emerging during the conflict are likely to exert a major influence on the postwar economy, but tend at the same time to perpetuate illegal activities and continue their racketeering behaviour. A basic question is whether it is sound to allow this kind of "investor" to play such a dominant role in the postconflict economy and, if not, how to curb their influence or bring them back into a formal/legal economy. Liberalisation measures tend to eliminate the rents from which powerful groups benefited during the war and who are thus likely to oppose such reforms and resist attempts to integrate into the formal economy.

- Other people such as elements of the old central army, warlords, demobilised soldiers, and politically disenfranchised forces are potentially destabilising groups in the postconflict period. They are likely to resort to violence if they fear they may "lose" from the peace deal, all the more so as they often have access to – or still possess – arms and ammunitions (Adekanye, 1997).

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[13] Other authors have suggested that studying the origins of expectations can help to understand the rationale for conflict: norms, social comparison processes, ideologies, etc. (Lichbach, 1989). Adelman and Robinson (1989) showed that opportunities for "exit" through international or rural-urban migration made greater inequality more tolerable, and that the same holds true if the richest groups refrain from ostentatious display of wealth differentials.

It is further interesting to add that the relation between social tensions and inequality may work in two ways, as highlighted by Sachs (1989) in the case of Latin American countries: high income inequality contributes to bad policy choices and weak economic performance via intense political pressures for macroeconomic policies to raise the incomes of lower income groups ("populist" policies). There is thus a vicious circle where unequal income and asset distribution fuel inequality via the whole process leading to economic policy design and implementation. In the same vein, Persson and Tabellini (1994) provide empirical evidence in a major survey of the literature on endogenous growth and endogenous policy that high concentration of land ownership tends to be associated with higher sectoral tax rates on the capital intensive sector, and thus lower growth rate. This conclusion is based on the following assumption: the small group of individuals (land owners in the above example) that disproportionately benefits from a policy that is unfavourable in terms of aggregate outputs (higher taxes on capital intensive sectors) is likely to be more organised and more successful in lobbying than the rest of the population. This phenomenon is relevant for many postwar countries in Latin America, including Guatemala.

In the following chapters, we explore how to better include the political dimension in economic analysis, over and above strict distributional analysis. The next chapter specifically deals with the political economy of peace-building and presents a framework to tackle the complex and crucial interactions between the political and economic spheres.

Annexe III.1: Copy of the original accounting table by Cruz and Serra
Guatemala – 1986 (Part 1)

ACCOUNTS	Productive sector								Intermediate demand
	1	2	3	4	5	6	7	8	
	PA-tr.ag	PA-hyb.	PA-back	PA-manuf	PA-manuf	PA-fuels	PA-servi	PA-commerce	
1 PA-Traditional agr X sec	5.5	0.0	0.0	382.3	9.3	0.0	0.0	0.0	397.0
2 PA-Hybrid agr sec	23.7	1.2	0.0	490.6	11.3	0.0	5.0	0.0	533.5
3 PA-Backward agr sec	152.7	98.9	98.9	63.3	1.6	0.0	0.0	0.0	416.0
4 PA-manuf 1	122.7	12.7	0.4	1287.0	31.3	28.4	429.1	127.5	2029.1
5 PA-manuf 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 PA-fuels	5.1	2.0	5.9	24.2	0.8	0.3	104.4	6.6	159.3
7 PA-services	21.9	34.1	21.5	599.9	14.6	15.2	442.8	583.1	1721.1
8 PA-Commerce	36.0	20.4	11.8	481.8	11.7	0.0	274.3	166.1	1002.1
9 Total domestic inputs	357.6	169.3	138.9	3339.0	81.2	43.9	1255.5	882.3	6268.1
9 M-Backward agr sec	3.6	1.2	10.5	86.2	2.1	0.0	0.0	0.0	103.6
10 M-From CACM	1.2	0.4	3.6	29.7	0.7	0.0	0.0	0.0	35.6
11 M-manufacturing	35.9	11.7	104.7	925.9	20.1	0.0	145.4	0.0	1143.6
12 M-From CACM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13 M-fuels	0.0	0.0	0.0	0.0	0.0	225.9	0.0	0.0	225.9
14 M-services	0.0	0.0	0.0	0.0	0.0	0.0	32.2	0.0	32.2
b Total imports	40.6	13.3	118.6	941.8	22.9	225.9	177.6	0.0	1540.9
c Gross value	3068.6	1296.5	843.9	6681.4	158.0	303.5	3843.7	4688.9	22924.9
d Value added at market price (c-b-a)	2670.4	1113.9	586.6	2399.6	53.3	33.7	4410.6	3806.6	15115.5
15 FP-wages rural workers	941.6	207.2	253.0	0.0	0.0	0.0	0.0	0.0	1400.4
16 FP-wages urban workers	0.0	0.0	0.0	859.4	20.9	17.9	0.0	0.0	898.2
17 FP-wages service workers	0.0	0.0	0.0	0.0	0.0	0.0	2511.7	1055.6	2567.3
e Total salaries	941.4	207.2	253.0	859.4	20.9	17.9	1521.7	1055.6	4865.9
g Gross capital payments (d-e)	1729.0	906.7	574.8	1540.4	33.0	15.8	2898.9	2751.0	10249.6
23 G-total taxes (excl corp tax)	205.7	12.4	17.5	99.7	1.1	7.3	239.8	588.4	1171.9
24 G-o/w total tariffs	2.2	0.9	5.5	48.9	0.0	0.6	11.1	67.7	136.1
25 G-o/w tariffs on capit goods	0.6	0.4	0.7	12.2	0.0	0.0	6.3	0.0	20.3
18 FP-net capital payments (g-22+26)	1523.9	894.7	358.0	3452.9	31.9	8.5	2665.6	2162.6	9087.9
19 FP-interest payments	37.2	50.2	0	120.5	2.8	1.8	-141	60.7	142.2
20 FP-depreciation	81.3	47.8	19.1	669.2	14.4	0	673.2	55.5	1560.5
21 FP-corporate tax	77.3	0.7	0	36.7	0	0	1.9	1.8	118.4
R Cashflow (18-19-21)	1405.4	843.8	358.0	1285.7	29.1	6.7	3804.5	2180.1	8937.3
22 FP-Reinvestment	39.7	52.2	19.1	638.7	14.5	1.9	479.6	72.5	1319.2
L Dividends (sum 26 to 30)	1406.3	844.0	338.8	784.4	14.7	6.7	2471.6	2090.6	7959.3
26 K-rural workers div	0.0	0.0	338.8	0.0	0.0	0.0	0.0	0.0	338.8
27 K-capitalists div	1392.5	896.2	0.0	761.3	14.0	1.9	2509.0	2153.7	7724.6
28 K-government & div	0.0	0.0	0.0	0.0	0.0	0.0	109.4	0.0	109.4
29 K-foreigners div	54.3	0.0	0.0	158.3	3.6	6.7	0.0	0.0	223.6
30 Transfers div	-28.7	-52.2	0.0	-135.7	-2.9	-3.0	-146.8	-63.3	-441.3
J Total disposable income (3+31)									
31 Savings									
k Consumption (a+b)									
TOTAL	3069	1297	984	6681	158	304	5844	4689	22925

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Annaxe III.1: Copy of the original accounting table by Cruz and Serra
Guatemala – 1986 (Part 2)

ACCOUNTS	Private consumption				Total	Investment				
	15	16	17	18	Consm.	CAPITAL		GVT	ROW	
	PP-rural	PP-urban	PP-ser w	PP-capital	Total	K-pr/inv	PP-pu/inv	PP-gov/in	S-external	Gross value
1 PA-Traditional exp X sec	127.0	94.1	307.4	507.0	2635.5	46.6	0.0	0.0	1547.8	3066.9
2 PA-hybrid agr sec	58.2	44.2	149.8	268.4	520.6	41.3	0.0	0.0	203.4	1296.8
3 PA-backward agr sec	140.8	33.5	127.1	151.5	452.9	15.2		0.0	0.0	884.1
4 PA-manuf 1	617.7	261.7	851.6	1691.1	3422.1	485.0		205.5	529.4	6681.1
5 PA-manuf 2	0.0	0.6	0.0	0.0	0.0	0.0		0.0	158.0	158.0
6 PA-fuels	4.9	3.4	11.8	55.3	76.4	0.0		0.0	65.8	303.5
7 PA-services	264.0	232.6	892.9	1821.0	3190.5	462.5	166.3	18.4	285.0	4843.8
8 PA-commerce	580.4	275.5	952.2	1078.2	3606.3	0.0	0.0	0.0	0.0	4688.4
a Total domestic inputs	1793.0	825.0	3292.6	6375.5	12386.3	1052.6	166.3	223.9	2827.4	22924.4
9 M-backward agr sec	2.5	0.6	2.2	2.7	8.0					211.6
10 M-from CACM	0.0	0.0	0.0	0.0	0.0					25.4
11 M-manufacturing	37.3	15.8	51.4	101.7	206.2	401.8	17.2			1760.0
12 M-from CACM	30.4	12.9	41.7	83.6	168.6					168.6
13 M-fuels	0.0	0.0	0.0	0.0	0.0					225.3
14 M-services	0.0	0.0	0.0	77.4	77.4			109.6	0.8	213.7
b Total imports	70.3	29.3	95.5	265.4	460.4	401.8	17.2	109.6	0.8	2529.9
c Gross value										22924.5
d Value added at market price (c-b-a)										15115.5
15 PP-wages rural workers										1400.4
16 PP-wages urban workers										898.2
17 PP-wages service workers								788.0		3356.2
e Total salaries	1400.4	898.2	3356.1	0.0	5654.8	0.0	0.0	788.0		21309.5
g Gross capital payments (d-e)										10249.6
23 g-total taxes (excl corp tax)	0.0	0.0	0.0	214.4	214.4					1385.1
24 G-o/w total tariffs										136.1
25 G-o/w tariffs on capit goods										20.3
18 PP-net capital payments (g-23+25)	0	0	0	0	0	0	0	0	0	9097.9
19 PP-interest payments	0	4.3	7.8	125.5	136.9	0	0	430.8	448.2	1147.2
20 PP-depreciation	0	0	0	0	0	0	0	0	0	1560.2
21 PP-corporate tax	0	0	0	0	0	0	0	0	0	118.4
h Cashflow (18-19-21)	338.0	0	0	7728.6	8067.3	0	0	0	0	16904.6
22 PP-Reinvestment		0	0	0	0	0	0	0	0	1929.2
i Dividends (sum 26 to 30)										7955.2
26 K-rural workers div										338.8
27 K-capitalists div										7728.6
28 K-government 1 div										109.4
29 K-foreigners div										223.6
30 Transfers div	-123.9	-92.9	-92.9	0.0	-309.7			563.7	181.3	0.0
j Total disposable income (k+31)	1863.2	995.3	3456.1	7639.7	13954.3					13954.3
31 Savings	0.0	41.0	67.8	998.8	1107.6					1107.6
k Consumption (e+b)	1863.2	954.3	3388.3	6640.9	12846.7					12846.7
TOTAL	3264	1853	6744	6841	18502	1454	184	1122	2827	47016

Annexe III.1.2: Explanation regarding tha tabla by Cruz and Serra

N.b.: Accounts in italics are totals or sub-totals of other accounts. Small letters and account numbers are used to indicate how each of these accounts is calculated.

ACRONYMS

PA:	Production activities
FP:	Factor of production
M:	Imports
G:	Government
K:	Capital
E:	Exports

CACM: Central American Common Market (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua)

Corp. tax:	Corporate tax
Div:	Dividends
ROW:	Rest of the world
C:	Consumption
Int. demand:	Intermediate demand

Annexe III.2: Proposed structure for the Guatemalen SAM

ACCOUNTS		PA	FP	HH	Firms	IT	DT	Gvt	S/I	ROW	Total
Production Activities (PA)	Agriculture / Industry / Services	Intermediate demand		Final or private consumption				Government expenditure	Capital formation (investment)	Exports	Total Demand
Factors of production (FP)	Labour / Capital	Value added at factor cost (payments to factors)						Gvt wages		Net factor income from abroad	Domestic factor income
Households (HH)	Rural, urban, inv. income, Empl. income RR		Allocation of factor income to HH	Transfers between HH	Profits distributed to HH			Gvt transfers to HH		Net non-factor income from abroad	Incomes of domestic institutions after transfers
Firms		Net II	Allocation of operating surplus to firms	HH payments to firms	Profits distributed to HH			Current Gvt transfers to domestic firms			
Indirect taxes (IT)				Direct taxes on HH	Direct taxes on firms	Net IT					Net IT
Direct taxes (DT)						Total direct taxes					DT
Government (Gvt)			Depreciation	HH savings	Undistributed profit after tax (firm s)	Net IT	Net DT	Gvt current account surplus (Gvt S)	Current transfers from abroad	Rev. foreign claims on domestic HH (Gvt transfers abroad)	Gvt
Capital accounts (S)	Capital payments (K) / Savings (S) / Gvt	Imports (M)	Income paid abroad	HH equivalents to abroad				Gvt current transfers abroad		Current deficit in RoW	Savings
ROW		Total supply	Factor payments	HH outlay	Firm outlay	Net IT	DT	Gvt outlay	Investment	K and income from abroad	Payments abroad

Annexe III.3: Adjustment snd corrections to construct the Guatemalsn SAM

The main operations in building our SAM are the following:
Some of the accounts in the accounting tables by Cruz and Serra are reorganised and corrected as follows:

Value added at market prices - wages = gross capital receipts (or operating surplus at market cost);

all taxes = operating surplus or value added at factor cost;

depreciation = net operating surplus at factor cost;

reinvested utilities or nondistributed profits = distributed profits or dividends.

Depreciation is then reported under the private capital account in the SAM.

The private capital account is taken as a residual. We add to the amount of investment allocated to each and every sector in order to balance rows with columns based on the usual assumption that private investment is poorly recorded and often underestimated.

We reproduce below the most relevant balance sheets provided by Cruz and Serra, which we use to cross-check the information provided on the accounting table (annexe III.1) and correct the data where necessary. For a complete presentation of the balance sheets and national accounts, the reader is referred to the tables 20 to 32 in Cruz and Serra (1989).

Government - Current Account (million qtz, 1986)

Revenues	Origin of payment		Expenditures	
Tax revenue		1,327.8	Current expenditure	1,519.2
Central government		1,114.2	Consumption (goods + services)	339.5
Value added	Productive sector	308.3	Government consumption	278.1
Imports tariffs	Productive sector	136.1	Services	89.2
Export	Productive sector	245.5	Goods	188.9
Excise (consumption tax)	Commerce sector	138.8	Rest of govt consumption	55.4
Stamp tax + others	Service + commerce	89.3	Services	40.2
Personal income	Households	51.2	Goods	15.2
Property	Households	16.4	Wages + salaries	788.8
Vehicle	Households	10.1	Central government	624.8
Corporate tax	Productive sector	118.5	Rest of government	164.0
Rest of government		213.6	Interest	211.1
Households	Households	100.0	Central government interest	207.9
Enterprises	Service + commerce	113.6	External debt	27.7
Non tax revenue		309.2	Internal debt	180.3
Central government		272.5	Rest of Central govt interest	3.2
Net transfers public enterprise	Public enterprise	28.9	Net private transfers	185.8
Petroleum compensation fund		133.3	Capital expenditure	239.2
Rents	Services	31.1	Fixed capital formation	183.5
Others	Services	79.2	Non-financial public enterprise	44.8
Rest of government	Households	36.7	Financial intermediaries	10.9
Grants	External Sector	57.4		
Total		1,694.4	Total	1,758.4
Deficit		64.0		

Guatemala : Balance of payments 1986

	(million Quetzales)
CURRENT ACCOUNT	**-118.0**
Trade balance	405.0
Net factor receipts	-507.9
Official interest	-400.4
Government	-59.8
Public enterprise	-88.7
Bank of Guatemala	-121.5
Public banks	-9.4
Other	121.0
Private interest	-9.8
Dividends Nondistr. Ut	-27.7
Other	-69.9
Non factorial services	-139.1
Transport + insurances	-215.2
Other services	42.5
Tourism	33.6
Net private transfers	123.9
CAPITAL ACCOUNT	**266.3**
Private capitals	140.5
Foreign investment	165.8
Other private capitals	-25.3
Government	199.1
Grants	57.4
Foreign financing	141.7
Public enterprises	20.5
Net capitals to Bank of Guatemala	-7.5
Short term	-13.7
Medium- and long-term	-123.2
Arrears of Bank of Guatemala	129.4
FMI	-109.7
Other banks	23.4
Overall deficit	148.3
Net deficit of FMI	38.6
Memo:	83.1
Total arrears (interests)	
Corfina	44.1
Public sector	33.0

General Government (Million Qtz, 1986)

	Sources	Uses	
Taxes	1,325.0	766.8	Wages + salaries
Non tax income	280.2	333.5	Goods + services
From households	36.7	243.2	Interest payments
From enterprises	243.5	59.8	External public debt
Utilities public enterprise	26.9	183.5	Internal public debt
Transfers from abroad	57.4	241.5	Transfers productive sector
Overall deficit	99.1	185.9	Households
External new net indebtedness	141.7	55.7	Public enterprises (Capital)
Loans from fin. intermediaries	203.9	183.5	Fixed capital formation
Loans Guatemala Bank	(170.6)		
Change in floating debt	146.9		
Other loans	(26.2)		
Bonds	(196.7)		
Households	28.0		
Financial intermediaries	172.9		
Public entities	0.0		
Bank of Guatemala	(397.6)		
	1,790.5	1,790.5	

Central Bank (Million Qtz, 1986)

	Sources	Uses	
New external net indebtedness	(117.1)	312.4	Interest external debt
		(556.2)	New credit to government
Money supply (currency)	106.4	(61.2)	Credit public enterprises
Change in bank reserves	167.3	0.8	Credit financial system
Interest government debt	90.9	148.3	Change international reserves
Interest financial system	25.9	441.3	Unclassified assets
	273.4	273.4	

Households (Million Qtz, 1986)

	Sources	Uses	
Wages + salaries from enterprises	4842.8	12,846.7	Private consumption
Government wages + salaries	788.8	673.1	Taxes to families
Transfers	309.7	748.7	New deposits
From abroad	123.9	94.2	Change money supply (currency)
From government	185.8	111.4	Securities capital + reserves
Interest from bonds	4.3	26.0	Central Government bonds
Net interest from deposits	132.6		
Dividends from enterprises	9,414.5		
Consumer credit	9.4		
	14,502.0	14,502.1	

Enterprises (Million Qtz, 1986)

	Sources	Uses	
GDP Non government sector	15,049.1	4,842.8	Wages + salaries to household
New external indebtedness	(4.8)	424.4	Total interest payments
New banks indebtedness	238.1	369.3	To banking system
New Bank of Guatemala indebt.	(61.2)	0.0	To Bank of Guatemala
Securities capital + reserve	111.4	55.1	To external creditors
Capital transfers from government	55.7	657.0	Taxes to enterprises
Foreign investment	165.8	27.7	Utilities external investment
Unclassified assets	441.3	9,414.5	Dividends to households
		28.9	Utilities Public enterprises
		1,453.0	Private investment
		146.9	Change in floating debt
	15,995.3	15,995.2	

Banking system (Million Qtz, 1986)

	Sources	Uses	
Change in deposits	746.7	19.2	Interest external debt
New external indebtedness	23.4	26.9	Interest Bank of Guatemala debt
Interest debt private sector	369.3	132.8	Interest payments from deposits
Interest debt public sector	88.3	167.3	Change in banking reserves
Credit from Bank of Guatemala	0.8	247.5	Net loans to private sector
		9.4	Consumer credit
		238.1	Corporate credit
		350.6	Net loans to public sector
		12.2	Change cash in vault
		275.2	Taxes
	1,230.5	1,230.5	

Based on the above, we correct data for households as follows: net interests from deposits are split between high income households (HHH) which receive 125.5 million Quetzales (qtz) (+7728.5=7854) and middle-income urban households (MHH) which get qtz 7.1m.

Government transfers are divided between MHH and low-income urban households (LUHH) which receive an additional qtz 4.3m in interests (+92.9=97.2). Transfers from abroad correspond to capital and labour income from abroad. The qtz 123.9m accruing to low-income rural HH (LRHH) primarily register remittances sent from relatives working abroad.

We add an account "other institutions" which comprises productive entities. The qtz 111.4m receipts by other institutions correspond to equity shares acquired by HHH.

The government gets qtz 214.4m from HHH as direct taxes, and qtz 57.4m as grants and credits from abroad. Net transfers from public enterprises amount to qtz 28.9m, rents to qtz 31.1m and other nontax revenues to qtz 79.2m (=qtz 109.4m). The government deficit is qtz 99.1m (reported in the SAM as negative savings).

As for the rest-of-the-world account – which includes capital transfer from abroad and current deficit in the balance of payments – the figures are corrected based on the balance sheets as follows: capital payment abroad

actually amounts to qtz 233.4m which corresponds to qtz 223.6m + qtz 4.3m and 5.5m as interest payments by the government.

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Annexe III.4: SAM Guatemala (1986) with detailed tax accounts

Adapted to the structure in Annexe III.2

Annexa III.5: SAM Guatemala (1986), million Quetzales 1986

Numbering corresponds to account numbers in the SAM (annexe III.5)

ANNEXE III.5: SAM GUATEMALA 1986, MILLION QUEZALES 1986

Annexe III.5.1: Description of the SAM Accounts

Numbering corresponds to account numbers in the SAM (annexe III.5)

1. Traditional agricultural exports: coffee, cotton, banana, sugar cane, meat.

2. Nontraditional agricultural exports: tomato, other agricultural production, forestry and fishing.

3. Subsistence agriculture: corn, beans and wheat.

4. Manufacturing 1: mining, food processing, industry, handicraft.

5. Manufacturing 2: industrial goods that are wholly exported, such as textiles in export processing zones.

6. Oil and lubricants

7. Services: covers all services including construction, energy, communications, transport,
   banking and insurances (financial services), tourism and other private services.

8. Commerce: commercial activities.

9. Rural labour

10. Urban labour

11. Service labour

12. Capital (includes dividends, interests and nondistributed profits from land and capital).

13. Low-income rural households: rural households earning up to qtz 1,200, associated with rural labour.

14. Low-income urban households: urban households earning between qtz 1,201 and 2,400, associated with urban (industry) workers.

15. Medium-income urban households: urban households earning between qtz 2,400 and 2,401 and 4,800, associated with labour in the services sector.

16. High-income households: households earning more than qtz 4,800, associated with capital.

17. Other institutions: firms.

18. Customs tariffs: only on imported goods.

19. Value added tax.

20. Other indirect taxes: comprises export tariffs and excise tax.

21. Direct taxes: includes income tax, property tax, corporate tax and tax on vehicles.

22. Government: includes nontax revenue such as net transfers from public enterprises, petroleum compensation fund by the private sector, rents and other.

23. Consolidated capital account: column-wise includes capital formation (public and private investment), and row-wise depreciation allowances, savings of institutions and net capital transfers from abroad.

24. Rest-of-the-world (ROW) current account: this includes export, respectively imports; factor income from (resp. to) abroad, current transfer of institutions to (respectively from) abroad.

25. Rest-of-the-world (ROW) capital account: includes capital transfer from abroad and current deficit in the balance of payments.

Annex III.6 (Table 1) – matrix average propeneilies

ANNEXE III.6 - TABLE 1: INCOME SHARE OF ENDOGENOUS AND EXOGENOUS ACCOUNTS

Annex III.6 (cont.) - Table 2: matrix of average propensities - endogenous eccounts

ANNEXE III.6 - TABLE 2: MATRIX OF AVERAGE PROPENSITIES - ENDOGENOUS ACCOUNTS: MATRIX A

endogenous	1 PA-trad agr sec	2 PA-o[a/c]/yd	3 PA-hybrid agr	4 PA-unit 1	5 PA-unit 2	6 PA-xtra	7 PA-services	8 PA-commerce	9 FP-rural work	10 FP-urban work	11 FP-serv work	12 FP-capital pay	13 HH-rural	14 HH-urban L	15 HH-urban M	16 HH-income	17 O-firms
1- PA-Traditional agr sec	0.0018	0.0000	0.0000	0.1228	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0408	0.0302	0.0368	0.1629	0.0000
2- PA-Hybrid agr sec	0.0170	0.0009	0.0000	0.3515	0.0065	0.0000	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417	0.0317	0.1073	0.1922	0.0000
3- PA-Backward agr sec	0.1680	0.1095	0.1095	0.0707	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1568	0.0371	0.1407	0.1977	0.0000
4- PA-urual 1	0.0164	0.0017	0.0001	0.1724	0.0042	0.0038	0.0575	0.0171	0.0000	0.0000	0.0000	0.0000	0.0528	0.0351	0.1141	0.2266	0.0000
5- PA-urual 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6- PA-Axis	0.0167	0.0085	0.0198	0.1120	0.0236	0.0010	0.3416	0.0216	0.0000	0.0000	0.0000	0.0000	0.0160	0.0111	0.0355	0.1899	0.0000
7- PA-services	0.0010	0.0051	0.0032	0.0990	0.0022	0.0028	0.0663	0.0673	0.0000	0.0000	0.0000	0.0000	0.0896	0.0019	0.1389	0.2731	0.0000
8- PA-commerce	0.0075	0.0042	0.0025	0.1005	0.0024	0.0000	0.0571	0.0346	0.0000	0.0000	0.0000	0.0000	0.1208	0.0573	0.1981	0.3908	0.0000
9- FP-wages rural workers	0.6722	0.1480	0.1738	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10- FP-wages urban workers	0.0000	0.0000	0.0000	0.8566	0.0233	0.0189	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11- FP-wages service workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4504	0.3145	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12- capital payment	0.1405	0.0916	0.0330	0.2066	0.0043	0.0011	0.3176	0.2051	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13- LHH-rural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7617	0.0000	0.0000	0.1818	0.0000	0.0000	0.0000	0.0000	0.0000
14- LHH-Urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9024	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15- MHH-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9711	0.0031	0.0000	0.0000	0.0000	0.0000	0.0000
16- HH-bottom	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17- O-firms	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7921	0.0000	0.0000	0.0000	0.0689	0.0000

Annex III.6 (cont.) - Table 3: matrix of averaga propensities – exogenous accounts

ANNEXE III.6 - TABLE 3: MATRIX OF AVERAGE PROPENSITIES - EXOGENOUS ACCOUNTS: MATRIX B

exogenous	PA-Aex act	PA-agric ele	PA-back ser	PA-manuf 1	PA-manuf 2	PA-infras	PA-services	PA-commerce	PA-communic	PP-rural work	Fa-urban work	PP-Aex work	HH-capitalists	HH-rural	HH-urban	HH-transfers	HH-income	Others
24-Customs tariffs	0.0162	0.0088	0.0411	0.3627	0.0000	0.0044	0.0818	0.4974	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Value added tax	0.0000	0.0071	0.0273	0.0000	0.0000	0.0000	0.0000	0.9601	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-other indirect taxes	0.2797	0.0128	0.0048	0.0711	0.0015	0.0069	0.3143	0.3090	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21-Direct taxes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8442	0.3558
22-Government	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0656	0.0000	0.0000	0.0000	0.0000	0.0176
23-Capital account	-0.0108	-0.0145	0.0000	-0.0378	-0.0008	-0.0005	-0.0409	-0.0176	0.0000	0.0000	0.0000	0.4343	0.0000	0.0114	0.0185	0.2486	0.2979
24-ROW current (imports)	0.0124	0.0041	0.0303	0.2860	0.0070	0.0691	0.0549	0.0000	0.0000	0.0000	0.0000	0.0714	0.0000	0.0214	0.0092	0.0781	0.1370
25-ROW capital	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Annex III.6 (cont.) – Table 4: aggregate multiplier matrix

ANNEXE III.6 – TABLE 4: AGGREGATE MULTIPLIER MATRIX: M = INVERSE(I–A)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1	1.1740	0.0782	0.0450	0.8292	0.0120	0.0049	0.3742	0.2529	0.1095	0.0787	0.2606	0.5678	0.1467	0.0659	0.2690	0.8308	0.0000	4.5212
2	0.2769	1.1149	0.0670	0.9622	0.0228	0.0060	0.5692	0.3779	0.1625	0.1061	0.4055	0.6836	0.2162	0.1198	0.4176	0.7935	0.0000	6.4865
3	0.5469	0.2479	1.2178	0.8112	0.0191	0.0082	0.6473	0.4390	0.2775	0.1904	0.5057	0.8470	0.3592	0.1449	0.6208	0.6788	0.0000	7.7333
4	0.2956	0.1381	0.0736	1.7718	0.0192	0.0118	0.6293	0.4048	0.1874	0.1093	0.4077	0.8641	0.2493	0.1211	0.4199	0.8179	0.0000	6.5045
5	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
6	0.2750	0.1291	0.0698	0.7314	0.0170	1.0086	0.3903	0.4340	0.1478	0.0898	0.3757	0.9037	0.1957	0.1072	0.3869	0.8571	0.0000	6.7006
7	0.2780	0.1319	0.0761	0.7184	0.0168	0.0098	1.5917	0.5146	0.1634	0.1120	0.4498	0.9917	0.2174	0.1241	0.4632	0.9112	0.0000	8.6302
8	0.4002	0.1776	0.1064	0.3289	0.0218	0.0100	0.8713	1.0900	0.2533	0.1663	0.5937	1.2822	0.3457	0.1732	0.6114	1.1685	0.0000	8.5612
9	0.5269	0.2643	0.2691	0.6303	0.0149	0.0098	0.4523	0.3045	1.1475	0.0903	0.3596	0.6596	0.1963	0.1051	0.3497	0.6322	0.0000	6.5051
10	0.2867	0.1203	0.0722	1.7093	0.0410	0.0099	0.5206	0.3960	0.1822	1.1056	0.3976	0.6447	0.2424	0.1120	0.4094	0.7996	0.0000	7.3808
11	0.2511	0.1153	0.0677	0.6148	0.0144	0.0076	1.0061	0.7321	0.1549	0.0996	1.3693	0.8225	0.2050	0.1104	0.4009	0.7842	0.0000	6.8070
12	0.4405	0.2296	0.1190	0.9715	0.0223	0.0103	0.9795	0.6585	0.1832	0.1152	0.4428	1.9247	0.2438	0.1276	0.4558	0.8796	0.0000	7.7663
13	0.7792	0.2997	0.1156	0.6506	0.0162	0.0093	0.5189	0.3486	0.8509	0.0699	0.3357	0.8529	1.1919	0.0985	0.3457	0.6951	0.0000	7.2156
14	0.2605	0.1096	0.0592	1.5429	0.0370	0.0279	0.5600	0.3574	0.1644	0.9994	0.3698	0.7633	0.2189	1.1085	0.3594	0.7217	0.0000	7.5598
15	0.2449	0.1124	0.0666	0.5990	0.0140	0.0074	1.0061	0.7123	0.1606	0.0970	1.8500	0.8027	0.2006	0.1075	1.3903	0.7683	0.0000	7.6621
16	0.4409	0.2256	0.1189	0.9715	0.0223	0.0103	0.9795	0.6585	0.1832	0.1152	0.4428	1.9247	0.2438	0.1276	0.4558	1.8796	0.0000	8.7665
17	0.3752	0.1938	0.0979	0.3845	0.0191	0.0068	0.8962	0.6658	0.1574	0.0968	0.3902	1.6583	0.2094	0.1096	0.3815	0.8228	1.0000	7.7547
Total	7.8680	3.5363	2.7472	14.9652	1.3276	1.1785	12.6909	8.7478	4.3260	3.5866	8.4533	16.5683	4.5911	2.9788	7.6773	13.9054	1.0000	115.5841

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Annex III.6 (cont.) - Table 5: leakage multiplier metrix

ANNEXE III.6 - TABLE 5: LEAKAGE MULTIPLIER MATRIX

endogenous	PA-transp	PA-sup p/y	PA-stock etc	PA-animal 1	PA-animal 2	PA-fruits	PA-own+horse	PA-ctt-commerce	PF-rural work	PF-urban work	PF-prof work	PF-capital/lab	MI+HH1	MI+HH2	MI+HH3	MI+HH4	HH-income	OTHER
18-Customs tariffs	0.0631	0.0322	0.0462	0.2195	0.2334	0.3472	0.1068	0.0895	0.0000	0.0000	0.0000	0.0000	0.3365	0.3212	0.3416	0.3162	0.3119	0.0000
18-Value added tax	0.0358	0.0534	0.0547	0.1362	0.1440	0.0001	0.0869	0.0816	0.0000	0.0000	0.0000	0.0000	0.3523	0.3416	0.3446	0.3388	0.3329	0.0000
20-other indirect taxes	0.0241	0.0276	0.0426	0.1578	0.1671	0.2096	0.0839	0.1244	0.0000	0.0000	0.0000	0.0000	0.2163	0.2540	0.2163	0.2968	0.2610	0.0000
21-Direct taxes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6349	0.0000	0.0000	0.0000	0.0000	0.0073	0.0000
22-Government	0.0882	0.1043	0.0978	0.0457	0.0416	0.0253	0.0796	0.0797	0.0000	0.0000	0.0000	0.0027	0.0027	0.0000	0.0000	0.0000	0.0004	0.0000
22-Capital account	0.6349	0.6769	0.6333	0.2711	0.2428	0.1125	0.5064	0.5041	0.0000	0.5863	0.3919	0.2704	-0.0392	-0.0322	-0.0392	-0.0335	-0.0271	0.0000
23-ROW current (imports)	0.1439	0.1256	0.1254	0.1696	0.1723	0.3064	0.1363	0.1207	1.0000	0.4407	0.6081	0.0921	0.1282	0.1153	0.1282	0.1119	0.1137	0.0000
24-ROW capital	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000

Annex III.6 (cont.) - Table 6: direct effects or intra-group matrix

ANNEXE III.6 - TABLE 6: DIRECT EFFECTS (INTRA-GROUP): MATRIX M1 = INVERSE(I-A0)

endogènes	1 PA-trad agr sec	2 PA-byw agr sec	3 PA-back agr	4 PA-manuf 1	5 PA-manuf 2	6 PA-trade	7 PA-services	8 PA-commerce	9 FP-rural work	10 FP-urban work	11 FP-ag work	12 FP-capitalists	13 LHH-rural	14 LHH-urban	15 MHH-urban	16 HHH-urban	17 OI-Firms
1-PA-Traditional agr sec	1.0043	0.0006	0.0001	0.1598	0.0097	0.0008	0.0097	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-PA-Hybrid agr sec	0.0244	1.0018	0.0002	0.4342	0.0105	0.0017	0.0325	0.0107	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-PA-Backward agr sec	0.1952	0.1234	1.1230	0.1793	0.0344	0.0007	0.0121	0.0043	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4-PA-manuf 1	0.0208	0.0027	0.0006	1.2254	0.0006	0.0048	0.0789	0.0289	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5-PA-manuf 2	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6-PA-trade	-0.0253	0.0117	0.0233	0.1953	0.0046	1.0026	0.3828	0.0605	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7-PA-services	0.0028	0.0067	0.0043	0.1848	0.0033	0.0030	1.0685	0.1007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8-PA-commerce	0.0199	0.0054	0.0032	0.1385	0.0034	0.0007	0.0727	1.0448	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9-FP-wages rural workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10-FP-wages urban workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11-FP-wages service workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12-capital payments	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13-LHH-rural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
14-LHH-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
15-MHH-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
16-HHH-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000
16-HH-income	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000
17-OI-firms	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0599	1.0000

Annex III.6 (cont.) - Table 7: own indirect effects or extra-group mix

ANNEXE III.6 – TABLE 7: OWN INDIRECT EFFECTS (EXTRA-GROUP): MATRIX M2 = (I+A*+A*^2)

endogenous	1 PA-tra agr	2 PA-oth agr	3 PA-back dip agr	4 PA-animal 1	5 PA-animal 2	6 PA-Artele	7 PA-services	8 PA-commerce	9 PP-rural work	10 PP-urban work	11 PP-ser work	12 PP-capital pa	13 LNH-rural	14 LNH-urban	15 MNH-urban	16 HH-income	17 nothing-10
1-PA-Traditional agr sec	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0408	0.0327	0.1151	0.2121	0.0543	0.0562	0.1185	0.2020	0.0000
2-PA-Hybrid agr sec	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0611	0.0445	0.1612	0.3235	0.0819	0.0493	0.1680	0.3083	0.0000
3-PA-Backward agr sec	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1533	0.0527	0.2073	0.3271	0.2039	0.0584	0.2134	0.2895	0.0000
4-PA-animal 1	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0820	0.0432	0.1641	0.3356	0.1081	0.0479	0.1567	0.3154	0.0000
5-PA-animal 2	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6-PA-Artele	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0450	0.0382	0.1275	0.3853	0.0869	0.0357	0.1313	0.3741	0.0000
7-PA-services	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0508	0.0413	0.1775	0.3888	0.0878	0.0457	0.1829	0.3708	0.0000
8-PA-commerce	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.1065	0.0611	0.2279	0.4894	0.1417	0.0677	0.2347	0.4631	0.0000
9-PP-wages rural workers	0.5722	0.1460	0.1799	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0852	0.0421	0.1426	0.2335	0.0000
10-PP-wages urban workers	0.0000	0.0000	0.0000	0.8968	0.0263	0.0199	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.1095	0.0468	0.1545	0.3092	0.0000
11-PP-wages service workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4504	0.3145	0.0000	0.0000	1.0000	0.0000	0.0750	0.0419	0.1582	0.3124	0.0000
12-capital payments	0.1405	0.0616	0.0390	0.2069	0.0043	0.0011	0.3178	0.2051	0.0000	0.0000	0.0000	1.0000	0.0650	0.0499	0.1751	0.3444	0.0000
13-LNH-rural	0.5908	0.1279	0.1412	0.0376	0.0003	0.0092	0.0579	0.0373	0.7517	0.0000	0.0000	0.1818	1.0000	0.0000	0.1751	0.0000	0.0000
14-LNH-urban	0.0000	0.0000	0.0000	0.8824	0.0210	0.8180	0.0000	0.0000	0.5000	0.9024	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
15-MNH-urban	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000	0.4931	0.3059	0.0000	0.0000	0.9711	0.0021	0.0000	0.0000	0.0000	0.0000	0.0000
16-HH-Income	0.1405	0.0916	0.0330	0.2066	0.0048	0.0011	0.3178	0.2051	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000	0.0000
17-Others	0.1207	0.0767	0.0284	0.1774	0.0037	0.0009	0.2730	0.1761	0.0000	0.0000	0.0000	0.8590	0.0000	0.0000	0.0000	0.0000	1.0000

Annex III.6 (cont.) - Table 8: cross-effects matrix

ANNEXE III.6 - TABLE 8: CROSS EFFECTS: MATRIX M3 = INV(I-A^^3)

endogenous	1 PA-tradit agr sec	2 PA-back agr sec	3 PA-back agr sec	4 PA-retail 1	5 PA-retail 2	6 PA-Fu-Fu	7 PA-services	8 PA-commerce	9 PA-rural work	10 PP-urban work	11 PP-ser work	12 PP-capitalists	13 LHH-rural	14 LHH-urban	15 MHH-urban	16 HH-income	17 c-time
1-PA-Traditional agr sec	1.1520	0.0673	0.0381	0.1877	0.0442	0.0021	5.3037	0.2027	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-PA-hybrid agr sec	0.2264	1.1004	0.0567	0.2756	0.0651	0.0031	0.4475	0.2855	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-PA-Backward agr sec	0.3196	0.1276	1.0812	0.3204	0.0071	0.0036	0.5288	0.3533	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4-PA-retail 1	0.2474	0.1059	0.0622	1.2830	0.0083	0.0031	0.4563	0.3054	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5-PA-retail 2	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6-PA-hats	0.2264	0.1047	0.0564	0.2793	0.0082	1.0029	0.4565	0.3035	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7-PA-services	0.2436	0.1114	0.0608	0.3038	0.0097	0.0033	1.5050	0.3366	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8-PA-commerce	0.3496	0.1529	0.0678	0.4082	0.0090	0.0045	0.8634	1.4485	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9-PP-regional workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1475	0.0903	0.3396	0.6698	0.0000	0.0000	0.0000	0.0000	0.0000
10-PP-wage urban workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1822	1.1065	0.3976	0.8447	0.0000	0.0000	0.0000	0.0000	0.0000
11-PP-wage service workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1549	0.0896	1.3693	0.8225	0.0000	0.0000	0.0000	0.0000	0.0000
12-capital payments	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1892	0.1162	0.4426	1.9247	0.0000	0.0000	0.0000	0.0000	0.0000
13-LHH-rural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1919	0.0965	0.3457	0.6351	0.0000
14-LHH-Urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2188	1.1085	0.3694	0.7217	0.0000
15-MHH-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2009	0.1075	1.3903	0.7634	0.0000
16-HH-income	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2439	0.1276	0.4556	1.8785	0.0000
17-c-time	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2094	0.1098	0.3915	0.7534	1.0000

Annex III.6 (cont.) - Table 9: transfer multiplier effects matrix

ANNEXE III.6 - TABLE 9: TRANSFER MULTIPLIER EFFECTS: Matrix T = M1-1

endogenous	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	mpl
1-F-Traditional agri sec	0.0043	0.0009	0.0001	0.1608	0.0037	0.0006	0.0097	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1730
2-F-Hybrid agri sec	0.0244	0.0016	0.0000	0.4342	0.0105	0.0017	0.0325	0.0107	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5161
3-F-Modern agri sec	0.1592	0.1234	0.1230	0.1793	0.0044	0.0007	0.0121	0.0043	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6424
3-F-Nawari 1	0.0936	0.0027	0.0000	0.2254	0.0048	0.0048	0.0780	0.0286	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5876
3-F-Nawari 2	0.0000	0.0000	0.0000	0.1969	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
4-F-fade	0.0259	0.0117	0.0233	0.1346	0.0048	0.0026	0.3823	0.0605	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7069
7-F-services	0.0056	0.0067	0.0043	0.1388	0.0036	0.0032	0.0965	0.1007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3451
8-F-commerce	0.0109	0.0000	0.0032	0.1388	0.0094	0.0007	0.0727	0.0446	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2796
9-F-regional rural workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10-FF-wages urban workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11-FF-wages service workers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12-capital payments	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9-Urb-rural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EP-Urb-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6-Mini-urban	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16-Mini-bonsu	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vn th-time	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0669	0.0669	0.0000	0.0669
Total	0.2957	0.1521	0.1546	1.4565	0.0534	0.0142	0.8754	0.2635	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0669	0.0669	0.0000	4.0972

Annex III.6 (cont.) - Table 10: open-loop multiplier effecta matrix

ANNEXE III.6 - TABLE 10: OPEN LOOP MULTIPLIER EFFECTS. Matrix O = (M2-I)*M1

category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1-PA-Traditional agr sec	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0408	0.0327	0.1191	0.2121	0.0843	0.0362	0.1185	0.2620	0.0000	0.8117
2-PA-Hybrid agr sec	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0811	0.0445	0.1612	0.3235	0.0613	0.0493	0.1690	0.3083	0.0000	1.1953
3-PA-Backyard agr sec	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1539	0.0627	0.2073	0.3271	0.2039	0.0584	0.2134	0.2865	0.0000	1.5056
4-PA-canal 1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0820	0.0432	0.1541	0.3356	0.1091	0.0479	0.1567	0.3154	0.0000	1.2482
5-PA-canal 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000
6-PA-trade	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0322	0.1275	0.3853	0.0589	0.0387	0.1313	0.3741	0.0000	1.1509
7-PA-services	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0508	0.0413	0.1776	0.3928	0.0676	0.0457	0.1628	0.3702	0.0000	1.3187
8-PA-commerce	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1095	0.0811	0.2279	0.4894	0.1417	0.0677	0.2347	0.4631	0.0000	1.7922
9-PA-wages rural workers	0.7189	0.1709	0.2020	0.1978	0.0048	0.0008	0.0135	0.0047	0.0000	0.0000	0.0000	0.0000	0.0852	0.0421	0.1426	0.3385	0.0000	1.8116
10-PA-wages urban workers	0.0204	0.0028	0.0010	1.1763	0.0350	0.0246	0.0590	0.0289	0.0000	0.0000	0.0000	0.0000	0.1066	0.0466	0.1645	0.3962	0.0000	1.9817
11-PA-wages service workers	0.0060	0.0047	0.0029	0.1044	0.0025	0.0016	0.5123	0.3740	0.0000	0.0000	0.0000	0.0000	0.0750	0.0419	0.1562	0.3124	0.0000	1.5839
12-capital private	0.1562	0.0697	0.0392	0.3915	0.0089	0.0094	0.3817	0.2526	0.0000	0.0000	0.0000	0.1819	0.0950	0.0466	0.1781	0.3444	0.0000	2.0039
13-Urban	0.6653	0.1464	0.1590	0.2193	0.0052	0.0012	0.0796	0.0497	0.7517	0.0000	0.0000	0.1819	0.0000	0.0000	0.0000	0.0000	0.0000	2.1559
13-Urban	0.0184	0.0025	0.0009	1.0516	0.0259	0.0222	0.0751	0.0061	0.0000	0.9024	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.1348
15-MH urban	0.0062	0.0048	0.0009	0.1021	0.0025	0.0015	0.4942	0.3637	0.0091	0.0000	0.9711	0.0021	0.0000	0.0000	0.0000	0.0000	0.0000	1.9851
16-MH rural	0.1562	0.0397	0.0392	0.3615	0.0069	0.0034	0.3617	0.2538	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.3365
17-Others	0.1359	0.0856	0.0337	0.3363	0.0076	0.0030	0.3279	0.2191	0.0000	0.0000	0.0000	0.6590	0.0000	0.0000	0.0000	0.0000	1.0000	2.0070
Total	1.7825	0.6170	0.4809	3.8613	0.0947	0.0618	2.3532	1.5731	1.2912	1.2100	2.1417	4.4986	1.0767	0.5214	1.8358	3.5222	0.0000	28.0450

Annex III.6 (cont.) - Table 11: close-loop multiplier effects matrix

ANNEXE III.6 - TABLE 11: CLOSE LOOP MULTIPLIER EFFECTS: Matrix C = (M3-I)*M2*M1

IV. A POLITICO-ECONOMIC FRAMEWORK FOR WAR-TORN COUNTRIES

In this chapter, we first present an analytical framework that enables us to capture the crucial interactions between economic policy and peace-building. We then specify how the main actors behave within this politico-economic framework. On the basis of a simple model of politico-economic interactions, we elaborate on microeconomic considerations that help understand the behaviour of the government, the social groups and the external actors with regard to the requirements of postconflict reconstruction.

The politico-economic framework developed here originates in the pioneering work of Frey and Eichenberger (1992 and 1994) on the political economy of stabilization in developing countries. It is based on a wider perspective than that of the traditional economic approach in that it builds on both Modern Political Economy and New Institutional Economics. The conceptual framework makes it possible to account for the complex challenges related to economic reform in politically volatile settings. It addresses the specific institutional arrangements and politico-economic relations prevailing in today's war-torn countries, i.e. primarily in low-income economies.

We have opted to elaborate on the contributions of Frey and Eichenberger because the political economy approach brings an essential dimension into the economic analysis of conflict-ridden countries. Traditional economic theory assumes that private "egoistic" entrepreneurs are driven by profit, while "benevolent" policy makers seek maximum public welfare. The "political economy" approach departs from this basic assumption and analyses the demand and supply sides of economic policy, i.e. how individual preferences are defined, aggregated and channelled into political demands and how policy-maker preferences take shape accordingly. It also focuses on the government's demand and supply of political support. Political economy analysis thus adds an essential dimension to research on postconflict rebuilding by placing postwar economic reforms in their political contexts. Under this approach, economic policy is viewed as the outcome of interactions among politicians, bureaucrats, interest groups and

external actors within a set of institutional constraints. The new political economy literature views economic policy itself as a process in which distributional considerations and political competition play a crucial role. The endogenous political process then constitutes an important determinant of economic policy.

The will and capacity of government to implement and manage economic reforms may be a requirement for success but those qualities alone do not suffice, especially in the aftermath of a conflict. For powerful domestic actors are often in a position to block reforms if they refuse to co-operate. Standard economic reforms often affect negatively well-organised economic sectors (e.g. public administration) while the potential beneficiaries are politically less vocal (e.g. agricultural and informal sectors). Those who stand to lose from the reforms readily oppose them while winners often do not know who they are before obtaining the induced benefits and thus do not mobilise in support of the reforms (see for instance Krueger, 1993). During the transition from war to peace, this is further complicated by the fact that groups affected by the reforms often simultaneously lose from the peace deal, as the end of hostilities means the disappearance of quasi-rents generated by the conflict. These combined factors can put the whole peace-building process in danger if not carefully dealt with by an appropriate sequencing of reforms and/or compensatory measures.

In what follows, we elaborate on a politico-economic framework which basically consists of two groups of variables: *measures* and *events*. Economic and political measures are related to policy instruments, while economic and political events result from – and shape – policy decisions. There are three actor groups or *decision-making entities*: the government, the social groups and the external actors. The whole system is driven by relative prices: the attitude of social groups towards the government is determined by a cost-benefit evaluation and depends on the relative cost of support or opposition, which in turn hangs on the institutional framework. The same applies to the decision of the government to reward or sanction a given group, as we will elaborate below. The framework focuses on the interactions between the economy, the polity and the major players at stake, be they domestic actors (government, interest groups, etc.) or foreign actors (donors, creditors, aid agencies, foreign investors, etc.). The framework thus integrates a political dimension into economic analysis and vice-versa.

Following Frey and Eichenberger (1992), we illustrate the fundamental politico-economic interactions prevailing in developing countries as suggested in figure IV.1. The system can be briefly summarised as follows: resources generated by the economy flow to social groups who react accordingly and influence the polity, in particular the survival probability of the government. Political instability in turn affects the economy. The political elite seeks to manipulate the economy with the objective first to remain in power, and second to improve its own welfare. Foreign actors primarily intervene by providing economic and political support with conditions attached to it (conditionality). The government reacts to economic and political signals and takes decisions accordingly. These in turn affect the economy and the political situation.

Figure IV.1: Politico-economic relations
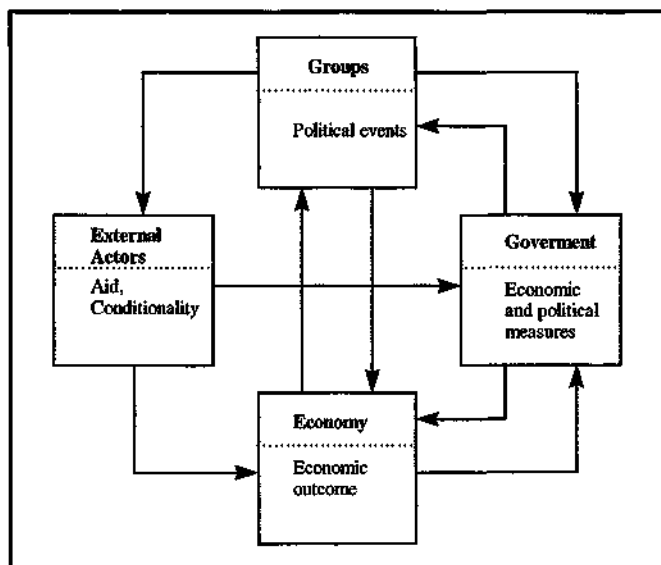
The remainder of this section explores the basic relationships between actors, policy decisions and politico-economic events in war-torn settings in general.

IV.1 THE ACTORS

IV.1.1 The Government

The government is understood to encompass the politicians in power including the presidency, ministers, the ruling party or parties, the security forces and top government executives to the extent that they are political appointees. The primary objective of a government under attack is to retain enough support to stay in power. Note that the motivations for retaining power may be purely egoistic but also ideological, political, religious, ethnic, etc. The second objective of political elites is to increase personal income, wealth and prestige, all the more that the risk of being suddenly ousted out of office increases with political instability (Bulow and Rogoff, 1990). We assume that the government uses political and economic instruments to maximise its utility[1]: Economic policy can be classified as either restrictive or expansionary, which corresponds to unpopular and popular measures respectively. Political instruments fall under two broad categories, i.e. repression and liberalisation. The government's probability of remaining in power is a function of its domestic popularity and of the way it is perceived by external actors. As summarised by Dessus, Lafay and Morrisson (1997: 100-101): "The expression of domestic unpopularity... is a positive function of stabilisation measures, and a negative function of political repression. Unpopularity abroad is a negative function of stabilisation measures, and a positive function of political repression. The former induces a positive reaction from the donors if the country engages in plans to reduce external imbalances, while the latter can trigger a negative reaction on the part of the international community, which in turn weakens the government's domestic position."

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[1] The reader is referred to chapter V for a detailed analysis of the microeconomic foundations behind the government's demand for political support and the groups' supply of support in conflictual settings.

For the government, there is a clear trade-off between economic reforms that are unpopular in the short run and expansionary economic measures that increase short-term support but may impact negatively on the overall economic conditions in the longer run. When implementing restrictive economic measures, the government tends to repress troubles in order to remain in power. Yet, the government might cancel the reforms if popular discontent cannot be kept under control any longer with political instruments such as repression. The final decision depends on the overall costs of repression, be they economic (additional means for the army and the police), or political (increased government dependence on its security forces). The dilemma is particularly acute in the direct aftermath of a conflict: the government is under mounting pressure for economic reform to put the economy back on track and secure access to foreign funds for reconstruction. At the same time, the room for violent repression is drastically reduced by the peace arrangements, often under tight monitoring from the international community. Thus, restrictive economic measures easily trigger civil unrest, while effective postconflict rebuilding requires first and foremost the restoration of political stability.

IV.1.2 The Social Groups

Economic agents are taken to behave rationally, but have imperfect information and limited power of anticipation, or at best adaptive anticipation capacity. The analytical framework consequently focuses on whether a given economic or political measure is sensed by key socioeconomic groups to affect their short-term interests in a positive or negative manner. Groups express opposition to governmental measures through upheavals, strikes, demonstrations and the like. In this dissertation, we limit our analysis to the most relevant groups in conflict-ridden societies to the extent that they play a substantial role in the politico-economic interactions taking place during the peace-building process.

Among *organised groups*, the military, paramilitary and police forces are key players whose active support is essential to both suppress opposition and maintain the government in power. The public administration also has much clout in that it is in a position to systematically block the implementation of government policies, to go on strikes and stage large

demonstrations in urban centres. Key executive branches may have a disproportionate political weight such as the fiscal and customs authorities in charge of collecting government revenue or essential service providers in the areas of health, energy and transportation. The private sector is often highly organised and disposes of powerful means to advance the interests of its members. In our analytical framework, the private sector may react to public policy decisions or political events by placing its capital abroad, emigrating, moving into the informal economy and escaping its fiscal obligations. It is important to note that the private sector plays an ambiguous role: it can be a driving force for peace as well as for conflict. Entrepreneurs may be instrumental in pushing for the restoration of the rule of law and of security as a prerequisite to restarting business. At the same time, they may also perpetuate a climate of insecurity and impunity to carry on criminal activities or preserve rents and quasi-rents generated during the conflict.

Non-organised groups may also exert great influence over politics because of their considerable size. It is worth distinguishing, among the poor and middle classes, between the urban and the rural population. The former may express discontent through riots, strikes and demonstrations. The mobilisation costs are higher in rural areas where people sometimes have no option other than joining the armed insurrection, seek refuge in another region of the country, or flee abroad.

IV.1.3   The External Actors

Foreign actors intervene in a war-torn economy through humanitarian aid, rehabilitation, traditional financial and technical assistance, trade measures ranging from active import promotion to embargo, foreign direct investment, etc. Political interventions may take various forms, e.g. providing support to the opposition or to the government, pressing for peace, brokering or hosting peace talks, etc. External assistance is usually conditioned by a set of targets to be met by the recipient country. Economic conditionality lies in the realm of the international financial institutions (IFIs) and the IMF in particular. Structural adjustment packages encompass measures such as a reduction of the budget or balance-of-payment deficits, privatisation of state-owned enterprises and trade liberalisation. Political conditions are rather set by powerful bilateral partners and may involve clarification and prosecution of human rights

violations, democratisation, downsizing of the security forces, reduction of military expenditures, etc.

Access to foreign finance is usually contingent upon prior agreement with the IMF. Schematically, the IMF provides funds only once an agreement has been reached with the recipient government (primarily the central bank and the finance ministry)[2]. Conditions imposed by the IMF typically include politically sensitive measures such as salary cuts in the public sector, price increases in basic foodstuffs as a result of subsidy cuts, or restrictive monetary/credit policy. In recent years, the IFIs have come to recognise the need for a specific approach for their operations in conflict and post-war situations. In addition to traditional economic conditionality, they have begun to look more and more at peace-related issues and have openly set political conditions in a few cases (e.g. Bosnia-Herzegovina. For a discussion on the IFIs and peace-related conditionality see Boyce and Pastor, 1998).

IV.1.4   The Economy

Economic agents are taken to behave rationally and have limited power of anticipation. In studying politico-economic interactions, we shall focus on the potential trade-off between economic reform and peace-building[3]. The literature on the political economy of structural adjustment shows that orthodox economic reforms tend to hit the interests of public employees and strongly unionised workers in import-substituting sectors, while those supposed to benefit in the medium term are the rural population and successful exporters. The problem is that those who stand to win have often less political clout than those who stand to lose. In addition, potential winners generally ignore whether and how much they will gain from reform, while losers readily organise to defend their interests. During the

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[2] The positive theory of international organisations helps understand how the IFIs actually behave and why. Lalay and Lecaillon (1993) have shown how much the behaviour of these organisations depends on the governments and interest groups of member countries, and on the staff of the international bureaucracy itself. They also highlighted that the volume of loans offered follows closely the cyclical fluctuation in the creditors' economies. Not surprisingly, mandates and operational principles do not tell the whole story.

[3] Based on the politico-economic framework presented above, we will develop a macroeconometric model in chapter VI in which we shall follow usual specifications for the economy.

transition from war to peace, structural adjustment tends to affect the very groups that stand to lose from the peace deal to the extent that both the end of hostilities and economic reforms imply improved market efficiency and the suppression of rents (Boyce, 1996; Keen, 1998). Stabilisation measures may thus add to the incentives to oppose the peace process and restart hostilities.

IV.2 MICROECONOMIC CONSIDERATIONS

The framework outlined above differs from traditional economic approaches by integrating the political dimension. It also differs from the standard politico-economic models in public choice in that it accounts for the specific institutional settings of low-income countries at war, in particular with regard to the autocratic nature of political regimes and the violent means through which discontent is channelled. In this sense, it offers a promising avenue to study political and economic relations in conflict settings.

Our ultimate objective is to construct a macroeconometric model with a view to testing the relations between economic reform and the peace-building process. This will be done in the context of a country case study on Guatemala (chapter VI). Before turning to the model, it is important to specify how the main actors behave within our politico-economic framework outlined above, i.e. examine the behaviour of the government, social groups and external actors. We first present a positive model of government behaviour developed by Frey and Eichenberger (1992) and analyse the demand and supply functions of political support. We assess how this model applies in the case of war-torn countries in general as well as in the particular Guatemalan context, based on our previous analysis of war-torn economies (chapter II). Following Haggard, Lafay and Morrisson (1995), we introduce intertemporality into the model together with political variables such as civil unrest and repression, with a view to highlighting the gap between the optimal policy mix from a government's standpoint and the economic optimum advocated by the international financial institutions. Finally, we turn to the external actors and assess different types of interventions by the international community through their politico-economic impact during the fragile transition from war to peace.

IV.2.1   The Political Support Function

Following Frey and Eichenberger (1992), we model the interactions between the government and the social groups in a demand-supply framework wherein the government demands the support that the population supplies.

The Government's Demand for Support

Frey and Eichenberger assume that the government aims at maximising its utility function *(Ug)* which depends on two variables: own consumption *(C)* and probability of survival *(PS)*. Consumption expenditures of the politicians in power are understood in a broad sense: they encompass not only egoistic expenses to improve their material wellbeing and social prestige, but also expenditures motivated on ideological, ethnic or political grounds. The government's probability of survival *(PS)* is a direct function of the support it gets from the population *(S)*. Under normal circumstances, support could be gauged by a popularity index through regular polls and elections, to the extent that the latter are "free and fair". In the midst of a civil war, such an index is obviously not available. The intensity of government support could then be traced through the behaviour of distinct groups vis-à-vis the government and the rebels, ranging from outright opposition to active support.

The government is confronted with a basic trade-off: increasing *C* reduces *PS* as it diminishes the resources available to muster support from the population. The government utility function can be written as follows:

$$Ug = U\,(C,PS), \text{ with } \frac{\delta U}{\delta C} \geq 0 \text{ and } \frac{\delta U}{\delta PS} \geq 0, \qquad (1)$$

The government of a country at war has limited resources to muster support. This is particularly true for a government such as the Guatemalan one which is constrained by the very limited amount of resources available to pursue its goals *(financial constraint)*. During the conflict, a government also faces *political constraints* related to the risk of being toppled, sometimes with dramatic consequences for the politicians in power (e.g. being jailed or killed). The government is thirdly limited by *technical constraints* given its weak bureaucratic ability and its low capacity to

address the high expectations of its constituents after the war (peace dividends). Following Frey and Eichenberger (1992: 24), we represent the government's utility function given the resource constraint and the trade-off between support and consumption as illustrated in figure IV.2.

Figure IV.2: The government's utility
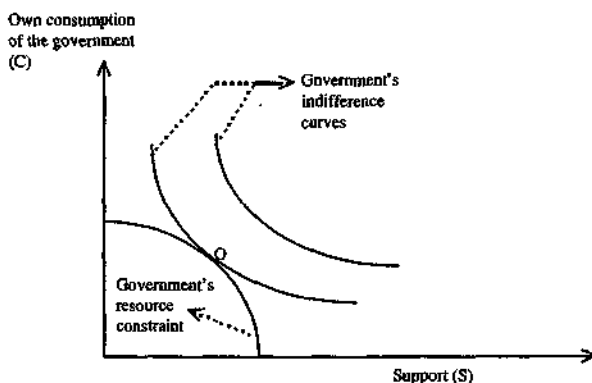
As the resources available are not completely fungible between expenditures for own consumption and increased popular support, there are diminishing marginal returns and the resource constraint is concave with respect to the origin. The optimal trade-off between support and consumption is located in *(O)*. The demand for support curve is then obtained by identifying the optimal demand for support under varying prices of support in terms of the amount of own consumption the government must give up (figure IV.3).

Figure IV.3: Government's demend for support function
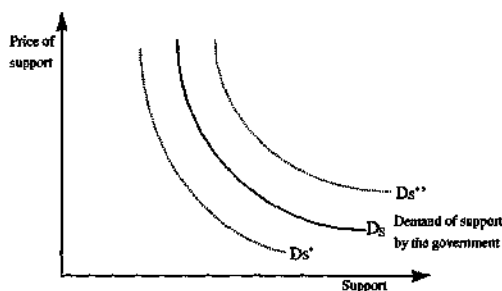
The government's demand for support function depends on a set of political and institutional factors. Based on a review of the literature on conflict and the economy (chapter II) and on insights from our Guatemalan country case study (see next chapter), the main variables determining the support demand function in contemporary conflict-ridden, low-income countries are discussed hereafter:

- The perceived cost of losing power is positively associated with the support demand. During a conflict, this cost is generally high: the people in power may fear to be killed or jailed if the opposition seizes power. The political elite might be deprived of its assets and belongings and lose its dominating position following a major shift in the ethnic and social balance of power. The ultimate survival strategy may be to seek asylum abroad. A government seriously threatened by an armed insurgency is thus inclined to give greater priority to retaining support of crucial groups – the military and security forces ranking first – and is consequently ready to pay a higher price for support. The demand curve tends to shift outwards as a result (Ds'').

- Democratisation associated peace processes reduce the cost of losing power for the politicians in power, shifting the demand curve inwards (towards Ds'). In Guatemala, for instance, this cost can be regarded as relatively low at present. For if the government is sanctioned through elections or is even toppled by a coup, the balance of power between the various social groups is unlikely to be fundamentally challenged, including the oligarchy's dominating position.

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- Governments generally lack resources and have a low fiscal capacity in the direct aftermath of a protracted civil war. Guatemala is no exception: it has the lowest fiscal revenue/GDP ratio in Latin America. This tight resource constraint tends to shift the demand curve to the left (towards *Ds'*). The influx of external assistance for reconstruction may alleviate the situation to a certain extent. In this context, the reconstruction package pledged by the international community in the Guatemalan case (USD 1.9 billion) has enhanced the capacity of the government to muster support.

- State institutions have often been debilitated during the conflict and suffer from a lack of popular legitimacy[4]. In our Guatemalan example, the security forces and the judicial system have been seriously discredited by years of indiscriminate repression and widespread impunity for corruption, crimes and human rights violations. To regain popular support, one of the priorities is to restore some credibility in public institutions. This is all the more necessary that the peace deal has seriously limited the scope for violent repression of the opposition. The demand curve consequently shifts to the right (towards *D''*).

The Groups' Supply of Support

The politico-economic theory of democracy assumes that individuals compare the utility they derive from the government in power with the alternatives and vote accordingly (e.g. Oslon, 1990). This concept can be adapted to the type of authoritarian regimes prevailing in contemporary war-torn countries, *mutatis mutandis*: instead of inflicting electoral sanctions, some groups express opposition through violent means (armed insurrection, coups, upheavals and the like). Others may voice their discontent through demonstrations, strikes, protest marches, etc.

With Frey and Eichenberger (1992), we start from the simplifying assumption that the population and the various interest groups derive utility *(Up)* from the general economic conditions, the special privileges granted to them by the government and the absence of negative sanctions (repression). The government can thus influence *Up* with three sets of

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[4] This is obviously not the case when a popular movement seizes power after winning a national liberation struggle (e.g. Eritrea).

instruments, i.e. general economic policy *(E)* to improve the overall economic conditions *(Y)*, positive sanctions in the form of bribes or economic measures directed at specific individuals or groups to muster political support *(P)*, and repression *(R)* which can be regarded as a negative sanction (e.g. additional means for the military intelligence services). *E* may for instance include public investment in basic infrastructure, in health and education services, etc. The immediate impact on popular support may be negative, but is expected to turn positive after some delay. *P* encompasses bribes and privileges granted to specific groups and may take the form of tax exemption, rents, subsidising basic foodstuff prices or the steel industry, protecting a given sector from external competition, preferential access to jobs in the public sector, etc. *P* enhances support instantaneously, but reduces the surplus available to the government for discretionary consumption *(C)* since bribing supporters is costly. The utility function is written as follows:

$$U_p = U (Y, P, R) \tag{2}$$

where *Y* and *P* are positively associated with the groups' utility, contrary to repression *(R)* which is negatively correlated.

Figure IV.4 suggested by Frey and Eichenberger (1992: 26) depicts the resource allocation dilemma facing the authorities: the politicians in power have to muster a sufficient amount of support from the population and the various interest groups to remain in power. As the resources at their disposal are limited, they are forced to allocate them as efficiently as possible between *E*, *P* and *R*. The government's possibility curve ABC depicts this allocation trade-off in the case where all available resources are spent exclusively on mustering support. This could be the case of a risk-averse government which feels dangerously threatened by the opposition. The possibility curve is concave with respect to the origin, reflecting that the productivity of resources affected to *E* and *P* is positive, but subject to diminishing marginal returns.

Figure IV.4: Government's decision on resource allocation
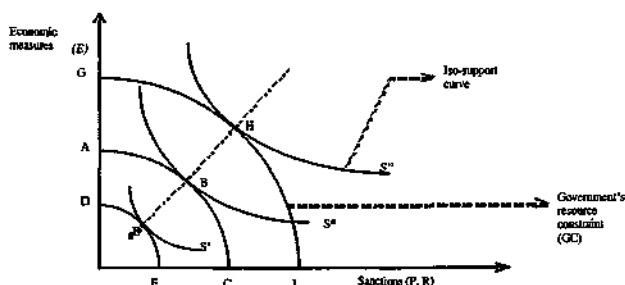
Opting for a policy mix set in B, the government gets S^* support which maximises its probability of survival given the resources at its disposal. A government that either feels less threatened or is less risk-averse will choose a trade-off point inside the ABC curve, such as E for instance. This government receives less support but enjoys the surplus that was not spent on mustering support for its own consumption. On the opposite side, a government which has not sufficient resources to muster what it considers as being the minimal level of support required to stay in power may seek access to foreign finance. If it is granted a loan, it can spend GHI and succeeds in raising support to the level S''.

In other words, Frey and Eichenberger (1994: 27) illustrate in figure IV.4 the function that associates the values of a variety of government resource allocations with different support levels. They conclude that "the derivative of this function can be interpreted as the support supply function or the marginal cost of support function which will presumably be upward-sloping"[5]. The Ss curve represents the support provided by the population and the various groups when comparing the utility they get from the present government with the alternatives. When combined with the demand curve, it determines the equilibrium support, as shown in figure IV.5 below.

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[5] In their paper on the political feasibility of stabilisation programmes in developing countries, Frey and Eichenberger (1994) introduce the concepts of appropriability and attributability as tools to examine the institutional conditions that determine the support supply and demand functions. Appropriability refers to how far the government can appropriate resources, and attributability focuses on the extent to which economic benefits are attributed by the beneficiaries to government policies, thus increasing support.

Figure IV.5: Government's equilibrium support
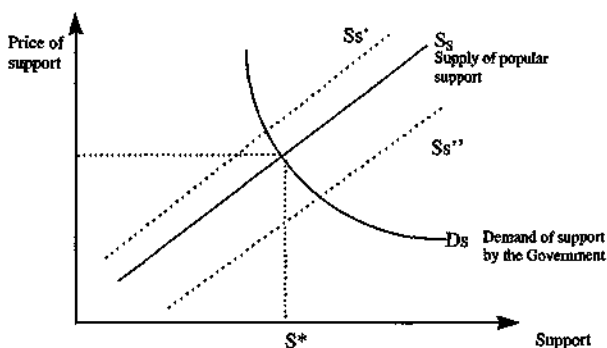
$S^* = $ equilibrium support.

The main determinants of the government's supply of support function in the case of war-torn countries are the following:

- In a New Institutional Economics perspective, transaction costs increase with the conflict as a result of the weakening of institutions, the deterioration of social capital and the high level of political and economic insecurity. More protection provided by the authorities results in more support, provided the price of support remains equal. In other words, increased security services shifts the support function downwards (for instance towards *Ss''*) to the extent that investors, and capital owners in general, are willing to pay a higher price to get effective protection from the government (e.g. improved private property protection, contract enforcement). The contrary holds in the case of state collapse (e.g. Liberia and Sierra Leone at certain stages), where the government is unable to provide effective protection.

- Expression of support to the government or the opposition costs more in the midst of a civil war than would be the case in a democratic and peaceful context: voting is definitely less costly – or risky – than taking

sides in an armed conflict. This shifts the supply curve upwards in war-torn countries (could correspond to *Ss'*), at least as long as the government has not been debilitated to the point that the threat of repression has disappeared. Some African conflicts have weakened the state apparatus to such an extent that governments have lost the ability to reward and sanction their constituents (Zartman, 1995; UNCTAD, 1997). In such contexts, withdrawing popular support hardly bears any cost.

- In a majority of countries at war, the state is highly centralised. This maintains the supply curve upward as people are willing to pay a high price for support, given the virtual monopoly of the central government over negative and positive sanctions. In recent years, peace processes have involved decentralisation and power-sharing arrangements, as is the case in Guatemala. The devolution of power from the centre to the periphery tends to shift the supply function to the left as it reduces the leverage of the central government, and hence the incentives for support.

- Low-income economies devastated by a civil war have to (re-)integrate the global economy. This usually comprises inter alia the adoption of economic reforms inspired by the IFIs, including market deregulation and trade liberalisation. This reduces the resources and instruments available to the government to reward supporters, as illustrated by trade liberalisation and economic reform in Guatemala: the tariff cuts and nontariff barrier removal agreed under the CACM and the WTO have limited the government's capacity to protect specific sectors and firms against external competition while stabilisation efforts have led to subsidy cuts in sensitive areas (basic foodstuffs, public transportation, etc.). The adoption of liberal policies tends to shift the support supply function to the left to the extent that the private sector and other important social groups become aware of the reduced capacity of the state to offer significant privileges.

We have seen that specific factors related to conflicts and peace-building shift the supply curve in different directions. The aggregate impact that eventually determines the ensuing equilibrium support varies from case to case. To sum up, policy decisions made by the government are dictated by the relative price of support. The latter depends on the particular politicoinstitutional factors prevailing in each context, which determine the government's possibility set and support curves.

IV.3   ECONOMIC VERSUS POLITICAL OPTIMUM

Morrisson, Lafay and Dessus (1993), and then Haggard, Lafay and Morrisson (1995), expand on the above model in a synthesis of a research programme conducted under the OECD Development Centre on the political feasibility of adjustment in developing countries. In this synthesis (hereafter referred to as the OECD Study), the authors introduce intertemporality into the model developed by Frey and Eichenberger (1992). They show how the optimal combination of economic and political measures (E and P) for the politicians in power diverges from the optimum defined from a strict economic point of view, which corresponds to the optimum advocated by the IFIs.

IV.3.1   The OECD Model (1993 & 1995)

In a simplified way, Morrisson, Lafay and Dessus (1993) assume that government consumption (C) depends only on the level of repression (R) and writes the consumption function as follows:

$$C=c(R), \text{ with } c' < 0 \tag{3}$$

Repressing opposition carries an economic as well as a political cost. Additional resources for repression means an increase in the budget share – and power – allocated to the security forces, and raises the risk of a coup d'état. Violent governmental repression and human rights violations also increase the probability of negative sanctions on the part of the international community, which may translate into a reduction of economic assistance, the withdrawal of trade preferences, a reduction in military support, etc.

To the extent that the government's survival probability hangs on the intensity of support from the population (S) and of the degree of repression to suppress opposition, the probability of support function is written as:

$$PS=ps(S, R) \text{ with } \frac{\partial ps}{\partial S} > 0 \text{ and } \frac{\partial ps}{\partial R} > 0. \tag{4}$$

In the OECD Study, the ensuing overall utility function of the government is thus:

$$U=u(c(R), ps(S, R))$$ (5)

It is assumed that the government operates with bounded rationality. In Herbert Simon's terms, it "satisfies" instead of "maximising": once the government has determined a minimum acceptable probability of survival (*mPS*), it then seeks to maximise its utility. Supposing that the additional utility resulting from a level of *PS* superior to *mPS* is negligible, the government's objective is:

Max U[c(R)] on condition that *ps (S, R)* ≥ *mPS,*

where $\frac{\partial U}{\partial c} > 0$ and $\frac{\partial U}{\partial ps} > 0$ (6)

Following Frey and Eichenberger, the OECD Study posits that the government has two broad sets of instruments to muster support *(S)*: expenditures of general interest *(E)* to improve the overall economic conditions *(Y)* and political expenditures to muster support of specific groups *(P)*. The government's choice thus follows a two-step process: the tax revenue being given, the government first maximises popular support through economic and political expenditures. From an economic point of view, political expenditures are a pure loss. Second, given its maximised level of political support, the government minimises the level of repression compatible with its minimal probability of survival *(mPS)*.

In this chapter, we provide a static representation to illustrate how the economic and political optima differ. It is nonetheless useful to briefly introduce intertemporality in order to better understand what happens in the real world, as we will do in the next chapters focusing on Guatemala. Morrisson, Lafay and Dessus (1993) outline a simplified two-period model where *E* increases GDP growth with a lag of one period while *P* increases immediate political support but reduces economic growth in the second period[6]. They write the government's support function in this two-period time frame (0=now, 1=future) as:

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[6] It is unfortunately not clear how these authors arrive at this formulation.

$$S = S_0 + (\dfrac{1}{1+\sigma})S_1 \quad \text{with} \quad S_0 = s_0(Y_0 - T_0, P_0)$$

$$\text{and} \quad S_1 = s_1[Y_1(T_0, P_0, E_0) - T_1, P_1] \tag{7}$$

where σ is the political discount rate of the government and Y corresponds to GDP. The political dilemma facing the government now appears more clearly. Initial support (S_0) depends on income (Y_0) after deducting taxes (T_0) and on political expenditures (P_0). During the next period, political support (S_1) depends on future available income which is affected positively by E_0 and negatively by P_0, as well as on taxes (T_1) and political expenditure (P_1) in the second period.

Haggard, Lafay and Morrisson (1995) then define the political optimum from the authorities' standpoint. They adopt the hypothesis that the government maximises support under the budgetary equilibrium constraint. The latter is described as follows, assuming that the government cannot print money nor borrow, public expenditures being thus exclusively financed through taxes:

$$T_0 = E_0 + P_0 \tag{8}$$

In other words, the *political optimum* corresponds to the allocation of total tax receipts (T) between growth expenditure (E) and political expenditure (P) that maximises the government's discounted political support level. The objective of this model is to highlight that the *economic optimum* may radically depart from the optimal policy-mix described above that reflects a purely political perspective.

The *economic optimum* corresponds to the solution that maximises the flows of discounted revenues (equation 9 below) under the budget equilibrium constraint (equation 8). These flows (Y) can be written in a two-period framework as

$$Y = Y_0 - T_0 + (\dfrac{1}{1+r})(Y_1(T_0, P_0, E_0, R_0) - T_1) \tag{9}$$

where Y_0 is given as exogenous and r is the economic discount rate, which has a priori no relation with the political discount rate (σ)[7].The economic

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[7] The equation is adapted from Morrisson et al. (1993): T_1 is subtracted from Y_1, and we add $R0$ in the variables explaining Y_1 (see figure IV.7).

optimum thus requires the elimination of political expenditure altogether, since P_0 is negatively correlated with Y_t and is a pure waste from an economic perspective. The solution is obtained when, again from a purely economic standpoint, the marginal cost of taxation equals the marginal benefit of economic expenditure.

What conclusions can we draw from this OECD model with regard to the complex interactions between economic reform and peace-building? To better capture the politico-economic dilemma of war-torn countries, we should compare the optimal policy mix chosen by the government facing an armed insurrection with the political optimum in a more stable and peaceful situation. Because of the threat posed by the conflict, the people in power become more reluctant to sacrifice short-term political support for longer-term improvements in the overall economic conditions. The political instability accruing from the conflict tends to increase the intertemporal political discount rate (see equation 7). For a government seriously threatened by violent opposition, the relative importance of popular support in the future diminishes, compared to the necessity to muster enough immediate support to stay in power while repressing the insurgency. On the other hand, the economic utility derived by the population from expected improvements in the overall economic conditions may also drop to the extent that priority is given to immediate survival and wellbeing. This "short-term bias" of a government under attack tends to worsen the economic conditions through the combined effect of reduced E_0 and increased P_0 on the discounted income (Y).

IV.3.2 Graphical Presentation of the Political and Economic Optima

As in the OECD study, our chief objective here is to provide a simple, graphical illustration of the political and economic optima associated with different patterns of government expenditure and repression. More specifically, the aim is to highlight how the heavy political constraint typically facing weak governments during the transition from war to peace (constraint related to mPS) prevents the system from reaching the economic optimum described earlier. To this end, we opt for a static representation of the OECD model, abandoning the intertemporal dimension.

The OECD Study points out that, for a given level of popularity *(S)*, the level of repression depends on the level of "aspiration" of the government for *PS*. Repression being a source of disutility, politicians in power will seek to secure the minimal level of probability to retain power. In a war-ridden country, it corresponds to the minimal probability of survival *(mPS)* a government under attack wants to secure (see equation 6 above for the government's utility function). This is illustrated in figure IV.6 where the government tries to locate itself on the iso-probability curve for survival corresponding to *mPS*. For a given popularity level *Sa*, the government sets repression at *Ra* in order to secure *mPS*. The iso-probability curve is convex with regard to the origin, reflecting the increasing marginal level of repression required to offset a marginal reduction of popularity *(S)* – and vice versa.

Figure IV.6: Support and repression
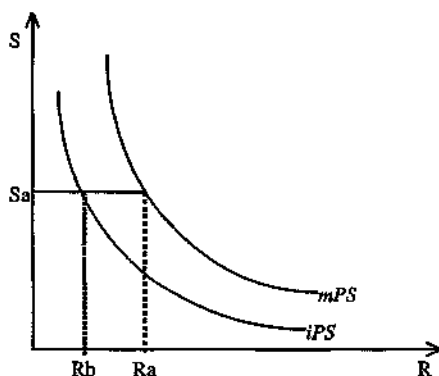
Departing from – or rather expanding on – the OECD study, we introduce and discuss the impact of *political or peace-related conditionality* exercised by external actors, as in the Guatemalan case (see chapter V). The impact of such political conditionality exerted by foreign powers on war-torn countries is first represented with regard to repression in figure IV.6. When the government is caught under increasing pressure on the part of the international community to contain repression (e.g. improve the human rights situation) and wants to avoid the risk of international

sanctions (e.g. suspension of aid, embargo), it is led to reduce the intensity of repression, say from *Ra* to *Rb*. Provided the political leaders have no means to simultaneously increase their popularity level above *Sa*, they are bound to face a lower level of probability to retain power. This is represented by the curve *iPS* in the figure above, resulting from a lower level of repression *Rb*. This probability of survival constrained by international pressures (*iPS*) may not be sufficient to retain power, and the ensuing political instability may actually impair all reconstruction and peace-building efforts because of a negative incidence on investment.

The figure IV.7 below shows how the optimal policy mix from the political leaders' point of view diverges from the economic optimum. We first look at the upper-right graphic in figure IV.7 where we represent iso-taxation curves. These curves indicate, for a given level of tax revenue *(T)*, the level of support resulting from the distribution of public expenditures between *E* and *P*, under strict budget equilibrium constraint (see equation 8)[8]. For a tax level *Ta* for example, the optimal distribution of public expenditure that maximises support is obtained at *Ea*. When linking the higher point of each and every iso-taxation curve together (between *Ea* and *F*), we can determine the optimal level of taxation *T* as well as the amount of public "economic" expenditures that allow for the maximal political support.

- Let us first consider the *political optimum* (letters with *p* subscripts) that shows the short-term solution favoured by governments under serious threat of being topped by an armed insurrection. Given the optimal level of total tax receipt *T*, the policy mix that will be favoured from a purely political perspective is to set the level of economic expenditure at *Ep* and spend *Pp (=T-Ep)* on political expenditure. The ensuing level of popularity is *Sp* that corresponds to the political optimum. We now turn to the upper-left part of figure IV.7 which follows the logic illustrated in figure IV.6. Given the popularity level enjoyed by the government *(Sp)*, the repression level is set at *Rp* in order to secure the minimal probability of survival *mPS*.

- Economic conditionality exercised by the international financial institutions pushes the government toward the *economic optimum* (see letters with *e* subscripts). The economically optimal policy mix is set at

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[8] In this static representation, *S=s(Y, P)* where *P=(T-E)*. We can consider that the level of popular support increases at low level of political expenses (bribes, subventions), up to a point where massive bribing spurs resentment from those left aside.

Ee where all the government resources are spent exclusively on economic expenditure. But popular support is reduced from *Sp* to *Se* because of the cuts in political expenses. As a result, the probability of survival falls down to *iPS*, that is below what the government regards as the minimal level required to stay in power. The political elite reacts by intensifying repression from *Rp* to *Re* in order to maintain the minimal probability of political survival (*mPS*).

As it clearly appears, the ideal policy-mix from the government's political perspective is far from optimal from a purely economic point of view, where the marginal cost of taxation equals the marginal benefit of expenditure.

Figure IV.7: Government expenditura and repression associated with the political and economic optima
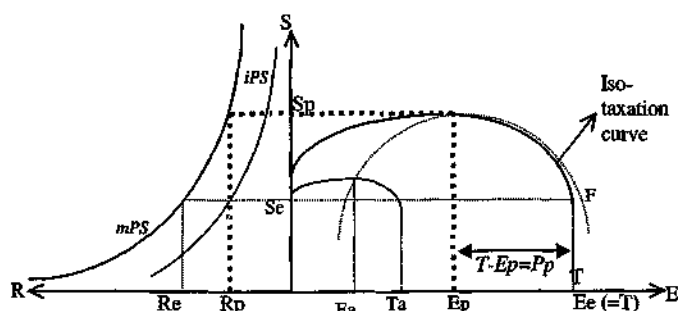
Based on the figure above, we now want to illustrate the economic and political optima. To this end, we first turn to figure IV.8 below which specifies the impact of repression measures *R* on income. Intensive repression may be economically very costly, as confirmed empirically in the case of Guatemala (see chapter VI). For high levels of violence associated with repression of political opposition tend to affect the economy via a negative correlation with investment and consumption. There is thus an increasing marginal cost of repression in terms of additional economic expenditure *(E)* necessary to offset the negative impact of *R* on the overall economic conditions. This holds for repressive regimes or governments fighting a civil war, but needs to be qualified at lower level of repression, as discussed on the basis of figure IV.8.

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Figure IV.8: The cost of repression

Economic
expenditure (E)
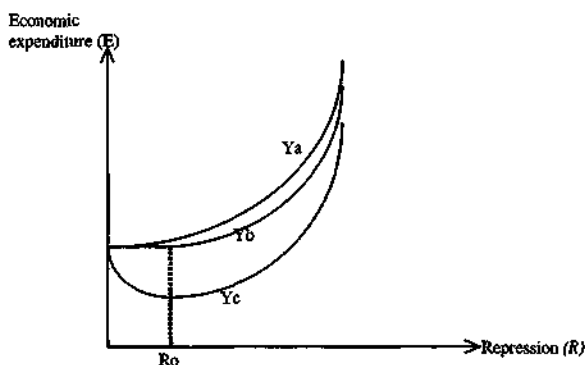
Ya, Yb and *Yc* represent three iso-income curves based on different assumptions regarding the marginal cost of repression for a given level of taxation. It is plausible that the marginal cost of *R* may never turn negative (*Ya* and *Yb*). More realistically, it may be negative at very low level of repression if we consider that the total absence of repressive measures against opposition discourages investment to the extent that economic agents may fear that social unrest may readily transform into widespread political instability (*Yc*). In the NIE jargon, the lack of adequate means for the security forces to protect the proper functioning of institutions may increase transaction costs when the rule of law cannot be secured (contract enforcement, protection of property, etc.). In this case, the marginal cost of repression is negative (i.e. marginal benefit) up to *Ro,* and then turns increasingly positive, as illustrated by the iso-income curve *Yc. Ro* would then correspond to an optimal repression level from a purely economic standpoint[9].

In the case of conflict-ridden countries like Guatemala, the level of government repression is high, by usual standards, as a consequence of the conflict. This is why we assume in this dissertation that repression anyway lies above *Ro* in the specific politico-institutional settings of contemporary war-torn countries we are interested in. In this regard, the iso-income

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[9] Another scenario is that very low levels of repression may not have any impact on the discounted income at all. This is illustrated by *Yb* curve which is horizontal up to a certain level of repression, *Ro.*

curves shown in figure IV.8 and IV.9 highlight the politico-economic challenge in conflict-ridden countries. The shape of these iso-income curves reflects the increasing marginal cost of repression in terms of additional economic expenditure (E) necessary to offset the negative impact of R on the overall economic conditions. The iso-income curves further show that the impact of repression on the economy is less pronounced at lower income levels, investment variations being smaller.

IV.4 ECONOMIC REFORM VERSUS PEACE-BUILDING

In the conflict aftermath – or during the reconstruction phase – major shifts in the government policy mix are urgently required. The economic imbalance inherited from the war calls for profound economic reforms while the consolidation of peace often implies limited room for repression combined with political liberalisation/democratisation and less resources and power allocated to the security forces. To examine these complex interactions, we introduce the external actors in the model, and focus on the impact of economic and political conditions set by the international community on the domestic politico-economic variables.

IV.4.1 Aid, Economic Reform and Political Conditionality

External actors often exert a decisive influence over the rebuilding process. Schematically, they intervene through three basic instruments: external assistance (aid), political/peace conditions and economic conditionality. We first analyse the implication of the two types of conditionality in the framework of our model with the budgetary constraint $T=E+P$, and then introduce foreign aid as a possible way to partly reconcile the contradictions between economic and political conditions.

As mentioned earlier, *economic conditionality* is primarily exercised by the IFIs, and the IMF in particular. It is concerned with the introduction of stabilisation and structural adjustment measures which aim at improving the economy in the medium run through a reduction of P and an increase in E. The reforms tend to limit both the amount of resources and the scope of

instruments available to muster political support[10]. It is true that standard stabilisation measures often encompass a reduction of public expenditures to restore budgetary balance. But in Guatemala, the IMF repeatedly advocated for a major tax reform to raise public revenues rather than cutting public expenditure. Striking a balance between these two opposite scenarios, we maintain the overall level of taxation at T after the introduction of economic conditionality, as in figures IV.9.

For the sake of simplicity, the graphic illustration in figure IV.9 captures one period only, and the political and economic optima are defined by the potential income (Y^*) at the end of this period. Potential income (Y^*) is indirectly influenced by both the level of public economic expenditure and repression through the impact of the latter on investment. Hence, $Y^*=y^*(E, R)$. The four iso-income curves represented in the E/R plan correspond to different levels of potential income. Economic conditionality typically implies a shift in the allocation of government resources in favour of E. For the purpose of our presentation, we suppose that it pursues the objective of optimal allocation of resources (economic optimum). Under an economic rationale, IFI experts tend to expect economic conditionality to substantially improve the overall economic situation, from Y^*p to Y^*e in figure IV.9. But by doing so, they would ignore the political constraint facing the government. It is now well known that the implementation of orthodox reforms may spur political unrest as the social groups bound to lose readily organise to oppose them (see e.g. Bates and Krueger, 1993). The ensuing instability requires increased repression from the government to maintain an acceptable probability of retaining power (mPS), that is for the ruling elite to avoid being toppled by increased opposition. In practice, repression intensifies to counter the additional opposition to – or lower level of popularity enjoyed by – the politicians in power after the introduction of the reforms.

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[10] It should be noted the reform may not affect the government's popularity as negatively as expected if the blame for eliminating P is shifted to the IMF. This is explained under the same logic as the positive impact of foreign aid on government's support by the notion of attributability elaborated by Frey and Eichenberger (1992).

Figure IV.9: Economic and political conditionality
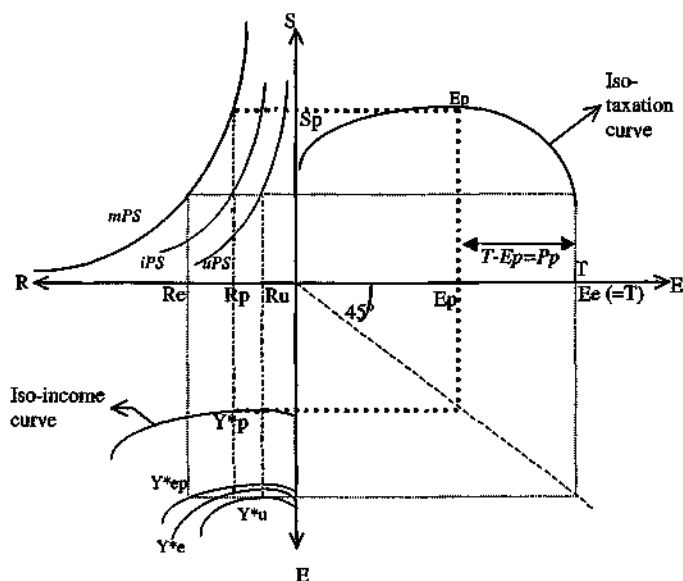
This is illustrated in the lower-left graphic in figure IV.9. The economically optimal solution advocated by the IFIs would correspond to $Y*e$. But if repression remains stable at Rp, the probability of political survival would drop to iPS, that is below the minimal level mPS. Because of this political constraint, the government reacts by increasing repression from Rp to Re in order to guarantee what it considers as a minimal survival probability (mPS). Consequently, when taking into account the political constraint, a switch from the political to the economic optimal policy-mix results in a lower increase of potential income than initially foreseen: from $Y*p$ to $Y*ep$ instead of $Y*e$.

Theoretically, we can imagine an utopian scenario in which a benevolent government would only seek to maximise welfare, without paying attention to its own political survival. Such an ideal government would reduce repression to Ru (u for utopian), where the marginal cost of repression equals the marginal benefit. The survival probability would drop as low as uPS, but potential income would be maximised at $Y*u$.

During the transition from war to peace, political leaders are put under strong pressure not only to reform the economy, but also to contain or eliminate violent repression altogether. These pressures exerted by the international community are referred to as *political* or *peace conditionality*. For peace accords often comprise a commitment to reduce the size and budgetary resources of the security forces and are often accompanied by tighter international monitoring of the human rights situation, which reduces the room for violent repression. We represent this in figure IV.9 by setting the maximum repression level tolerated by external actors at Rp.

When combining economic and political conditionality under the budgetary constraint described earlier $(T=E+P)$, the probability of political survival thus drops below mPS, which may not be sufficient anymore for the ruling party or coalition to remain in power. In the direct aftermath of a protracted conflict, this may give rise to renewed political instability and eruptions of violence, which discourage potential investors and depress consumption (see chapter II). If this further derails the peace process, rebuilding efforts may be irredeemably impaired, with dire human and economic consequences. These contradictions or inconsistencies between economic and political conditionality call for increased coherence between the diverse responses devised by different ministries and organisations in donor countries to help war-torn societies rebuild themselves.

How do politicians in power react in this framework? Contrary to a common assumption among certain economic experts, government leaders are not behaving irrationally when they decide to withdraw some or all of the economic reforms and keep on "wasting resources" on political expenditure. In order to maintain mPS, they may simultaneously decide to intensify repression at a level situated between Rp and Re. In both cases, they run the risk of negative sanctions on the part of the international community for not complying with the economic and/or political conditions. In practice, these conditions are attached to the provision of specific advantages granted by external actors, be they financial, technical, commercial, military, diplomatic or other. The provision of economic and financial assistance releases the fiscal constraint by increasing the resources available to the government. In this context, the benefit of a stand-by agreement with the IMF is not limited to the credit granted to face balance-of-payments difficulties. It also enables the government to enjoy

better access to external finance as other institutional, bilateral and commercial lenders may feel reassured by the said agreement[11].

Foreign aid can help to reconcile the economic and political objectives set by external actors to a certain extent. External actors may seek to maintain the government's probability of survival during the transition from war to peace, which may help secure the minimum level of political stability necessary to attract investment, jump-start the economy and consolidate the peace process.

Figure IV.10: Including Foreign aid
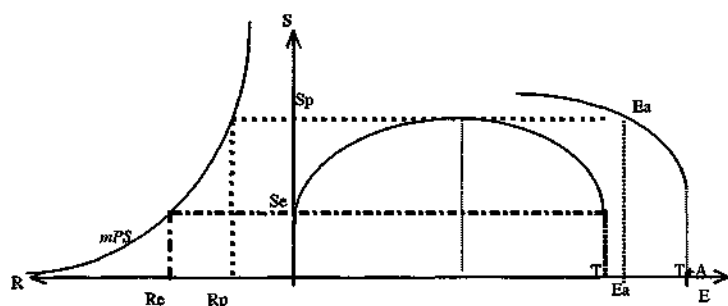
In figure IV.10, external economic assistance *(A)* should amount to $T+A - T$ to enable the government to maintain its probability of survival at *mPS* while at the same time allocating *Ea* to economic expenditure as required by economic conditionality. The resources that the government would still allocate to political expenditure in order to muster sufficient support would amount to $T+A - Ea$. In practice however, support does not rely only on the amount of foreign aid that is granted but also on the subjective perceptions of the recipients: according to the notion of attributability (Frey and Eichenberger, 1992), popular support increases to the extent that the target groups attribute the induced benefits of foreign aid to the government. Thus, direct aid delivery by international organisations to the beneficiaries

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[11] It has been estimated in this respect that one dollar of IMF or World Bank money brings in four more (Laïdi, 1989).

has little or no impact on the level of government support, whereas indirect provision through government channels is more likely to release the government's resource constraint (from T towards T+A).

IV.5 CONCLUDING REMARKS

In this chapter, we outline a politico-economic framework and then illustrate an interactive model in terms of the demand and supply for government support developed by Frey and Eichenberger (1992). We elaborate on the contributions brought by Haggard, Lafay and Morrisson (1995) to highlight that the politically optimal policy mix from a government's standpoint radically differs from the economic optimum advocated by the international financial institutions. Intertemporality is introduced in a two-period framework to better understand the nature of politico-economic interactions between different types of government expenditure. We then revert to a static representation of the model and integrate civil unrest and government repression. We assess the implications of the political conditionality exerted by major foreign partners with respect to democratisation, peace-building and human rights. We show how this interacts with the traditional economic conditions set by the IFIs and highlight profound inconsistencies between political and economic conditionality. We then include the provision of economic assistance by the international community and illustrate how it may partly reconcile the different responses devised by foreign actors to cope with the complex challenges of post-conflict reconstruction.

As is now well documented, orthodox economic reforms in war-torn countries may produce results at odds with initial expectations (e.g. Boyce, 1996 and FitzGerald, 1997). Positive supply responses following structural adjustment are particularly slow and weak in post-conflict countries because of considerable structural and institutional bottlenecks. But in the absence of rapid improvements in daily life following the misery of a protracted conflict, additional opposition to the reforms may originate from a wide spectrum of the society disappointed by the absence of "peace dividends". Potential winners generally do not know if and how much they might gain from the reforms and therefore do not mobilise in support of them. On the other hand, those who stand to lose react swiftly to defend their interests. This political balance is further aggravated during the fragile transition from war to peace: as some rents have been generated by

the conflict itself, powerful groups may have additional incentive to perpetuate a climate of violence and revive hostilities to preserve the advantages that would be suppressed by the reforms.

Against this background, the international community can contribute to a more stable and successful transition from war to peace. Aid can play a crucial role in supporting the establishment of safety nets to protect the poor, as well as in providing adequate compensation to potentially destabilising groups who fear they might lose from the peace deal (e.g. demobilised soldiers, merchants in control of the black market). However, we argue that economic conditionality must be carefully adapted to the specific circumstances prevailing at local and national levels. External actors, and the IFIs in particular, should avoid insisting on economically optimal solutions that may spur widespread short-term discontent with the attendant risk of renewed violence. This may require to postpone important reforms while giving explicit priority to the restoration of a minimum level of political stability.

In the following chapter, we analyse the evolution of the Guatemalan polity and economy over the past twenty years. We then develop a macroeconometric model to assess how economic and political conditionality have interacted in this country from the peak of the conflict to the successful conclusion of the peace accords.

V.   A GUATEMALAN CASE STUDY

The signing of the "Agreement for a Firm and Lasting Peace" on 29 December 1996 put a formal end to a long, dirty war that tore Guatemalan society apart. Thirty-six years of civil war left an estimated 200,000 civilians dead – for a total population of 10 million – according to the final report of the Commission for Historical Clarification released in February 1999. This report confirms the dramatic responsibility borne by the state, the army and the security forces in the conflict, these being responsible for 93% of the deaths and disappearances. The war further left thousands "disappeared", approximately one million displaced people, around 100,000 orphans, and many mass graves around the country filled with bone fragments[12]. The conflict began with a Central Intelligence Agency (CIA)-backed military coup in 1954, ousting elected leftist President Jacobo Arbenz, and was declared a "civil war" by 1961. Among the various reasons behind this dramatic conflict, four major root causes have often been underlined: (i) the appalling inequality in the distribution of land, income and wealth, and in access to resources and public services; (ii) the extreme political and ideological polarisation in the context of the Cold War; (iii) the unmitigated exclusion and exploitation of the indigenous people (Mayas) who make up between 50% and 60% of the total population and who were the principal victims of the violence; and (iv) the lack of political channels for peaceful negotiations between diverging interest groups (Balencie and de la Grange, 1996). The United States of America, and the CIA in particular, actively backed the counterinsurgency policy and repression of the Guatemalan state. This led President Clinton to formally apologise for the US involvement in the Guatemalan tragedy during his visit to Central America in March 1999.

This chapter provides a historico-analytical perspective on Guatemala, focusing on the period ranging from 1979 to 1996, that is from the most violent years of the internal conflict to the eventual signature of the peace

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[12] Figures that have never been substantiated estimate that only 15% of the casualties have been accounted for in direct military confrontation.

accords. This chronological analysis of the Guatemalan economy and polity does not pretend to be exhaustive in any way: we limit ourselves to the main elements entering into the analytical framework developed above, i.e. the domestic and external actors, the political events and measures (the polity), and the economic events and policies (the economy).

The ultimate objective of this historico-analytical presentation is to provide a concrete application of the analytical framework outlined in the previous chapter. Thus, a thorough analysis of Guatemalan history, government, civil society and political forces at play would go far beyond the scope of this study. We restrict our presentation to the core elements entering into the politico-economic framework in chapter IV (see figure IV.1), that is:

- the three decision-making *actors*: the government, the social groups and the external actors;

- the political and economic *events* or outcome;

- the *policy decisions* or the economic or political measures taken by the
. government.

Turning to the political and economic events or outcome, we will proceed to review the main policy measures taken by the government between 1979 and 1996, bearing in mind that the prime objective of such an overview of economic and political relations is to prepare the ground for effective and systematic data collection. The political and economic information will be processed in order to obtain quarterly indicators. These will be entered into a macroeconometric model which will serve to empirically assess the politico-economic interactions in Guatemala between 1979 and 1996 (see Chapter VI).

V.1   POLITICAL EVENTS AND MEASURES

Unless otherwise specified, our bibliographical sources are the quarterly *Country Report* of the Economist Intelligence Unit (EIU) and the monthly *Central American Report* of Inforpress Centroamericana (IC). The EIU reports provide systematic information on the main political events and economic policy decisions as well as on the evolution of the economy. The IC reports are summary English versions of the weekly *Boletines* published

in Spanish, also by IC, and focus on political affairs, social and labour issues and the economy.

V.1.1 Historical Background

Guatemala gained independence from Spain in 1821. From the mid-19th century onwards, the country passed through a series of dictatorships, insurgencies and coups. In 1945 a civilian president, Juan Jose Arevalo, was elected and held the presidency until 1951. Social reforms initiated by Arevalo were continued by his successor, Jacobo Arbenz, who enabled the communist Guatemalan Labour Party to gain legal status in 1952. By the midpoint of Arbenz's term, communists controlled key peasant organisations, labour unions and the governing political party, holding some key government positions. Private sector leaders and the military viewed Arbenz's policies as a serious threat to their own interests and more or less actively supported the 1954 military coup against the Arbenz government, backed by the CIA.

In response to an increasingly autocratic rule, a group of junior military officers revolted in 1960. Although the revolt failed, this group became the nucleus of the forces that would be in armed insurrection against the government for the next 36 years. Three principal left-wing guerrilla groups – the Guerrilla Army of the Poor (EGP), the Revolutionary Organisation of Armed People (ORPA) and the Rebel Armed Forces (FAR) – conducted economic sabotage and targeted government installations and members of the security forces. These three organisations, plus the outlawed communist party, combined to form the Guatemalan National Revolutionary Unity (URNG) in 1982. It is estimated that the URNG counted up to 6,000 troops at its peak. At the same time, extreme right-wing and paramilitary groups, including the Secret Anti-Communist Army (ESA) and the White Hand tortured and murdered students, workers association leaders, professionals and peasants suspected of involvement in leftist activities or sympathy for the opposition.

V.1.2   From 1979 to 1996

Our empirical study on Guatemala covers politico-economic events from 1979 to the end of the conflict. The presentation which follows focuses on political events and decisions as well as on economic policy measures. This information provides the basis on which we construct the quarterly ordered qualitative variables entering the macroeconometric model which we estimate in the next chapter (see presentation of the qualitative and quantitative data sets in chapter VI).

For the sake of simplicity, we can distinguish three main stages in the conflict during this period:

- 1979-1983: high-intensity conflict, terror and massive repression of opposition.

- 1984-1987: lower-intensity conflict and beginning of the democratisation process.

- 1987-1996: initiation of the peace process and intermittent peace talks, slow and partial consolidation of the democratic regime, and continuation of low-intensity conflict with waves of violent repression and recurrent human rights violations.

At the very end of the 1970s the different guerrilla factions increased their activities in a stimulating regional context with the Sandinista victory in Nicaragua and a large-scale offensive of the guerrilla in El Salvador. But contrary to its neighbours, the Guatemalan government strove to remain as independent as possible and did not rely to the same extent on outsiders for politico-military and financial support. It was consequently less responsive to outside pressure. Nevertheless, the army found it preferable to launch a democratisation process in 1983/84, leading to the devolution of power to a civilian government in 1986. The process was kept under control and the military succeeded in retaining much of their power and privileges under the new regime.

In the first years of the 1980s the Lucas García government launched massive counter-offensives and systematically repressed – or simply suppressed – potential popular support to the guerrilla. The first Civilian Defence Forces (PACs) were created by the military in trouble areas to cut the armed insurgency from its popular base. The number of civilians enrolled in PACs peaked at an estimated 900,000 in 1985-86, helping to

instil a climate of distrust and suspicion among the population. Repression led to extreme political polarisation whereby groups were classified as either pro-communist or anti-communist. Those that did not identify with one of these two categories were considered as potential allies of the enemy. Moderate and centre-left politicians were brutally eliminated or fled abroad, thus closing all doors for peaceful political alternatives.

A March 1982 coup by junior officers brought Brigadier General Rios Montt to power. Responding to a wave of violence, the government imposed a state of emergency, while at the same time forming an advisory Council of State to guide a return to democracy, mainly as a result of mounting international pressure. In 1983 the state of emergency was lifted and political activity was once again allowed. Rios Montt sought to combat increased guerrilla attacks with both military actions and economic reforms. But in August 1983 he was deposed by the Guatemalan army, and the Minister of Defence (Mejia Victores) was proclaimed head of state. Constituent Assembly elections were held on 1 July 1984. On 30 May 1985 the Constituent Assembly finished drafting a new constitution which took immediate effect. Mejia called a general election. The Christian Democratic Party candidate, Vinicio Cerezo, won the presidency with almost 70% of the vote and took office in January 1986.

The first two years of Cerezo's government were characterised by a stable economy and a marked decrease in political violence. Two coups were attempted in May 1988 and May 1989 by dissatisfied military personnel, but military leadership supported the constitutional order. The final two years of Cerezo's Administration were marked by a failing economy, strikes, protest marches and allegations of widespread corruption. The government's inability to deal with many of the nation's long-standing problems – such as deficient health and social services and rising levels of criminal violence – contributed to renewed popular discontent.

Presidential and congressional elections were held in November 1990 and President Serrano's government was inaugurated in January 1991. It had some success in consolidating civilian control over the army, replacing a number of senior officers and persuading the military to participate in peace talks with the URNG. But on 25 May 1993 Serrano illegally dissolved the Congress and the Supreme Court and restricted civil freedoms, allegedly to fight corruption. This *autogolpe* failed owing to the combined forces of strong protests by most elements of Guatemalan society, international pressure, and the army's enforcement of the decisions

of the Court of Constitutionality, which ruled against the attempted takeover.

In June 1993 the Congress elected the Human Rights Ombudsman, Ramiro De Leon Carpio, to complete Serrano's presidential term. A package of constitutional reforms was approved by popular referendum in January 1994. Under De Leon, the peace process, brokered by the United Nations in place of the Guatemalan Church, took on new life. The government and the URNG signed agreements on Human Rights (March 1994), Resettlement of Displaced Persons (June 1994), Historical Clarification (June 1994) and Indigenous Rights (March 1995). They also made significant progress on a key agreement on socioeconomic and agrarian issues.

National elections for President, the Congress and municipal offices were held in November 1995 and almost 20 parties competed in the first round of presidential elections. PAN candidate Alvaro Arzu eventually won, based on his strength in Guatemala City where he had previously served as mayor, whereas the newly formed New Guatemala Democratic Front (FDNG), the first legitimate party of the left to compete in 40 years, won almost 8% of the presidential vote and was able to send six deputies to Congress (Banks and Muller, 1998).

V.1.3 The Peace Accords

The peace process started in the framework of Esquipulas II. The first official meeting between the government and the URNG took place in Madrid in August 1987. It was then marked during a whole decade by a series of breakthroughs and setbacks with long impasses in between. The peace negotiations between the URNG and four successive governments led to important commitments, going far beyond the simple laying down of arms. The peace accords deal with structural changes within the society and address some of the crucial points of contention which were at the origin of the conflict. The peace talks became more and more complex and eventually involved a whole set of actors in addition to the government and the guerrilla such as the Catholic Church, researchers from national and international institutes, NGOs, representatives of international financial institutions, etc.

The nine agreements establish an "agenda for constructing the peace". They are intended to pave the way for long-term reconciliation and inclusive development. They should be seen as the first step on a long road towards participatory democracy, stability and shared socioeconomic development. The final success of peace and rehabilitation will depend inter alia on the timely and effective implementation of commitments made by the government. Six of the Peace Accords are substantive while the others focus on more procedural matters. The main substantive accords are:

- *Human Rights,* signed in March 1994: aimed at strengthening human rights organisations and putting an end to crime impunity.

- *Resettlement,* signed in June 1994: established objectives for the resettlement and economic integration of displaced people into Guatemalan society.

- *Historical Clarification,* signed in June 1994: established a commission to report on human rights violations perpetrated during the conflict. The final report was released in Guatemala City on 26 February 1999.

- *Indigenous Rights,* signed in March 1995: calls for recognition of Guatemala's ethnic, cultural and linguistic diversity, and for the right of indigenous people to live by their own cultural norms.

- *Socioeconomic and Agrarian Issues,* signed in May 1996: promotes decentralisation and regionalisation of government services, urges for a more efficient and equitable budgetary and taxation policy, and timidly advocates for some sort of land reform and better protection of the environment. The main quantitative target is to increase tax revenues as a ratio of GDP by 50% in four years, based on a "globally progressive tax system".

- *Strengthening Civil Authority and the Role of the Military in a Democratic Society,* signed in September 1996: calls for improvement, modernisation, and strengthening of all three branches of the state. It contains an agreed list of constitutional reforms which the government will propose and limits the role of the armed forces to defence of national sovereignty and territorial integrity.

Table V.1: Political events and measures from 1979 to 1996

Year, Government	Political Events/Measures	Conflict/Peace	External Actors
1979-81 Lucas García government	Military government. Systematic repression of moderate and leftist politicians and sympathisers.	Most violent period of the conflict. Waves of terror and repression. Scorch earth tactics.	US arms embargo since 79, but reduced US pressure on human rights under Reagan's administration (1981).
1982-83 Rios Montt government	Coup attempts in 1982. State of siege in 82, and state of alert in 83. Montt deposed in August 83. Senior army and business officials angered by the introduction of a 10 percent VAT and by the government's reliance on young army officials.	Civil Defence Patrols Involve up to 10 percent of the population. Increased kidnappings and disappearances.	US military aid frozen by the US Congress because of massive human rights violations.
1983-85 Mejía Victores government	New Constitution approved in May 85 and general elections scheduled. Military hope for a lift of US arms trade ban.	Massive human rights violations continue unabated.	US financial support goes on despite IMF withdrawal. Congress approves small military support at end-84.
1986-86 Cerezo government	Criminality increases despite modest economic recovery. Rise in strikes and demonstrations. Public sector's strikes legalised.	Political violence cools down in 86, but rekindles in 87. First direct talks between URNG and government in Madrid (mid-87).	Diplomatic isolation broken up in 86 by the new civilian government. Ties with UK re-established (territorial dispute over Belize). Foreign aid pours in.
1988-90 Cerezo government	Political turmoil. Two coup attempts fail (88 and 89). But mutinies go unpunished and government is forced to concessions. Increased drug trafficking.	Peace talks resume in 90. Private sector joins for first time. Mounting international concern for human rights abuses.	US military aid on the rise. US aid is made conditional upon human rights improvements in 90. EC assistance increases.
1991-93 Serrano government	Crime rate and narco-traffic soar. Serrano's autocoup in June 1993.	Guerrilla increases economic sabotage. Intermittent peace talks and deadlocks.	In 91, US ties aid to human rights improvement and fight against drug dealers.
1993-94 De Leon government	Strikes in public sector and riots because of price increases (bus fares, electricity, etc.). Increased violence against tourists.	Progress in peace negotiations.	
1996 Arzu government		Final peace agreement signed on 29 December 96.	

Source: EIU Quarterly Reviews 1979 – 1996, Inforpress Centroamericana 1979 - 1996.

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V.1.4   The Legacy of War

Some analysts contend that the Guatemalan conflict has been a protracted social conflict with sporadic outbursts of extreme political violence rather than as a civil war *stricto sensu*. Nevertheless, the legacy left by decades of violence is as devastating as in the case of a civil war: social fragmentation and polarisation, distrust among different social groups and between them and public institutions, uncontrolled criminality and violence, weak judicial system, widespread impunity and a sense of generalised fear (War-torn Societies Project, 1997c).

The impact of the Guatemalan conflict on prospects for socioeconomic rehabilitation and development is best understood when assessed under NIE's (New Institutional Economics) lenses. One of the major legacies of war resides in a general lack of popular legitimacy of the public sector, including the military and security forces. Another consequence from years of conflict and impunity is an appalling level of criminality or banditry and the associated high – sometimes even prohibitive – costs linked with contract enforcement and protection of property rights. The disintegration of the social fabric and erosion of interpersonal trust are another legacy that profoundly affects social, political and economic relationships. The rehabilitation of basic social networks, interpersonal relationships and the restoration of the state's credibility and legitimacy are much more complex – and require much greater effort – than material reconstruction (War-torn Societies Project, 1998b). The thrust of the peace agreements actually attempts to tackle these problems. The accords contain commitments aimed at promoting an inclusive socioeconomic development, participatory democracy, the inclusion of marginalised yet important groups in the political and economic life of the country together with a wider, more equitable access to resources and entitlements.

V.2   ECONOMIC EVENTS AND POLICIES

V.2.1   Economic Policy

Table V.1 below summarises the main economic policy developments between 1979 and 1996. As mentioned earlier, the crisis of the early 1980s together with the virtual collapse of the CACM brought an end to the

import substitution strategy. Ríos Montt government's policy to overcome the deep economic crisis focused on import restrictions, foreign exchange controls and tight credit policy. Countercyclical policies widened the budget deficit while political instability contributed to continued capital flight.

The first agreement reached with the IMF at the end of 1981 focused on a drastic reduction of the fiscal deficit (World Bank, 1996). A value-added tax (VAT) was eventually introduced in 1984 against strong opposition from various economic sectors, and the VAT rate was eventually set at 7 per cent instead of the 10 percent originally planned. A "Socioeconomic Restructuring Programme" was adopted in 1985 and focused on a gradual liberalisation of the foreign exchange market. The quetzal was officially devalued in 1985 after staying pegged to the US dollar for 58 years. Yet attempts to restore macroeconomic stability and initiate profound structural reforms in the second half of the 1980s were unsuccessful. It was not until 1991 that a standard and comprehensive economic stabilisation and structural adjustment programme was attempted, including tax reform, monetary and fiscal restraint, removal of price controls, privatisation plans, etc.

At the same time, the central bank was forced to stop financing the fiscal deficit. Monetary and credit policies were tightened, contributing to the restoration of international reserves and the reduction of inflation. GDP growth reached 4.8% in 1992. In mid-1993 however, the economic situation deteriorated again, prompted by political instability as well as a slippage in fiscal and credit policies. High political uncertainty, large movements of capital outflow and inflow as well as a drop in tourism revenue led to declining international reserves and high inflation again. The situation improved in 1995 when the government that took office after Serrano's unsuccessful *autogolpe* sought to stabilise the economy and restarted the structural reform programme.

Tabla V.2: Main economic policies and economic events, 1979 - 1996

Years Government	Main Economic Events	Fiscal Policy	Monetary and Exchange Policy	Trade Policy	External Actors (IMF)
1979-82 Lucas García government	Growth slows down. Economy enters into recession. Capital flight. Fall in tourism revenue.	Counter-cyclical policy widens the public sector deficit.	Credit policy tightened to contain inflation, capital flight and fall in international reserves. Fixed exchange rate system maintained since 1927 (1 quetzal = 1 USD).	Increased distortion from import substitution strategy. CACM crisis in 80.	IMF stand-by agreement at the end of 81, increase in interest rate required.
1982-83 Ríos Montt government	Recession. Fall in international reserves, *de facto* devaluation of the Quetzal on the parallel market.	Deficit widens. Stagnation of tax revenue and increase in expenditure (investment and defence).	Interest rate cuts at the end of 82.		IMF loans suspended several times (fiscal target off-track).
1983-85 Mejía Victores government		VAT introduced in August 83, reduced from 10 to 7 percent.	Official parallel exchange market for nonessential imports authorised as of mid-84.	Virtual collapse of the CACM. Import-export surcharge tax withdrawn under private sector pressure. Caribbean Basin Initiative launched.	IMF suspends discussions in June 84 as government refuses to increase taxation. But continued US financial assistance.
1986-88 Cerezo government	Devaluation, some price controls removed. Inflation increases.	Tax reforms approved in 86 and 87. Enforcement falls to increase tax revenues.	Adjustment policy focuses on exchange rate liberalisation (devaluation). Loose monetary policy.		No agreement with IMF.
1988-90 Cerezo government	Balance of payments crisis and hyper-inflation. Terms of trade deterioration in 90. Removal of price controls on basic items.	Public sector deficit at 4.2% of GDP in 90.	Full flotation of the exchange rate as of 89. Negative real interest rate and credit expansion. Interest rate ceilinge eliminated in August 89.	Trade liberalisation and accession to the GATT. Increase in nontraditional exports.	IMF loan at the end of 88, but World Bank declares loan ineligibility in July 89 because of six months unpaid arrears.

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Years Government	Main Economic Events	Fiscal Policy	Monetary and Exchange Policy	Trade Policy	External Actors (IMF)
1991-93 Serrano government	First comprehensive adjustment plan Incl. tax reform, monetary and fiscal restraint. Strong capital inflows.	Fiscal amnesty In 91. Tax reform in 92, leading to a successful reduction of the deficit in 92.	Real interest rate becomes positive by end-91. Central Bank prohibited from financing public sector deficit. Credit tightened up to mid-92. Exchange: daily auction floating band.	CACM revived. Promotion of nontraditional exports.	Arrears being cleaned up, IMF Standby approved in December 92 conditioned on fiscal reform and social spending. Interrupted in early 93.
1993-94 De Leon government	Capital inflows.	April 94 tax reform attempt is aborted. Fiscal deficit on the rise again. New tax reform approved in November 1994.	Tight credit policy up to mid-94. Decline in real interest rate by the end of 94.	Daily auction floating band. Further customs tariff cuts (CACM common external tariff).	IMF shadow programme resumes in March 94. Fiscal target off-track in third quarter.
1994-95 De Leon government	Upsurge in coffee prices. Mexico crisis. Reversal of capital inflows.	New tax reform ratified in April 95.	Expansionary credit policy until March 95, then monetary tightening. Rise in real interest rate.	Managed float with a quasi- fixed exchange rate.	IMF shadow programme in May 95. Monetary target off-track in third quarter.
1996 Arzu government	Privatisation of telephone and electricity companies approved.	VAT raised from 7 to 10 percent. Fight against tax evasion.	Tight monetary policy.	Floating rate. Relative stability of national currency.	

Sources: *EIU Quarterly Reviews 1979 – 1996, Inforpress Centroamericana 1979 - 1996.*

V.2.2   Socio-demographic Data

With a population of 10.2 million in 1996, Guatemala accounts for more than one third of the total population in Central America. The fertility rate in Guatemala is among the highest in Latin America (5.1 in 1995) and the population is steadily growing at an average rate of 2.9 per cent. This growth slowed somewhat in the late 1970s and early 1980s under the combined effect of escalating violence and outward migration. In 1995, 43.5 per cent was under the age of 15 and only 5.3 per cent aged over 60. Life expectancy at birth was 64.8 years in 1992. Urban population grew from 25 per cent in 1950 to an estimated 50 per cent today.

The population is divided between Ladinos – Guatemala's dominant group whose cultural affiliation is Hispanic – and indigenous peoples. The latter

comprise approximately 23 Mayan groups, speaking their own languages, which together make up about 60 per cent of the total population (EIU 1995, Wearne, 1994). Oppression and exploitation of the indigenous by the Ladino elite has often been referred to as a kind of apartheid. Indigenous peoples are concentrated in poor, rural areas and often live at the margin of the money economy. Most of them live in poverty or extreme poverty and have a very low rate of schooling[13], whereas Spanish-descended elites ("the oligarchy") have monopolised land, capital and power since colonisation (Loughna and Vicente, 1997).

V.2.3 The Economy

We refer the reader to chapter III for an analysis of the structure of the Guatemalan economy based on a social accounting matrix (SAM) which captures all economic flows in 1986. Section III.3 in particular focuses on the composition of total supply in terms of the share of major supply components for each productive sector, and on the contribution of each sector to total supply. In that section, we have further analysed how total demand is distributed among production sectors, as well as between primary (factorial) income distribution and secondary income distribution (from production factors to institutions). The objective here is different: the purpose is to present the main characteristics of the Guatemalan economy which will help us build the variables required to estimate a macroeconometric model in chapter VI. In this presentation of the Guatemalan economy, we therefore restrict ourselves to the main features relevant to the construction of the politico-economic model.

Guatemalan GDP stood at USD 15,758 million in 1996, accounting roughly for one third of Central American GDP[14]. Guatemala is a low-income economy, the GDP per capita standing at USD 1,545 in 1996. The poverty incidence is among the highest on the American continent. Around 75 per cent of the population is estimated to live below the poverty line

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[13] The literacy rate is 36.9 per cent for males and 52.9 per cent for females. School enrolment drops from 77 per cent for primary education to 21 per cent for secondary and 9 per cent for tertiary education (World Bank, 1995).

[14] Unless otherwise specified, statistical sources for socioeconomic data are the quarterly *Boletín Estadístico* of the Banco de Guatemala from 1979 to 1997, the World Bank's *Global Development Finance* statistics as well as the IMF's *International Financial Statistics*.

and 58 per cent below the extreme poverty line[15] (World Bank, 1995). In fact, extreme poverty and inequality were present long before the conflict and have been rightly pointed to as among its root causes. But 36 years later, these twin problems remain as severe as they were at the start of the conflict.

Guatemala has an extremely uneven distribution of land and income. The country ranks fourth in income inequality in Latin America, after Peru, Colombia and Mexico (World Bank, 1996). Gini coefficients calculated on the basis of the two latest socioeconomic surveys (1986 and 1989) were 0.58 and 0.59 respectively (INE, 1990). It was further estimated that the richest 20 per cent of the population received 63 percent of total income in 1989. Guatemala is the only country in Central America that has not reformed its land tenure system. Even today, the mere mention of "land reform" or "agrarian reform" in official circles spurs tensions, to say the least. The last agricultural census indicated that 2.5 per cent of Guatemala farms controlled 65 per cent of agricultural land in 1979 whereas 88 per cent of the smallest farms cultivated only 16 per cent of the total arable land.

The economy grew by an average of 5.5 per cent during the 1960s and 1970s and then stalled in the early 1980s. As shown in the table below, Guatemala plunged into a severe economic crisis in the late 1970s with negative real GDP growth rates in the first half of the 1980s. The economy showed signs of recovery in the second half of the 1980s but the GDP per capita growth rate remained extremely low until the end of the decade, after falling by about 20 per cent between 1980 and 1985. As a result, the 1996 GDP per capita expressed in constant domestic currency prices was still below the same figure for 1976.

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[15] The poverty line is drawn at the level of income sufficient to purchase a basic basket of goods and services, while the extreme poverty line refers to the amount needed to purchase a basic basket of food only.

Figure V.1: Real GDP and real GDP per capita growth rate, % change, 1960 - 1996
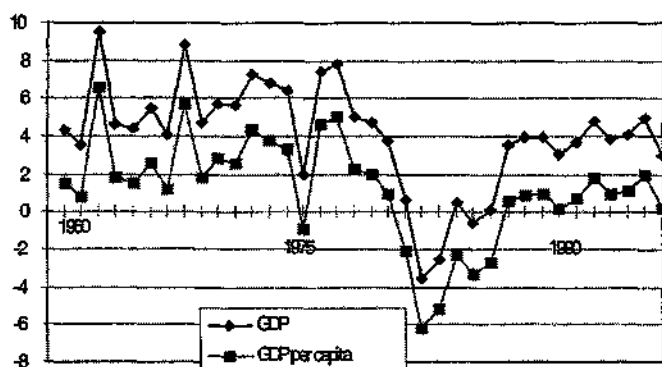
Source: *Banco de Guatemala*

The recession was marked by a sharp drop in exports, massive capital outflow, an acceleration of inflation, worsening terms of trade and the accumulation of foreign debt arrears. This was further combined with escalating political unrest in Guatemala, and a major economic and political crises across the whole of Central America. Concomitant loose fiscal and monetary policies led to large fiscal and balance-of-payments deficits, substantial external payments arrears, inflation and a marked decline in GDP and export performance.

Guatemala is a predominantly agricultural country. The economy largely relies on the abundance of low-cost indigenous labour in agriculture. As illustrated in table V.3, the sectoral composition of GDP has changed little over the past twenty years even though substantial industrialisation efforts started in the 1960s with the implementation of import-substitution policies, which encouraged the manufacture of consumer goods parallel to the creation of the Central American Common Market.

Table V.3: GDP by type of economic activity, 1980 and 1996

(Percentages of total value added)

Sector	1980	1996
Agriculture	24.8	24.0
Industry	16.6	13.9
Construction .	3.1	2.1
Commerce	27.0	24.7
Other	28.5	35.3

Source: Banco de Guatemala

Agriculture still accounts for about a quarter of GDP and for more than two thirds of merchandise export earnings, coffee ranking first. This is also confirmed by the social accounting matrix in chapter III (see table III.3). As Moran and Serra (1993) rightly pointed out, Guatemalan agriculture can be roughly divided into three categories:

* A modern sector producing traditional export goods, mainly coffee, sugar, bananas, cotton, beef and cardamom. This sector is in the hands of large-scale and technologically advanced farms located in the Pacific coastal plains and the northern slopes of the Highlands. It enjoys a relatively good access to transportation, infrastructure and credit.

* A backward subsistence sector producing staple food crops for domestic consumption: basic grains, potatoes and legumes. This sector is characterised by small and micro holdings located in the poor Western Highlands, with difficult or no access to trade-related services.

* A more recent hybrid sector producing "nontraditional" agricultural exports such as fruits, vegetables, timber, rubber and ornamental plants. These goods are produced mainly by small farms on the western slopes.

In the *manufacturing sector,* the share of capital goods and intermediate products has been growing, but remains modest compared to consumer goods production. The bulk of capital goods is imported from abroad. The biggest industries are found in the food and beverages as well as in the textile sectors. Guatemala is a net exporter to the CACM but is an overall net importer of manufactured goods. Exports to the regional market

include chemicals, plastic products, traditional textiles and shoes, whereas industrial exports to non-CACM countries tend to be of better quality and integrate more new technologies. The latter primarily consist of nontraditional export goods such as "maquila-type" textiles, agroindustrial products, furniture and other wood products. As for the *service sector*, tourism came to represent the second source of foreign currency earnings behind coffee in the early 1990s. However, tourism revenues greatly fluctuate according to the political and security situation, and are sometimes seriously affected by publicised surges in criminality and acts of violence targeted at foreigners.

Employment in the agricultural sector was 54 per cent in 1981 and 52 per cent in 1994, according to the two most recent population censuses conducted by the National Statistical Institute (INE). No more than one third of the economically active population benefits from the national social security scheme, i.e. is affiliated to the Guatemalan Institute of Social Security (IGSS). Registered *unemployment* was 2.2 per cent of the economically active population in 1980, increasing to 6.1 per cent in 1992. Yet, these figures rise to 31.2 per cent and 39.4 per cent respectively when including people between 15 and 65 not registered as economically active, notably women and indigenous people (Loughna and Vicente, 1997). The Guatemalan people have elaborated diversified coping strategies in response to endemic underemployment and hidden unemployment. Many of them have found opportunities in the informal sector, as exemplified by the numerous street vendors engaged in petty trading throughout the country.

As in many low-income countries, the *labour market* is fragmented. The urban/rural wage gap has contributed to the acceleration of rural migration towards urban centres, together with the civil war and repression that raged in northern and western provinces. The rural labour force accounted for 64.1 per cent of total labour in 1981 against 60.0 per cent in 1994 (INE, population censuses of 1981 and 1994). The urban labour market is itself segmented because of market rigidities and skill differences, mainly between industry and service workers.

Table V.4: Employment by sector, 1981 and 1994

(Percentages of economically active population)

Sector	1986	1994
Agriculture	54.0	52.6
Industry	10.5	13.0
Construction	5.1	5.8
Commerce	8.7	9.6
Transport	2.6	3.6
Other services	19.1	15.7

Source: Population census 1981 and 1994, Instituto Nacional de Estadística (INE)

As for the *capital market*, the formal sector has been highly regulated with interest rate ceilings and barriers to entry for new competitors. The deregulation process initiated in 1986 has been rather slow and modest. A vivid informal sector emerged as a means of avoiding excessive regulation of the formal banking sector, including dynamic small *financieras* that provide financial services for small projects. According to a study by the World Bank (1996), the nonformal financial intermediaries are heterogeneous but not necessarily more expensive as they charge similar interest rates to those practised by the formal financial system.

Guatemala is an open economy. The total trade/GDP ratio[16] increased from 26 per cent in 1950 to a record 50 per cent in 1977. Export and total trade ratios were around 20 per cent and 47 per cent of GDP in the mid-90s, which is high by international standards and comparable to those for outward-oriented East Asian countries (World Bank, 1997c). The economy is thus vulnerable to adverse external shocks. The United States is by far the country's largest *trading partner*. According to IaDB trade statistics for 1995, the USA provided 58.5 per cent of Guatemala's imports and received 43.6 per cent of its exports. The CACM comes second with 11.5 per cent of imports and 39.9 per cent of exports, El Salvador being the major trade partner in the region. The current account deficit is large, fluctuating between 2.5 per cent and 8 per cent of GDP in the 1990s. As shown in figure V.2, the trade deficit has enlarged since 1990 as a

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[16] The ratio is calculated by the sum of total export and import divided by GDP.

combined result of a slight appreciation of the domestic currency and booming consumer good imports following trade liberalisation measures.

Figure V.2: Exports snd Imports, In millions of US dollars
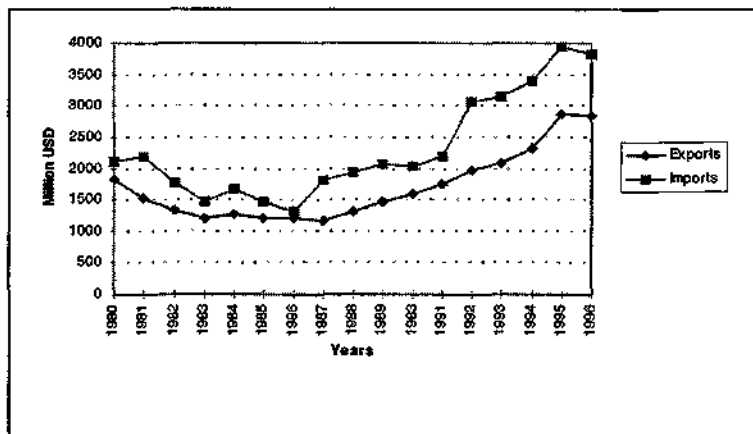
The main export products include coffee, sugar, fruits and vegetables, textiles and clothing whereas the main imports consist of capital and intermediate goods. Export diversification efforts have led to an increased expansion of the nontraditional export sector since the beginning of the 1990s, its share soaring from 47 per cent to 58 per cent of total merchandise and nonfactor service exports between 1990 and 1994 (World Bank, 1996).

When compared with other Latin American countries, inflation was kept at reasonable levels, i.e. below 20 per cent, but for three years (1985, 1986 and 1990; see table V.5 below). Access to external finance became a pressing requirement as the stock of international reserves melted from USD 741.5 million in 1978 to reach a record low of USD 112.2 million in 1982, making negotiations with the IMF necessary. Gnatemala kept a relatively manageable external debt and was thus less dependent on foreign finance than neighbouring countries. The stock of foreign debt peaked at

USD 2.47 billion in 1985, equivalent to 160 per cent of total exports that year. This ratio then improved in the following years.

Table V.5: Selected macroeconomic variables, 1979 - 1996

Years	Fiscal deficit (% of GDP)	Current account (% of GDP)	Net International Reserves (mio. USD)	Exchange rate (Qtz. For 1 USD)*	External Debt (mio. USD)	Inflation	Interest rate (lending)	Interest rate (3-month deposit)
1979	2.6	-2.56	n.a.	1	602.7	13.77	11	9
1980	4.7	-2.24	346.6	1	722.5	9.08	11	9
1961	7.4	-6.65	70	1	1092.7	8.64	15	13
1982	4.7	-4.58	-26.5	1	1372	-1.96	12	9
1983	3.3	-2.47	-65	1	1924.3	8.42	12	9
1984	3.8	-3.99	-67.2	1	2312.4	5.16	12	6
1985	1.8	-6.37	-112.4	2.67	2473.2	31.46	12	9
1986	1.5	-0.3	-3.2	2.6	2467.4	25.67	14	11
1987	1.3	-6.55	-363.6	2.52	2466.2	10.05	14	11
1988	1.4	-5.49	21.7	2.7	2340.5	10.97	16	13
1989	2.9	-6.33	-72.4	3.41	2456.9	17.94	16	13
1990	2.1	-3.9	24.7	4.92	2491.8	60.64	22.8	14.5
1991	0	-2.28	556.2	5.03	2402.8	6.17	22.1	14
1992	0	-7.01	531	5.31	2251.6	13.73	21.2	11.3
1993	1.5	-5.94	739.6	5.76	2065.9	11.64	25.7	13.3
1994	1.6	-5.3	796.4	5.63	2160.4	11.59	20.26	12.52
1995	0.6	-3.9	639.1	6.03	2107.1	8.61	22.23	14.17
1996	0.1	-3.5	815.5	5.99	2074.9	10.85	22.48	13.3

*Average buying exchange rate of the banking system, December each year.
Source: Economic Studies Department, Banco de Guatemala.

While the private sector generates around 85 per cent of GDP, the *public sector* remains particularly weak. It accounted for 8.7 per cent of total consumption in 1980 and 10.1 in 1995. The government share in gross domestic investment fell from 39.1 to 26.1 respectively (IMF Staff Country Report, 1996). The business activities of the public sector are limited to some public utilities which are to be privatised and several development-oriented financial institutions (known as "social funds").

The tax revenue to GDP ratio is the lowest in Latin America, standing at 7.9 per cent in 1996 compared to 9.2 per cent in 1980. Taxation of personal income and wealth is very weak: the share of direct taxes in total tax revenues was 24.76 per cent in 1996, this ratio being only 0.13 per cent for taxation on wealth and property. Although many economic studies have called for a major reform of the *tax system* and an end to endemic fiscal evasion, all attempts have failed so far. Partial explanation for this may be found in decades of internal war that have eroded the legitimacy and credibility of the state apparatus. The internal conflict has also perpetuated a sense of impunity for breaking the law, including vis-à-vis fiscal obligations. As underlined by Gonzales (1987: 10): "The legitimation of government tax collection is not widely accepted and there is a weak tradition for voluntary compliance." Service delivery by public employees remains poor which does not help restore taxpayer trust in public institutions. Remuneration is substantially lower than in the private sector, especially for top positions in the administration. Low wages in the public sector provide more incentives for corruption than for quality delivery services. One of the major challenges for compliance with the commitments made by the government in the peace accords, and in particular in the Agreement on Land and Socioeconomic issues[17], is to break out of the vicious circle of fiscal fraud and distrust between the taxpayer and the state.

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[17] The target is to raise tax revenue to 12 per cent of GDP from 1997 to 2000 in order to pay for peace-related expenses.

V.3 APPLYING THE POLITICO-ECONOMIC FRAMEWORK TO GUATEMALA

V.3.1 The Actors

The Government

The government includes here the politicians in power, the military and police forces as well as the paramilitary groups. In the Guatemalan case, it is the military commanders who agreed to launch a democratisation process from 1984 onwards. They managed to keep it under control and avoid any major shift in the distribution of power within Guatemalan society. At times, the military has been split between different tendencies. There has been a whole series of coup attempts, some successful and others not. Coups have traditionally not altered the balance of power in Guatemala and are thus treated in our framework as an additional factor of political instability rather than as a turning point in policy orientation.

The Social Groups

For the purpose of our politico-economic analysis, we distinguish between the following social groups:

- *Capitalists, including large landowners, agro-exporters and industrialists.* The private sector has traditionally been very close to the military and the politicians in power. It has exerted a considerable influence over economic policy-making through permanent, formal and informal, consultations with the government. The landed elite has been the most powerful group in Guatemala since the European conquest. Some authors argue that one of the major causes of the high incidence of poverty and the low level of economic development in Guatemala precisely resides in the overwhelming power of the landed oligarchy over the past decades. They contend that the politically dominant position of agro-exporters constituted a major obstacle to industrialisation as the concerns of industrialists and nontraditional exporters tended to lose out in cases of conflict of interests between them and traditional agro-exporters (Marti, 1994). From the end of the 1980s, the influence of representatives of the modern export-oriented sector has been growing and has often opposed the old protectionist

oligarchy over economic policy issues[18]. The private sector as a whole has nonetheless succeeded in remaining relatively united under a powerful umbrella organisation (CACIF).

- *Urban groups*, including labour unions, public- and private-sector workers, students and the urban informal sector. While unionised labour in the private sector has been politically vocal for many years, organised labour in the public sector was forbidden until 1986. The mobilisation capacity of the latter grew rapidly thereafter, while union leaders in the private sector were literally decimated at the beginning of the 1980s by harsh repression. The state university (Universidad San Carlos) has been a focal point of political opposition and debates. Students and professors alike have faced tough, systematic repression.

- *Rural groups*, including small landowners, farmers and rural organisations. These groups were somewhat politically divided during the war. Some actively supported the guerrilla while others enrolled in the civil defence patrols set up by the government to contain the rebels. Rural groups expressed discontent through many different ways including land occupation, protest marches onto – and demonstrations in – the main urban centres.

Interestingly, a positive outcome of 36 years of conflict in Guatemala has been the strengthening of civil society and the emergence of a myriad of grass-roots and popular organisations. Local and national NGOs have flourished, most of which with the support of international counterparts. Many co-operatives have been created and the citizenry has been mobilised at the municipal and provincial levels. The organisation of the Mayan groups was given a major impetus during the conflict in the 1980s[19]. Peasant associations became more active both in rural areas and in the capital, and families of the repression's victims also organised themselves (War-torn Societies project, 1997c).

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[18] Expansion of new economic activities at the end of the 1980s contributed to the emergence of a new fraction of the elite active in the financial sector, and in incipient export-oriented industry such as *maquila* textile production and nontraditional agricultural exports. This fraction clashed with the old state-protected oligarchy over economic policies and supported the victory of the National Action Party in 1994 (Arzu's government).

[19] The Mayan groups succeeded in attracting increasing attention and support from abroad. One of their prominent leaders, Rigoberta Menchú Tum, was awarded the Nobel Peace Prize in 1992.

The External Actors

The main external funding sources in the early 1980s were the Inter-American Development Bank, the World Bank and the USA (USAID). The United States of America was the main protagonist in the exercise of political conditionality. On a number of occasions the US Congress made bilateral assistance to Guatemala – and military support in particular – contingent upon improvements in the (appalling) human rights record and progress in the peace talks[20]. European countries also attached conditions to the provision of economic assistance in the form of improvements in human rights and peace-building.

The IMF had no programme with Guatemala in the 1980s but for short periods in 1981 and 1988. Later, the Guatemalan authorities were successful in signing three successive IMF arrangements between 1992 and 1996. Yet, the implementation of the agreements was another story: the IMF kept insisted inter alia on a profound fiscal and tax system reform, with a view to increasing fiscal revenues and the delivery of basic social services. Attempts by successive governments systematically failed in the face of political opposition by influential agro-exporters and industrialists, and violent reactions in urban centres and rural areas (demonstrations, strikes in the public sector, etc.). As a result, IMF programmes repeatedly went off-track. It is however important to note that the international financial institutions had less influence on economic policy than in other countries of the region, since Guatemala managed to keep its stock of foreign debt and its international reserves at reasonable levels.

Based on the above presentation of the main protagonists shaping economic and political interactions in Guatemala, we can tailor the generic framework illustrated in figure V.1 to the specific case of Guatemala. This is precisely what we will show in the next chapter (see figure VI.1) to illustrate the politico-economic relationships captured by the behavioural equations of our macroeconometric model as applied to Guatemala.

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[20] Even so, Guatemala was less dependent on American military support than neighbouring El Salvador and found alternative arms suppliers (e.g. Israel, Taiwan).

V.3.2 Economic and Political Optima and Conditionality

We elaborate on the basis of the model of political support presented in chapter IV. This model highlighted the gap between the optimal policy mix from a political perspective and the economic optimum in the specific context of war-torn countries. Drawing on the historico-analytical presentation above, we now discuss key politico-economic interactions in Guatemala over the past twenty years along the lines of the microeconomic considerations developed in the previous chapter.

As underlined, one of the most dramatic consequences of the Guatemalan conflict has been the erosion of social capital, coupled with a loss of credibility and legitimacy of the state. The relative price of popular support consequently increased during the civil war. To maintain its probability of survival, the political elite could either increase political expenditures and/or intensify repression. The latter option was preferred not only for political reasons, but also because the resources available to muster support were seriously constrained by weak government revenues, and the international financial institutions kept advocating for economic reform, meaning less political expenditure. Thereafter the room for repression became somewhat limited under increasing political conditionality exerted vis-à-vis Guatemala. Among the main conditions explicitly imposed by donor countries in the 1980s and 1990s, economic assistance from European countries was made conditional upon improvements in the democratisation and peace-building processes, while the Congress of the United States voted through an arms-trade embargo a number of times in order to push for clarification and punishment for gross human rights abuses (especially those involving American victims).

The severe economic recession at the turn of the 1970s reduced the stock of international reserves and made access to foreign finance a necessity. The latter was made conditional upon the introduction of orthodox economic reforms which involved a relative diminution of political expenditure and the introduction of unpopular economic measures such as increased taxation to finance basic social services as well as a tightening of the credit and monetary policy (increase in E in figure IV.9). Effective implementation of these reforms would have implied increased political opposition from powerful sectors such as the business community and public employees. The political costs of economic reform were often sensed as prohibitive in the face of continued armed insurgency and increasing peace conditionality.

Theoretically, external financial assistance could have relaxed the government's resource constraint. But this has hardly been the case. First, the absorption capacity of the public administration with regard to foreign-funded projects remained low, owing to its limited human and institutional capacities. Second, some development agencies reduced their assistance to Guatemala following repression outbursts. In addition, external actors often bypassed government channels to provide direct assistance to the civil society. As much of the aid went directly from foreign agencies to beneficiaries, the Guatemalan government did not benefit much from the provision of external assistance in the form of increased popularity (low attributability factor).

With little scope for additional repression, the government repeatedly withdrew part or all the reforms shortly after – or even before – their effective implementation. Politically motivated expenditures were also reintroduced to muster support, which would correspond to an increase in P in figure IV.9. The outcome of this dynamic has been an erratic policy-making pattern over the past two decades. This might continue to frustrate any serious modernisation attempt (e.g. fiscal reform, agrarian reform) as long as the Guatemalan authorities are not able to gather broader support for change. This requires another fundamental reform, this time in the process of policy formation itself: dialogue and consensus-building mechanisms should be promptly established to muster sufficient support for a long-term, coherent development strategy. Restoring policy dialogue between all major stakeholders is a time-consuming exercise which often takes years. This endeavour may appear incompatible with the urgency of many postconflict priorities – some of which set in the peace accords – which require quick decisions. However, we argue that it is preferable to "lose time" promoting a new culture of consensus-building and dialogue rather than to introduce sweeping reforms that are doomed to fail under the combined forces of popular discontent and opposition by the ruling oligarchy[21]. Policy dialogue mechanisms are desirable not only to improve the chances for successful economic reform. They would at the same time serve to rebuild bridges between former enemies and contribute to restore the social capital that has been torn apart by decades of distrust, violence and impunity.

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[21] The withdrawal of a new law on property tax (IUSI) shortly after its adoption by the parliament in February/March 1998 illustrates this well.

VI. ECONOMETRIC ANALYSIS OF WAR-TORN COUNTRIES

VI.1 INTRODUCTION

Politico-economic relations have long been neglected, even in the case of war-torn countries. Econometric modelling is traditionally restricted to quantitative, economic variables and does not allow for interrelations between the economy and the polity to be captured. When political factors have been introduced in macroeconometric models as *independent variables*, it has very often been in the form of dummies, although their inclusion as ordered qualitative *dependent variables* would already have been possible in the 1970s, at least at a theoretical level (see for instance Amemiya (1978 and 1979), and Nelson and Olson (1978) for references). Yet it is only very recently that the computational difficulties associated with the resolution of complex models combining both quantitative and ordered qualitative dependent variables have been addressed by econometric software packages in a simpler and user-friendly manner. Besides computational difficulties, another reason for neglecting the political dimension resides in the traditional conception of the division of labour between economics and other social sciences, whereby politico-economic interactions have been relegated outside the realm of economics.

The objective of this chapter is precisely to test a macroeconometric model that comprises both economic and political dependent variables in the context of a country case study on Guatemala, ranging from the conflict's peak to the signature of the peace accords. We expand on a politico-economic model (hereafter referred to as the "P-E model") constructed by Dessus, Lafay and Morrisson (1997), which was successfully tested on a panel of 23 African countries over the 1980s. The P-E model makes it possible to assess the influence of external actors such as the international financial institutions (IFIs) while the exercise of economic and political conditionality by the international community is often decisive for the success of a peace process. Yet Dessus, Lafay and Morrisson excluded countries at war from the panel on the grounds that the origin of armed

conflicts is not related to economic policy (e.g. interethnic tensions, conflict between military commanders).

With regard to the specification of our model, we depart from the work of Dessus, Lafay and Morrisson (1997) in several ways. First, we add specific variables related to the armed conflict and the peace process. We also include a variable on the political – or peace – conditionality exerted by major donor countries and trading partners. Second, we opt for a longitudinal rather than a cross-sectional analysis and test the model in a country case study on Guatemala. This is motivated by the recognition that generalisation is often inappropriate when dealing with conflict-ridden societies (see chapter II). Third, we switch from an annual to a quarterly frequency analysis to account for the fact that several policy shifts often occur within the same year as a result of sudden political reactions to planned reforms and the evolution of the conflict. This has required us to construct quarterly national accounts for Guatemala as well as a detailed political database ranging from 1979 to 1996, i.e. from the conflict's peak to the end of the hostilities. Fourth, our specification allows us to assess how far the inclusion of political variables improves the model's descriptive capacity compared with more traditional econometric models.

In the following pages, section 2 presents the econometric model's specification. Section 3 deals with the political and economic data sets. Section 4 elaborates on estimation issues while section 5 compares the goodness of fit of our model with equations specified along more traditional lines. Various simulations are presented in section 6 together with a discussion of estimation outputs. Section 7 concludes.

VI.2 MODELLING POLITICO-ECONOMIC INTERACTIONS

Figure VI.1, which is based on the conceptual framework outlined in figure V.1, illustrates the fundamental relationships that the behavioural equations of the macroeconometric model trace.

Figure VI.1: Economic and political relations, with specific reference to Guatemala
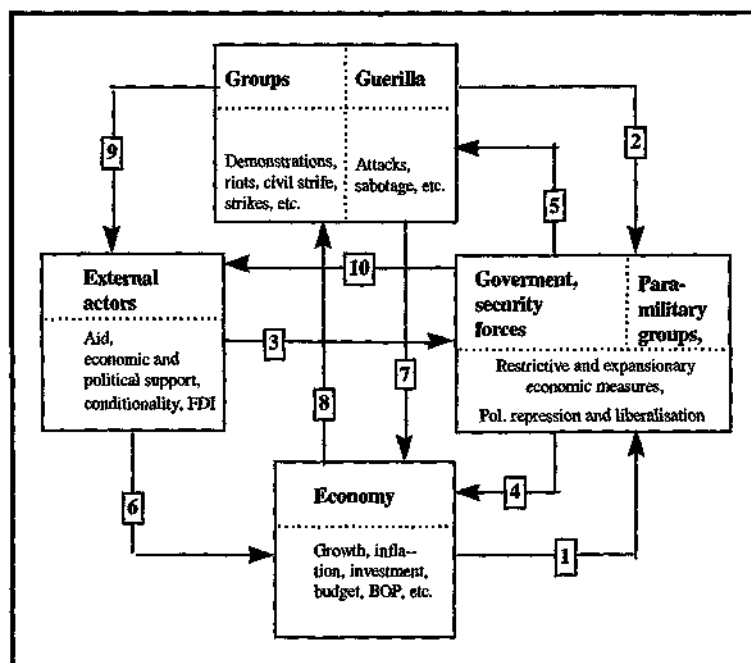
We follow the specification of the P-E model, which is a conventional macroeconomic model for a small open developing economy, with additional equations describing the interactions between the political sphere and the macroeconomic aggregates. The behavioural equations describing the economy are based to a large extent on the specification suggested by Haque, Lahiri and Montiel (1990)[22]. The model is a flexible-

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[22] These authors elaborated a macroeconometric model for a typical small open developing economy and tested it against data from 31 developing countries, including Guatemala. They found strong statistical evidence that it is an appropriate framework for macroeconomic analysis of developing countries.

price dynamic variant of the traditional Mundell-Fleming model with specific developing country characteristics. A single good is produced domestically and can be sold at home or abroad. The country is a price-taker in the market for its imports. Real gross domestic product is driven by its demand components. The price level is obtained by clearing of the market of goods, through a Phillips curve, modified with Okun's law. Following Dessus, Lafay and Morrisson (1997), we introduce the domestic political constraints facing the government as well as political repression and liberalisation measures as endogenous variables. In the case of Guatemala, the model is determined with initial conditions and the external environment which primarily consists of the intensity of conflict and insurgency activity, international interest rates, debt supply, foreign income and prices, and IMF interventions. The time lags associated with the variables result from a chronological analysis of the politico-economic cycle in Guatemala combined with the usual process of testing for different lag structures.

Arrows 1, 2 and 3 in figure VI.1 concern the government policy response to political and economic events:

- Arrow 1 shows the reactions of the government to economic conditions, e.g. restrictive economic measure to control for the deficit of the balance of payments, or to contain inflation.

- Arrow 2 focuses on the government's response to political events such as strikes, unrest, threats by the guerrilla, etc. The response may be political (repression or liberalisation), economic (e.g. relaxation of stabilisation measures to regain popular support), or a mixture of the two.

- Arrow 3 concerns the response of the government to economic and political conditions set by the international community for access to external support and funding. Economic conditionality lies in the realm of the international financial institutions and the IMF in particular. Political conditionality is usually exerted by the largest donor countries, major trading partners as well as regional political powers.

We write the above relationships (arrows 1, 2 and 3) as follows in equations 1 to 5:

$$Mn_t = \rho_0 + \rho_1 IMF_t + \rho_2 \log RM_{t-2} + \rho_3 \left(\frac{e_{t-1} P^*_{t-1} D_{t-1}}{P_{t-1} Y_{t-1}} - \frac{e_{t-2} P^*_{t-2} D_{t-2}}{P_{t-2} Y_{t-2}} \right) + \rho_4 \frac{CP_{t-1}}{CP_{t-2}} + \rho_5 Gu_t \quad (1)$$

The decision to introduce restrictive economic measures *(Mn)* depends on (i) external pressures measured as whether there is an agreement with the IMF during the period *(IMF)*, (ii) the external economic situation measured with the ratio of international reserves in terms of imports *(RM)* with one semester lag and (iii) the lagged ratio of indebtedness to GDP, where $(\frac{e_t P^*_t}{P_t})$ is the real exchange rate, *(P*)* and *(P)* standing for the foreign and domestic price level respectively, and *(e)* being the nominal exchange rate, *(D)* the real stock of external debt in foreign currency, and *(Y)* real GDP. The decision to stabilise further hangs on (iv) the inflation rate where *(CP)* reflects consumer prices. Coming to the political sphere, we assume that a surge in armed insurgency *(Gu* for Guerrilla) refrains the government from implementing unpopular or restrictive economic measures. (See section VI.3.3 for an explanation on how the data sets have been constructed, and the variables measured. See also annexe VI.1 for a presentation of all behavioural equations and accounting identities, as well as of all endogenous and exogenous variables).

$$Mp_t = \phi_0 + \phi_1 \log \frac{Y_{t-1}}{Y_{t-2}} + \phi_2 Un_t + \phi_3 Rp + \phi_4 Mn_{t-2} \quad (2)$$

It is assumed that economic growth *(Yt-1/Yt-2)* is positively correlated with expansionary economic measures *(Mp)*, which might *de facto* correspond to a withdrawal of stabilisation measures. *(Mp)* also depends on the level of civil unrest *(Un)* in the sense that a relaxation of economic policy may be a response of last resort to strikes, demonstrations, or discontent among powerful groups such as the private sector or the army when repression is not a realistic alternative. The government is further tempted to adopt short-term popular economic measures to muster sufficient support in times of political repression. Finally, a chronological analysis of economic policy-making in countries at war, such as Guatemala, suggests that the authorities often relax tight economic measures shortly after their introduction under domestic political pressures.

$$\log G_t = \Phi_0 + \Phi_1 \log Y_t + \Phi_2 \log \frac{M2_t}{P_t} + \Phi_3 \log \frac{e_{t-2} P^*_{t-2} D_{t-2}}{P_{t-2} Y_{t-2}} \quad (3)$$

Real public expenditure *(G)* is a function of government income and expenditure. It can be financed either through taxes (determined in the long run by the level of economic output *(Y)*), by printing money *(M2)*, or by borrowing abroad *(D)* which in turn is expected to depend negatively on the level of foreign indebtedness.

$$Rp_t = \chi_0 + \chi_1 Rp_{t-1} + \chi_2 Un_t + \chi_3 Co_t \tag{4}$$

$$Lb_t = \omega_0 + \omega_1 Lb_{t-1} + \omega_2 Un_t + \omega_3 Co_t + \omega_4 Cond_{t-2} \tag{5}$$

Repression *(Rp)* is the traditional response of the government to popular unrest *(Un)* and conflict *(Co)*. We add a lagged endogenous variable as repression tends to expand over several quarters once it is launched. We assume that political liberalisation *(Lb)* is negatively correlated with the intensity of civil unrest and conflict, in addition to a lagged endogenous variable. The equation further suggests a positive relationship between liberalisation and the political or peace-related conditions *(Cond)* that external actors attach to economic assistance and political support. In this respect, we assume that there is a time lag of one semester between the exercise of outside pressure and the ensuing decision on the domestic front.

Arrows 4, 5 and 6 show how the economy and the polity are shaped by government decisions, interventions by foreign actors (IMF, donors) and the external economic environment.

- Arrow 4 reflects the reaction of the economy to both economic policy and political decisions by the government. For example, inflation is expected to fall as a result of a tight monetary policy. Progress in peace-building and enhanced political stability may have a positive impact on domestic and foreign direct investment.

- Arrow 5 focuses on the response of social groups to economic and political measures. A sweeping fiscal reform may encourage capital flight. A reduction of the subsidy granted to public transportation may trigger mass demonstration and increased unrest in urban areas. Unpopular economic measures, or political repression, may reinforce the level of popular support enjoyed by the armed insurgency.

- Arrow 6 depicts the impact of foreign aid and economic conditionality on the economy. As an illustration, the evolution of demand, prices and

interest rates abroad has a direct impact on exports, inflation and debt servicing.

These relationships are written in equation form as follows (equations 6 to 13):

Real GDP *(Y)* is the sum of its demand components, public *(G)* and private *(C)* real consumption, gross domestic real investment *(I)*, and the trade balance:

$$Y_t = C_t + G_t + I_t + X_t - \frac{e_t P_t^* M_t}{P_t} \tag{6}$$

where *(X)* denotes real exports, *(e)* is the nominal exchange rate (price of foreign currency in terms of domestic currency), *(M)* is real imports measured in units of the foreign good, *(P***)* the foreign currency price of import, and *(P)* is the domestic currency price of domestic output.

The consumption per capita *(C/N)* function is specified as follows:

$$\log \frac{C_t}{N_t} = \alpha_0 + \log \alpha_1 \frac{C_{t-1}}{N_{t-1}} + \alpha_2 \log \frac{Y_t}{N_t} + \alpha_3 Mp_t + \alpha_4 Rp_t + \alpha_5 Co_{t-1} \tag{7}$$

where *(C_{t-1})* is the lagged value of consumption and *(Y/N)* the GDP per capita. Expansive economic measures adopted one quarter before the period under review has a positive impact on consumption per capita, while the reverse is expected from political instability as measured with two variables, namely violent repression *(Rp)* and lagged conflict *(Co)*.

Investment is derived from the usual flexible accelerator model, where the capital stock, *(K)*, adjusts to its desired level depending on income:

$$\log K_t = \mu \log K_t^* + (1-\mu)\log K_{t-1} \qquad \text{and} \qquad \log K_t^* = \mu' \log Y_t \tag{8}$$

The capital stock is estimated along the permanent inventory method:

$$K_t = I_t + (1-\delta)K_{t-1} \tag{8'}$$

where *(δ)* is the quarterly depreciation rate and *(I)* the total gross domestic fixed investment. The latter equation is the solution of the capital stock's law of motion which is written:

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$$K_t = \sum_{i=0}^{i=n}(1-\delta)^i I_{t-i} + (1-\delta)^n K_{t-n} \tag{8''}$$

where the second term on the right-hand side of the equation can be eliminated when n is large enough.

Coming to the behavioural equation for investment, it is important to make a distinction between investment plans and actual disbursements as they appear in national account statistics. In the context of our quarterly frequency model, the investment equation obviously does not capture changes in investment plans as the latter generally do not materialise before one or two years. The equation rather traces whether a disbursement is postponed or an investment plan is withdrawn. Bearing this in mind, we turn to the equation specification. Lagged contractionary measures *(Mn)* negatively affect investment while lagged expansionary measures *(Mp)* are positively correlated with it. High inflation discourages capital formation since it reveals economic uncertainty. The more the country is indebted, the less it can borrow on international markets to invest. A financing constraint is thus added to the flexible accelerator model, expressed by the ratio of indebtedness in foreign currency of the country, lagged one period. We assume a negative relationship between investment and political instability, consistent with the findings of recent empirical growth studies (e.g. Alesina and Perotti, 1993)[23]. Conflict *(Co)* is thus negatively correlated with investment. Common sense would dictate the same for social unrest. In the case of Guatemala however, it appears that the instability accruing from violent repression *(Rp)* is a much better explanatory variable then unrest. Together with equation (8'), investment behaviour is determined by the following equation:

$$\log K_t = \beta_0 + \beta_1 \log K_{t-1} + \beta_2 \log Y_t + \beta_3 Mn_{t-1} + \beta_4 Mp_{t-1} +$$
$$\beta_5 \log \frac{e_{t-1} P^*_{t-1} D_{t-1}}{P_{t-1} Y_{t-1}} + \beta_6 \log \frac{P_{t-1}}{P_{t-2}} + \beta_7 Rp_t + \beta_8 Co_{t-1} \tag{8'''}$$

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[23] Alesina and Perotti (1993) assessed the relationship between political violence and economic growth in a study of 70 countries over 25 years. Based on data drawn from the World Handbook of Political and Social Indicators by Taylor and Jodice (1983) as supplemented by the data set of Barro and Wolf (1989), the authors found strong evidence of a negative relationship between investment and political violence (assassinations, deaths from political violence, coups and dictatorship).

We specify the real export equation as a function of the real foreign income (Y^*) and real exchange rate $(\frac{e_t P_t^*}{P_t})$ levels. A lagged dependent variable is added to account for partial adjustment.

$$\log X_t = \gamma_0 + \gamma_1 \log X_{t-1} + \gamma_2 \log Y_{t-1}^* + \gamma_3 \frac{e_t P_t^*}{P_t} \tag{9}$$

The conventional specification for real import (M) equation states a negative relation between the real exchange rate and a positive one with the real domestic income. Expansionary economic measures are expected to increase imports while restrictive ones have the opposite effect. High levels of political violence (conflict and repression) tend to discourage imports.

$$\log M_t = \varphi_0 + \varphi_1 \log M_{t-1} + \varphi_2 \log \frac{P_{t-1} Y_{t-1}}{e_{t-1} P_{t-1}^*} + \varphi_3 Mp_{t-1} + \varphi_4 Mn_{t-1} + \varphi_5 Co_{t-1} + \varphi_6 Rp_t$$

(10)

The balance of payments identity is written as follows:

$$R_t = R_{t-1} + \frac{P_t X_t}{e_t P_t^*} - M_t + D_t - (1+i^*)D_{t-1} + NT_t \tag{11}$$

where (R) denotes real foreign reserves, (i^*) the international interest rate and (NT) the net flow of other savings[24] in constant foreign currency units.

$$\log \frac{P_t}{P_{t-1}} = +\tau_0 + \tau_1 (\log Y_{t-2} - \tau_2 \log YP_{t-2}) + \tau_3 \log \frac{P_{t-1}}{P_{t-2}} \tag{12}$$

As mentioned earlier, the value-added price is determined by clearing the goods market. Inflationary pressure intensifies when the gap between the effective and potential outputs $(Y$ and $YP)$ closes down (see Christiano, 1981; Lüscher and Ruoss, 1996). We further assume that the price level adjusts partially.

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The consumption price level *(CP)* derives from domestic and foreign prices, weighted by the share of imports in total domestic absorption.

$$\log CP_i = \Omega_i \log P_i + (1 - \Omega_i) \log e_i P_i^* \qquad \text{and} \qquad \Omega_i = \frac{C_i + I_i + G_i}{C_i + I_i + G_i + e_i P_i^* M_i / P_i} \qquad (13)$$

Arrows 7 and 8 describe the interactions between the economy and the polity. The focus here is on the reaction of the economy to political unrest as well as on the response of social groups to changes in the economic situation. In the case of countries affected by an internal conflict, it is particularly relevant to assess the relationships between political instability and peace-building on the one hand, and economic outcome on the other. Conversely, we can analyse the impact of growth on peace-building. Equation 14 (together with equations 7 and 8''' above) focuses on these relationships.

$$Un_i = \lambda_0 + \lambda_1 Mn_i + \lambda_2 \log \frac{CP_i}{CP_{i-1}} + \lambda_3 Rp_{i-1} + \lambda_4 Lb_{i-2} + \lambda_5 Un_{i-1} \qquad (14)$$

Unrest *(Un)* comprises demonstrations, strikes and coups d'état, whether successful or not. (The rationale for including coups in *(Un)* rather than introducing them as a separate variable is provided below). Unrest is positively correlated with restrictive economic measures and inflation in consumer goods prices. In the short run at least, repression is supposed to be negatively associated with social unrest while the reverse holds for lagged liberalisation. Strikes and demonstrations often expand from one sector or from a given urban centre to another. We thus add a lagged endogenous variable.

Finally, *arrows 9 and 10* denote the response of the international community to economic and political decisions by the government as well as to political events. The behaviour of external actors is treated here as exogenous to the model.

VI.3 CONSTRUCTION OF THE DATA SETS

The model consists of 11 behavioural equations and 4 accounting identities. There are 12 endogenous variables out of which 5 are qualitative ones. These figures are 12 and 3 respectively for exogenous variables. All the equations and the variables of the model are listed in annexe VI.1. This section examines the construction of our politico-economic data sets for Guatemala. The estimation of our macroeconometric model requires the construction of two distinct databases for the quantitative and ordered qualitative variables respectively. The quantitative data set contains information on the economy. The qualitative database refers to political and economic policy measures as well as to the external actors and the conflict. We first elaborate on the major difficulties related to the construction of the quantitative database and turn then to the ordering of qualitative information.

VI.3.1 The Quantitative Database

Unless otherwise specified, the economic data has been collected from the International Monetary Fund *International Financial Statistics*, the Banco de Guatemala (central bank) quarterly *Boletin Estadístico* and the World Bank *World Development Indicators* and *Global Development Finance*. The major difficulty is to estimate quarterly values for the national account aggregates that are provided on a yearly basis only (Y, C, I, P). This requires the estimation of a whole set of quarterly national accounts for Guatemala. Before expanding on this issue, we first provide a series of comments on practical difficulties related to the construction of the economic data set.

The base year for the existing Guatemalan national accounts is 1958. We derive a price deflator for each economic aggregate to express all variables in 1990 constant prices. Capital stocks statistics (K) are provided on a yearly basis until 1990 by Nehru and Dhareshwar (1994). Like these authors, we assume a 4% annual rate of capital depreciation (1% quarterly). We obtain the values for 1990-1996 with the permanent inventory method (see equation 8'). As for the variables on foreign income

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(Y*) and prices *(P*)*, we take the values of the US GDP and GDP deflator for practical simplicity. The United States is by and large the main trading partner of Guatemala. According to IaDB trade statistics for 1995, the USA provided 58.5 per cent of Guatemala's imports and received 43.6 per cent of its exports. The CACM comes second with 11.5 per cent of imports and 39.9 per cent of export, El Salvador being the major trade partner in the region.

The foreign interest rate *(i*)* is given by the average interest rate on Guatemala's external debt. As for the ratio of international reserves to imports *(RM)*, we introduce a dummy that takes the value "1" when the stock of international reserves is below the equivalent of three-month imports, which corresponds to the standard level advocated by the IMF (for reference on currency crisis indicators, see Kaminsky *et al.*, 1998). The nominal exchange rate *(e)* is the official exchange rate to the US dollar, except for 1985 and 1986 where it is a weighted average between the official and the parallel market rates[25]. Consistent with the statistics of Guatemala's central bank and the IMF, we retain a weighted average that is 2/3 of the official exchange rate and 1/3 of the parallel market rate. The latter roughly corresponds to the share of essential goods in total imports.

VI.3.2   Distribution and Extrapolation of Quarterly Data

We opt for an *indirect* estimation method that is based on a linear regression model and takes the aggregation constraint into account. More concretely, we build a best linear unbiased estimator (BLUE) of a quarterly *reference series* by *related series* based on the model presented by Chow and Lin in an article published in the *Review of Economics and Statistics* in 1971. We then use a programme developed for the software Eviews by Parnisari (Parnisari and Schwaller, 1997) to obtain quarterly data for the Guatemalan national account aggregates[26]. The estimation method suggested by Chow and Lin (1971) is reproduced in annexe VI.2.

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[25] The Guatemalan currency (quetzal) kept at par with the US dollar for 58 years. An official parallel exchange market for nonessential imports was authorised as of mid-84. Within the framework of a "Socioeconomic Restructuring Programme" adopted in 1985, the quetzal was officially devalued in 1985, leading to the full flotation of the exchange rate as of 1989.

[26] The reader is referred to Chow and Lin (1971) and Schwaller and Parnisari (1997) for a complete presentation of the model.

The quarterly explanatory variables – or related variables – have been selected according to rigorous statistical and economic criteria regarding their *indirect* relationship with the yearly aggregates for which we seek to estimate quarterly values. In the process of selecting related series, we regress the annual growth rate of the reference series on the annual growth rate of the related series. Various goodness-of-fit statistics are then used to select the best disaggregated quarterly series, on the basis of the best yearly model that we have found.

In addition to trend and cyclical fluctuations, quarterly series of the national accounts incorporate seasonal fluctuations which usually disappear at the yearly level. The discussion on whether or not to make seasonal adjustments before introducing quarterly data in an econometric model is still the subject of much debate among specialists[27]. For the sake of simplicity, we correct all our time series for seasonal fluctuations before introducing them into our models[28].

Related Variables

The related variables have been selected on the basis of standard economic theory as well as the specific characteristics of the Guatemalan economy. For example, Guatemala is not a producer of capital goods and has to import its equipment and machinery. We have thus obtained quarterly values for investment with the help of the quarterly variations in the import figures for capital goods. As for the minimal statistical criteria retained for the explanatory or related variables, we use those applied for the construction of quarterly national accounts in Switzerland. The R^2 *adjusted* between the yearly fluctuations of the reference and related variables expressed in percentage change must be greater than 0.5. The Durbin-Watson statistics shall be comprised between 0.5 and 2.5. Table VI.1 indicates for each reference variable (column 1) which related variable has been retained to estimate quarterly values. The table also provides the

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[27] Until the end of the 1980s, the common practice was to make prior seasonal adjustments. It has then been recognised that all adjustment methods are not neutral and introduce artificial short-term fluctuations in the data. As a result, econometricians have introduced dummies to account for seasonal variations or more complex modelisation (trigonometric for instance, with additional stochastic components). Yet dummies are no perfect solution as they cannot capture the stochastic components of seasonal variations.

[28] We use the CensusX.11 method developed by the US National Statistical Office to correct the time series for seasonal fluctuations.

coefficient of determination adjusted (R^2 *adj.*), the probability associated with the t-statistic (*Prob.*) and the Durbin-Watson Statistics (*D-W*).

Table VI.1: related variables

R^2 adj., t-statistic (Prob.) and Durbin-Watson (D-W)

Ref. Variable	Related Variable	R2 adj.	Prob.	D-W
Private Consumption	Imports of nondurable goods	0.5208	0.0170	0.7150
Public Consumption	Consumption of the central government	0.7802	0.0001	2.0878
Investment	Imports of capital goods	0.6373	0.0001	1.2017
GDP deflator	Consumer price index	0.9558	0.0001	2.4837
Export deflator	GDP deflator	0.8322	0.0001	1.9102
Import deflator	Export deflator	0.7423	0.0001	2.4402

The quarterly values of the Guatemalan gross domestic product are then calculated by summing the quarterly values of its demand-side components (see equation 6 above). A detailed presentation of the quarterly national accounts for Guatemala is provided in the table that follows (table VI.2).

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Table VI.2: Guatemalan quarterly national accounts, 1979 – 1996

(In million quetzales of 1990)

Quarter	Real GDP	Private Consumption	Gvt Consumption	Investment	Exports	Imports	GDP Price Defl.
1979:1	7'369.15	5'975.76	432.91	1'911.82	1'811.27	3'001.45	0.22
1979:2	7'607.23	6'133.65	414.60	1'773.00	1'999.14	2'965.13	0.22
1979:3	7'507.84	6'242.25	406.42	1'462.47	2'249.40	2'731.64	0.23
1979:4	7'834.60	6'285.59	334.72	1'242.37	1'761.87	2'741.60	0.24
1980:1	7'953.31	6'210.79	448.36	1'404.17	2'024.10	2'969.47	0.24
1980:2	8'068.32	6'369.24	426.56	1'314.88	2'528.08	2'456.12	0.25
1980:3	7'724.63	6'415.42	459.60	1'407.47	2'148.20	2'647.94	0.25
1980:4	7'708.78	6'402.32	437.69	1'273.73	1'534.17	2'374.93	0.26
1981:1	7'980.93	6'386.91	456.53	1'460.23	2'065.61	2'507.20	0.26
1981:2	8'148.00	6'451.33	467.74	1'615.26	1'767.44	2'279.01	0.27
1981:3	7'794.78	6'507.27	461.44	1'720.58	1'565.12	2'801.89	0.27
1981:4	7'740.73	6'449.42	463.91	1'435.81	1'534.71	2'375.41	0.28
1982:1	7'673.26	6'315.22	496.06	1'233.21	1'722.37	2'036.46	0.28
1982:2	7'840.86	6'271.71	441.35	1'230.40	1'598.47	1'947.43	0.29
1982:3	7'525.29	6'274.85	435.72	1'101.10	1'544.72	1'774.47	0.29
1982:4	7'501.36	6'259.03	451.08	1'475.00	1'614.63	2'131.46	0.29
1983:1	7'265.75	6'187.27	473.44	1'018.87	1'454.01	1'528.10	0.29
1983:2	7'559.76	6'201.89	460.19	1'155.55	1'374.85	1'568.94	0.30
1983:3	7'366.00	6'229.19	470.15	930.07	1'496.68	1'570.16	0.32
1983:4	7'570.01	6'242.41	455.34	1'083.55	1'484.79	1'648.23	0.31
1984:1	6'916.76	6'249.09	487.77	1'038.80	1'575.43	1'836.15	0.31
1984:2	7'482.45	6'276.58	465.95	1'322.94	1'416.48	1'961.74	0.32
1984:3	7'580.87	6'274.33	457.69	1'177.48	1'363.26	1'493.45	0.31
1984:4	7'922.56	6'242.53	465.73	925.44	1'227.39	1'438.49	0.33
1985:1	7'691.80	6'230.17	508.86	1'177.16	1'845.56	1'775.90	0.33
1985:2	7'682.66	6'240.55	421.49	675.33	1'470.21	1'491.65	0.35
1985:3	6'919.09	6'217.64	458.11	827.50	1'184.67	1'342.01	0.40
1985:4	7'432.08	6'170.83	454.92	776.79	1'271.63	1'243.98	0.43
1986:1	7'166.72	6'150.97	461.33	673.63	1'036.21	910.02	0.47
1986:2	7'337.21	6'245.65	434.65	802.14	1'005.61	1'103.51	0.53
1986:3	7'765.25	6'375.33	583.32	1'192.22	1'269.96	1'576.55	0.56
1986:4	7'506.12	6'455.15	472.24	905.24	1'706.47	1'432.75	0.57

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Quarter	Real GDP	Private Consumption	Gvt Consumption	Investment	Exports	Imports	GDP Price Defl.
1987:1	7'830.46	8'501.77	483.68	978.96	1'438.14	1'576.14	0.57
1987:2	7'686.71	8'517.65	496.87	1'269.90	1'446.17	2'057.39	0.57
1987:3	7'466.79	6'532.30	541.33	1'296.38	1'236.62	1'875.34	0.58
1987:4	7'836.48	6'612.69	544.14	1'205.26	1'227.96	1'872.28	0.59
1988:1	7'826.82	6'706.29	493.60	1'327.61	1'176.68	1'765.34	0.61
1988:2	7'990.56	8'774.79	626.31	1'261.57	1'061.44	1'953.24	0.62
1988:3	8'056.63	6'629.41	456.76	1'073.33	1'503.56	1'906.95	0.66
1988:4	8'145.92	6'917.14	591.55	1'070.02	1'632.64	2'172.66	0.67
1989:1	8'099.73	6'994.55	572.06	1'212.08	1'837.01	2'290.14	0.68
1989:2	8'261.01	6'990.30	562.54	1'166.25	1'739.27	2'219.83	0.69
1989:3	8'256.91	6'978.29	518.21	1'184.24	1'477.71	1'791.42	0.71
1989:4	8'667.02	7'019.32	602.20	1'173.01	1'515.26	1'885.66	0.76
1990:1	8'880.29	7'086.03	568.98	1'340.91	1'622.34	2'117.87	0.83
1990:2	8'389.89	7'141.75	577.83	1'092.09	1'633.52	1'927.19	0.94
1990:3	8'733.22	7'165.48	533.96	1'076.36	1'811.13	2'005.40	1.05
1990:4	8'313.43	7'269.80	647.94	1'182.94	1'871.95	1'996.90	1.19
1991:1	8'645.88	7'384.86	609.22	1'244.45	1'649.36	2'156.62	1.30
1991:2	8'815.68	7'414.61	564.11	1'369.84	1'571.10	2'111.63	1.32
1991:3	8'893.19	7'472.85	582.96	1'472.50	1'601.64	2'136.46	1.34
1991:4	9'038.62	7'584.50	706.01	1'652.50	1'933.83	2'305.31	1.35
1992:1	9'220.58	7'722.08	589.48	1'740.62	1'856.61	2'493.48	1.37
1992:2	8'895.52	7'767.63	651.77	1'790.22	1'696.59	2'730.34	1.42
1992:3	9'387.30	7'824.33	613.37	1'726.34	1'917.29	3'258.80	1.47
1992:4	9'790.74	7'919.66	647.30	2'148.01	1'969.72	3'408.51	1.53
1993:1	9'512.74	8'026.60	677.11	1'833.81	1'681.97	3'089.78	1.58
1993:2	9'324.90	8'092.13	682.55	1'619.50	1'821.00	2'893.88	1.65
1993:3	9'906.41	8'164.77	716.53	1'654.86	2'074.41	3'170.31	1.68
1993:4	9'994.27	8'290.69	629.53	1'893.85	1'957.70	3'330.18	1.71
1994:1	9'362.56	8'415.47	666.84	1'757.04	1'598.82	2'971.62	1.78
1994:2	10'049.46	8'493.41	713.35	1'723.05	1'965.72	3'339.70	1.83
1994:3	10'608.05	8'581.72	752.00	1'775.98	2'159.19	3'221.00	1.87
1994:4	10'312.00	8'722.49	647.69	1'845.70	2'104.36	3'338.07	1.93
1995:1	11'003.93	8'696.21	693.63	1'808.34	2'364.16	3'761.65	1.94
1995:2	10'351.19	8'983.30	669.24	1'714.28	2'149.93	3'592.80	1.99
1995:3	10'852.77	9'012.88	726.45	1'768.47	2'217.46	3'418.45	2.03

Quarter	Real GDP	Private Consumption	Gvt Consumption	Investment	Exports	Imports	GDP Price Defl.
1995:4	10'309.43	9'090.25	697.27	1'738.48	2'113.88	3'303.93	2.09
1996:1	10'987.62	9'197.02	667.59	1'611.89	2'438.57	3'575.84	2.12
1996:2	10'586.66	9'211.21	767.38	1'418.83	2'487.35	3'428.22	2.16
1996:3	10'913.91	9'204.08	708.73	1'376.49	2'331.27	2'936.70	2.22
1996:4	11'077.59	9'225.03	707.70	1'469.13	2'319.44	3'112.49	2.27

VI.3.3   The Qualitative Database

Empirical studies on politico-economic interactions have concentrated on cross-sectional studies comparing different countries over one or several years. Measures of political variables for developing countries are scarce or nonexistent. The main data set used in empirical literature on political violence and economic growth is the *World Handbook of Political and Social Indicators* by Taylor and Jodice (1983). The main reference for empirical research on armed conflict and growth is the *Correlates of War Project: International and Civil War Data* by Singer and Small (1994). In addition, several researchers constructed their own political database on the basis of a systematic review of the economic and political information published in newspapers or in weekly/monthly magazines (e.g. Paldam, 1995).

We follow the latter approach and build an ad hoc politico-economic database for Guatemala through a detailed and systematic analysis of the quarterly *Country Report* of the Economist Intelligence Unit (EIU), supplemented with the monthly *Central American Report* of Inforpress Centroamericana (IC) when necessary. The EIU reports provide systematic information on the main political events, on economic policy decisions and on the evolution of the economy. The IC reports are summary English version of the weekly *Boletines* published in Spanish also by IC. They focus on political affairs, social and labour issues and the economy[29]. As

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[29] In addition to country-specific information, both sources contain information on Central America as a whole.

for specific indicators on the conflict and political violence, we consulted several sources providing statistics for and analysis of the civil war, i.e. the Commission for Historical Clarification (CEH, 1999), the Human Rights Office of the Archbishopric of Guatemala (REMHI, 1998), the American Association for the Advancement of Science (Ball, 1999), and yearly statistics from the UN High Commissioner for Refugees.

We first collect five sets of data on political measures and economic policies:

- *Economic measures* are classified as either expansionary *(Mp)* or restrictive *(Mn)* depending on whether they are popular or unpopular with a given social group, several groups or the society as a whole. We distinguish primarily between three groups: capitalist, urban workers and rural workers. In Guatemala, *(Mn)* comprises for instance repeated tax reform attempts aimed at increasing government revenues. These reforms were often withdrawn a few months later *(Mp)* against strong opposition from various sectors. The following examples further illustrate the spectrum of measures considered here: a tightening of monetary policy or the introduction of a new consumption tax are taken to be unpopular with all economic agents. A subsidy cut raising the price of public transportation in Guatemala City is unpopular with the urban group. The introduction of a special tax on capital income is deemed to affect the interests of capitalists. The lifting of price controls on basic food items is particularly unpopular with the urban group, whereas an increase in public sector wages is a popular measure with this group. An increase in export taxes on coffee meets with opposition from agro-exporters (capitalists).

- *Interventions by foreign actors* are primarily captured by the provision of external assistance and the conditions attached to it. Economic conditionality *(IMF* in the model) refers to stand-by and shadow stand-by agreements with the IMF as well as to the opening and closing of credit lines on the basis of explicit economic policy targets. Political conditionality *(Cond)* traces peace-related or political targets set by Guatemala's major trading partners and aid providers, i.e. the USA, European countries and the UN. Conditions include clarification of human rights abuses, progress in the peace process, democratisation, etc. For example, the US Congress insisted on several occasions on improvements in the (appalling) human rights record as a condition for lifting the American arms trade embargo.

- *Conflict and political violence (Co)* involves a combination of battle-related deaths, extra-judicial killings, disappearances and the number of Guatemalan refugees registering in neighbouring countries[30]. *(Gu)* reflects a surge in armed insurgency.

- *Political instability (Un)* comprises demonstrations (whether for political or economic reasons), strikes (incl. private and public sector, schools and universities), land occupation etc. In the case of Guatemala, we add coup attempts – whether successful or not – as an additional factor of political instability. For coups have traditionally not altered the balance of power in Guatemala. They add to the political instability as they reveal internal struggles within the army and/or the political elite, but cannot be associated with turning points in policy orientation as is the case in other countries.

. *Political measures* are categorised under repression *(Rp)* and liberalisation *(Lb)*. They concern all legal decisions that restrict or expand civilian liberties as well as violent acts by governmental forces against political opponents. In Guatemala, repressive measures for instance include prohibition of political parties, state of emergency, incarceration or elimination of political and labour union leaders, prohibition of strikes, etc. The opposite measures fall under liberalisation, which also includes substantive progress in the peace process.

. Each economic or political measure and event is coded into binary or ordered qualitative indicators. The information related to exogenous variables in the model serves for the construction of dummies. The data corresponding to dependent variables is coded along a four-step scale (from 0 to 3) depending on its occurrence and intensity[31]. We then aggregate this ordered qualitative data in different composites corresponding to the model's variables described above. Following Dessus, Lafay and Morrisson (1997), the resulting aggregates are then re-scaled in new composites according to an arbitrary rule: (i) if the

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[30] The final report of the Commission for Historical Clarification (1999) was released at the time our study was concluded. The detailed monthly statistical information provided on the Guatemalan conflict confirms the adequacy of our qualitative variable related to the conflict *(Co)*. It would further allow us to construct a quantitative variable on the conflict for future analysis.

[31] This ordering method implies that a strike or a restrictive economic measure coded 2 has a higher occurrence or a larger impact that the same event coded 1, but does not indicate in any way that the former is twice as intense as the latter.

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aggregate equals 0, then the composite equals 0; (ii) if the aggregate equals 1 or 2 then the composite equals 1; (iii) if the aggregate equals 3 or 4 then the composite equals 2; and (iv) if the aggregate is strictly greater than 4, we assign a value of 3 to the composite.

The main weakness of this method is that the ordering of qualitative data is in essence a subjective process. Yet, this is compensated by several factors. First, all events have been coded by the same researcher, i.e. according to the same subjective criteria over the whole period and for all variables. Second, the data has been collected from a very limited number of regular publications which provide chronological information on all major political and economic events and measures in a systematic and consistent manner. Third, and more importantly, our approach focuses on the subjective perceptions of key actors on policy decisions and politico-economic events, to the extent that the publications from which we draw our indicators also help shape their judgement. Recent studies on politics and growth have precisely concluded that subjective perceptions are a better explanatory variable than objective, quantitative data when assessing politico-economic interactions (e.g. Brunetti, 1997)[32].

VI.4   ESTIMATION

The overall model consists of equations 1 to 14 except equations 8 and 8''. Equations 6, 8', 11 and 13 are accounting identities while the other equations are to be estimated. Following the method used for the P-E model, our model is estimated in two stages. First, we regress the *quantitative variables* on a set of instruments comprising lagged

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[32] Brunetti (1997) reviews the empirical links between economic growth and five categories of political variables, namely democracy, government stability, political violence, policy volatility and subjective perception of politics. The author concludes that measures of democracy are least successful as explanatory variables in cross-country growth regressions, whereas measures of policy volatility and subjective perception of politics are most successful. The best criteria does not reflect any objective measure of political stability but is based on the subjective perception of the agents that make the growth-relevant decisions. The author further highlights two major methodological problems related to cross-section regression surveys. First, there is a problem of "simultaneity", as the usual ordinary least square (OLS) regressions used in most empirical studies do not reveal the direction of causation. Authors generally assume that the political process determines the growth rate, but some theoretical arguments indicate that the direction of causation could be the other way round. The second problem relates to the robustness of the econometric results to variations in the specification of the growth equation.

endogenous variables, exogenous and lagged exogenous variables with ordinary least squares. Contemporaneous and lagged *qualitative variables* are regressed on the same set of instruments using the ordered probit model. The presence of endogenous qualitative ordered variables requires the model to be estimated with the maximum likelihood method. We then estimate the structural equations with the quantitative predictors of both quantitative and qualitative variables as the explanatory variables in the equations with two-stage least squares. We refer to Dessus, Lafay and Morrisson (1997) for an exhaustive presentation of the estimation issues.

The particularity of this method is that the qualitative ordered information is quantified. The quantitative predictors of ordered qualitative variables can be introduced as explanatory variables in the other equations. The standard error of the predictors is not estimable and is normalised to unity. Consequently, only the sign of the estimated parameters of linear predictors can be interpreted, not their absolute value. This is not the case of the t-statistics and probabilities associated with the discrete values which can be directly interpreted as they do not depend on the hypothesis for the variance of the predictors. The estimated parameters are unbiased and asymptotically normal.

The quality of the overall model is evaluated with the adjusted coefficient of determination ($\overline{R}^2$). This measure is however inappropriate to test the fitness of the qualitative equations, i.e. to assess the extent to which the estimated model respects the ordinal distribution of the qualitative variable. In such cases, we compare actual and fitted values by calculating the concordance rate, which is the ratio of the number of concordant pairs of observation on the total number of pairs[33]. We test the quality of each parameter with the Wald and maximum likelihood ratio tests[34].

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[33] The concordance rate is given by the following equation: if i and j are the discrete values for two observations and $i \neq j$, a pair of observations is concordant if and only if:

$(i < j$ and $\hat{y}_i^* < \hat{y}_j^* - \varepsilon)$ or $(i > j$ and $\hat{y}_i^* > \hat{y}_j^* + \varepsilon)$

where y^* is the fitted value of the linear quantitative predictor and $\square$ is the 5% confidence interval for y^*.

[34] Our objective here is not to discuss at length on the estimation method. We thus opted to apply the approach developed by the OECD Development Centre as such and do not here specifically control for serial autocorrelation of errors.

VI.4.1   Estimation Output

The model generally fits the data well. All the estimates are of the expected sign, except for the coefficient on foreign indebtedness in the government consumption equation, which is explained by the relatively low level of Guatemalan external indebtedness throughout the period considered. The eleven structural equations all satisfy the maximum likelihood ratio test of global significance at the 0.01 level. Our estimation outputs confirm to a very large extent the results obtained by the P-E model in a horizontal study on 23 African countries over the 1980s. Our results suggest that the politico-economic approach is well suited for the econometric analysis of conflict-ridden countries such as Guatemala. These results are presented and interpreted below as well as in section 5 hereafter.

Table VI.3 reports for each equation the R^2 adjusted – or the concordance rate (Cr) – depending on the nature of the dependent variable. In parentheses, we find the p-value for the parameter estimations. Most of the parameters are significantly different from zero at conventional levels. As one could expect, the probability associated with a few parameters on quantitative economic variables lies above 5 per cent. This comes as no surprise as the behavioural equations describing the economy have been directly drawn from the P-E model which was constructed for a "typical, small, open, developing economy," not specifically for Guatemala. For these few cases, specific features of the Guatemalan economy provide an explanation for the weak statistical significance of the parameter, as discussed below. The same applies to the parameters on qualitative variables which are statistically significant at the 95 per cent level in 19 cases out of 27.

Table VI.3: Estimates of structural parameters

Variable	Parameter	Tests
Restrictive Economic Measures		*Cr=0.6996*
IMF intervention	$\rho_1 = 0.3541$	(0.0209)
Lagged ratio foreign reserves/imports	$\rho_2 = 0.1401$	(0.5922)
Lagged change in indebtedness ratio	$\rho_3 = 2.7797$	(0.0001)
Lagged inflation	$\rho_4 = 7.6714$	(0.0274)
Guerrilla activity	$\rho_5 = -1.0893$	(0.0001)
Expansionary Economic Measures		*Cr=0.7409*
Lagged GDP growth	$\phi_1 = 1.1221$	(0.6178)
Unrest	$\phi_2 = 0.5485$	(0.0001)
Repression	$\phi_3 = 1.4654$	(0.0008)
Lagged restrictive economic measures	$\phi_4 = 0.1882$	(0.1495)
Government Consumption		*R²=0.819*
Gross domestic product	$\Phi_1 = 1.1581$	(0.0001)
Money supply	$\Phi_2 = 0.1024$	(0.3738)
Lagged indebtedness ratio	$\Phi_3 = 0.1322$	(0.0001)
Political Repression		*Cr=0.6556*
Lagged endogenous variable	$\chi_1 = 0.6067$	(0.0001)
Unrest	$\chi_2 = 0.0212$	(0.3719)
Conflict	$\chi_3 = 0.0146$	(0.0448)
Political Liberalisation		*Cr=0.7883*
Lagged endogenous variable	$\omega_1 = 0.3161$	(0.0071)
Unrest	$\omega_2 = -0.1739$	(0.0111)
Conflict	$\omega_3 = -0.5140$	(0.0273)
Lagged political conditionality	$\omega_4 = 0.5986$	(0.1619)
Per Capita Private Consumption		*R²=0.987*
Lagged endogenous variable	$\alpha_1 = 0.8950$	(0.0001)
GDP per capita	$\alpha_2 = 0.0732$	(0.0209)
Expansionary economic measures	$\alpha_3 = 0.0008$	(0.2074)
Repression	$\alpha_4 = -0.0086$	(0.0383)
Lagged conflict	$\alpha_5 = -0.0021$	(0.2745)

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Table VI.3 (continued): Estimates of structural parameters

Variable	Parameter	Tests
Capital formation		$R^2=0.999$
Lagged endogenous variable	$\beta_1 = 0.9647$	(0.0001)
Gross domestic product	$\beta_2 = 0.0318$	(0.0002)
Lagged restrictive economic measures	$\beta_3 = -0.0008$	(0.0351)
Lagged expansionary economic measures	$\beta_4 = 0.0007$	(0.0137)
Lagged indebtedness ratio	$\beta_5 = -0.0218$	(0.2614)
Lagged inflation	$\beta_6 = -0.0219$	(0.0517)
Repression	$\beta_7 = -0.0033$	(0.0194)
Lagged conflict	$\beta_8 = -0.0018$	(0.0074)
Exports		$R^2=0.620$
Lagged endogenous variable	$\gamma_1 = 0.7546$	(0.0001)
Lagged foreign income	$\gamma_2 = 0.1828$	(0.2728)
Real exchange rate	$\gamma_3 = 0.0418$	(0.3305)
Imports		$R^2=0.859$
Lagged endogenous variable	$\varphi_1 = 0.8323$	(0.0001)
Domestic income	$\varphi_2 = 0.2003$	(0.0990)
Lagged expansionary economic measures	$\varphi_3 = 0.0029$	(0.0309)
Lagged restrictive economic measures	$\varphi_4 = -0.0090$	(0.6408)
Lagged conflict	$\varphi_5 = -0.0529$	(0.1786)
Repression	$\varphi_6 = -0.1690$	(0.0318)
Price of value added		$R^2=0.422$
Gross domestic product	$\tau_1 = 0.1209$	(0.3395)
Potential output	$\tau_2 = 1.0433$	(0.0001)
Lagged endogenous variable	$\tau_3 = 0.8389$	(0.0001)
Unrest		$Cr=0.7667$
Restrictive economic measures	$\lambda_1 = 0.2406$	(0.0409)
Inflation (consumption price)	$\lambda_2 = 2.2063$	(0.6522)
Repression	$\lambda_3 = -1.8799$	(0.0002)
Lagged liberalisation	$\lambda_4 = 0.4422$	(0.0527)
Lagged endogenous variable	$\lambda_5 = 0.6516$	(0.0001)

Note: Only the signs of the estimated parameters related to linear predictors of ordered qualitative variables can be interpreted, but not their absolute value.

Our estimation outputs confirm to a very large extent the results obtained for the P-E model. We limit ourselves to the main differences between our results for Guatemala and those of the P-E model for a panel of 23 African countries:

The decision to stabilise *Mn* primarily derives from balance of payments constraints and the aggravation of indebtedness. In the Guatemalan case however, the parameter on the reserves/imports ratio is not statistically significant (p-value of 0.6), as the country was able to avoid the type of foreign currency crisis experienced by African countries in the 1980s. But there is a strong positive correlation between lagged inflation and restrictive economic policy in the case of Guatemala, reflecting a deep concern for price stability among the political elite in the country. To remain close to the original P-E Model, we do not attempt to exclude non significant variables from the model in this study.

Public consumption expenditures depend on gross domestic product via fiscal revenues, money creation and the level of external indebtedness. Contrary to results obtained for the P-E model, foreign debt is positively correlated with government expenditures. This is explained by the fact that Guatemala succeeded in keeping its stock of foreign debt at a lower level than many African countries, with a total debt service remaining below 6 per cent of GNP, or one third of total exports, over the whole period under review. The explanation also resides in the fact that Guatemala has the lowest government expenditure to GDP ratio in Latin America (between 6% and 9%). Conditions attached to foreign grants thus concentrated more on raising fiscal revenue than on curbing public spending.

When testing for the effect of restrictive economic policy on private consumption, the correlation is totally insignificant for Guatemala. This confirms that reform attempts were systematically withdrawn or altered before substantially affecting consumption. The variable *Mn* was consequently not introduced in the consumption equation.

In the estimated capital formation function, the negative impact of external indebtedness on investment is not as severe as one would expect from theory. Once again, this can be explained by the reasonable level of external indebtedness.

The long-term elasticity of export demand with respect to foreign income and the impact of changes in relative prices, is somewhat small. This may be due to the fact that foreign income and prices are limited to the US GDP and dollar, the United States being Guatemala's main trading partner (58.5 per cent of total imports and 43.6 per cent of total exports in 1995).

Lagged restrictive economic policy does not appear to be significantly correlated with imports (statistically different from zero at the 76 per cent level). This indicates that reform attempts failed to substantially reduce external imbalances to the extent that restrictive economic measures were often relaxed shortly after their implementation.

Finally, the coefficient on lagged unrest shows that turmoil often spreads over several quarters. As is well documented, demonstrations and strikes have contagious effects and tend to expand from one sector or a given urban centre to another.

VI.5 COMPARISON ACROSS MODELS

This section assesses the merit of the politico-economic approach versus more traditional quantitative analysis of war-torn economies. To this end, we consider all the quantitative dependent variable equations in the model we presented above that are specified with both quantitative and ordered qualitative explanatory variables, i.e. the consumption, investment and import functions (here we call this model as presented earlier "Model I"). We then compare their goodness of fit with the same three equations from which we exclude the ordered qualitative variables (Model III) and then also the dummies (Model II). The descriptive capacity of the models is evaluated with two forecast error statistics: the root mean squared error (RMSE) and the Theil inequality coefficients (Theil Coef.). The value of the RMSE depends on the scale of the dependent variable and is used as a relative measure to compare forecasts for the same series across different models: the smaller the error, the better the performance of that model. The Theil coefficient is scale invariant and always lies between zero and one, zero indicating a perfect fit. The R^2 adjusted is also given for information.

As shown in table VI.4, the RMSE and the Theil inequality coefficients are smaller for Model 1 than for the two others, meaning that our politico-economic model has the strongest descriptive capacity. Note also that the

Theil inequality coefficient lies below 0.01 for the three equations in model I. Model III fares second while Model II has the highest – or the worst – values for both RMSE and the Theil coefficient. This implies that the inclusion of ordered qualitative dependent variables concerning the politico-economic cycle improves the model, and that the dummies very substantially reinforce its performance. Yet this may be partly explained by the usual fact that the more variables in the model, the better the fit.

Table VI.4: Goodness of fit of the three equations with quantitative dependant variables and ordered qualitative explanatory variables

Coef.	R² adjusted	RMSE	Theil
Per Capita Private Consumption			
Model I	0.9875	142.89	0.0098
Model II	0.9874	200.45	0.0140
Model III	0.9861	143.05	0.0099
Capital formation			
Model I	0.9998	530.54	0.0033
Model II	0.9997	1240.83	0.0077
Model III	0.9996	591.19	0.0037
Imports			
Model I	0.8591	296.58	0.0628
Model II	0.8405	749.62	0.1580
Model III	0.8148	382.01	0.0795

Note:
Model I: politico-economic model with quantitative, dummy and ordered qualitative variables.
Model II : traditional economic model with the quantitative economic variables only.
Model III: mixed model with quantitative economic variables and dummies (*IMF, Gu, Co*).

VI.6   SIMULATIONS

Running simulations on the basis of our macroeconometric model can provide interesting indications of the impact of a series of short-term exogenous shocks on the economy and the polity. We simulate two types of interventions by external actors to assess the implications of economic conditionality and peace-related or political conditions for both the economic and political spheres. As for the first simulation, the initial shock is introduced by giving the value "1" to the dummy variable on economic conditionality (*IMF* in equation 1 of the model)[35]. We then run the simulation over twelve quarters and report the differences between the original values and the simulation outputs in figures VI.2 and VI.3. These differences capture the direct and indirect effects of the external shock under the ceteris paribus assumption. They are technically equivalent to traditional multipliers except that only the direction of change can be interpreted, not the magnitude (see below). The same applies to figures VI.4 and VI.5 which illustrate the effects of an increase in political conditionality (*Cond* in equation 5).

The interpretation of the simulation outcome requires some caution:

- Changes in real GDP only reflect short-term fluctuations on the demand side. The simulations do not capture long-run growth effects that would result from shifts in supply, which explains why the model returns to its steady state a few periods after the initial shock (Dessus, Lafay and Morrisson, 1997). The model's short-term bias derives from the very purpose of our study, which is to trace short-run politico-economic interactions during the transition from war to peace. We consequently run the simulations over three years only and focus our attention on the reactions taking place within the four quarters after introducing the shock.

- Our model is not a quantitative forecasting model. The simulation outputs indicate in which direction the endogenous variables fluctuate, but do not provide information about the magnitude of these fluctuations. For, as noted above, only the signs of the estimated parameters of the predictors calculated for the ordered qualitative

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[35] IMF interventions are treated here as exogenous shocks, contrary to a growing body of literature that treat them as endogenous reactions.

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variables can be interpreted, not their absolute values. To reflect this limitation, we introduce two different scales in figures VI.2 and VI.4. The left scale refers to GDP variations *in percentage points* and the right one to ordered qualitative variables, i.e. restrictive and expansionary measures, political unrest, repression and liberalisation. The corresponding curves show how these variables vary *in absolute values* following the external shock[36]. As only the signs of these values can be interpreted, we place positive and negative signs on the right scale to indicate the directions of change. Logically, the same holds for the left scale in figures VI.3 and VI.5.

Figures VI.2 and VI.3 reflect well the politico-economic dynamics observed in Guatemala over the past 20 years. They highlight fundamental politico-economic interactions following an intervention by the IMF in the form of a stabilisation measures advocated under stand-by agreements. The interactions between the economic and political spheres thus help explain why economic reform attempts have repeatedly failed or have been withdrawn shortly after their introduction in the case of Guatemala.

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[36] Reporting simulation outputs in percentage points for the predictors of the ordered qualitative variables would make no sense as their absolute value level has been determined by the set of instruments introduced in the probit model.

Figurea VI.2 and VI.3 - Simulation 1: IMF intervention

Fig. VII.2

GDP % change
Restrict. policy
Expans. policy

Quarters

Fig. VII.3

Repression
Liberalisation
Unrest
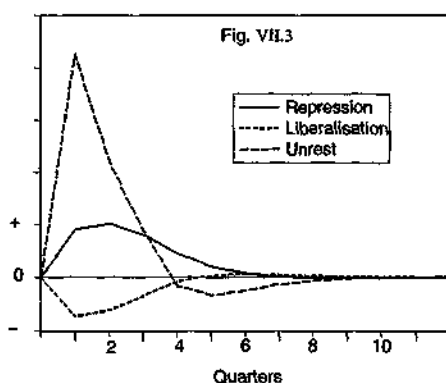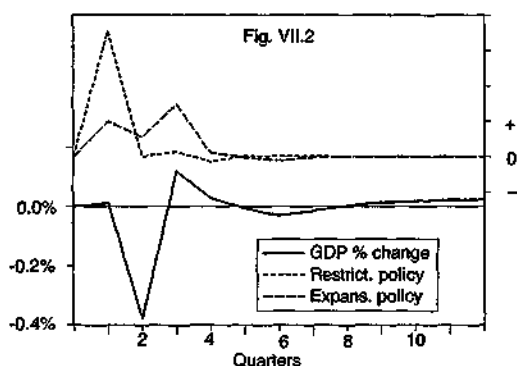
Quarters

As expected, IMF intervention involves restrictive (stabilisation) measures in the following quarter, which in turn induces a contraction of GDP (fig. VI.2). Unpopular measures spur social unrest, which the government addresses with additional repression (fig. VI.3). In parallel, the authorities seek the strategic support of key groups, e.g. granting them specific advantages or bribes (expansive measures). After two or three quarters –

once the IMF pressure has diminished – the authorities further relax economic policy (fig. VI.2), withdrawing part or all of the reform attempts. The rapid policy-shift pattern is partly grounded on the willingness to reduce popular discontent in the face of continued instability caused by the civil war. Yet in the Guatemalan case it also reflects a lack of political commitment to reforms, combined with strong opposition from the domestic political and economic elites[37]. Figure VI.2 also suggests that the impact of an IMF intervention on economic growth turns slightly positive after two years (considering only short-term adjustments on the demand side).

The results of the model estimation (see table VI.3) provide additional insights that help substantiate the simulation outputs. Restrictive economic measures are indeed an important factor of social unrest (statistically significant at the 0.95 level)[38]. The latter induces the government to abandon the reforms with a lag of two quarters, as confirmed by the strong correlation between unrest and expansionary economic measures with a lag of one semester. The estimation outputs further indicate that the government generally avoids taking unpopular economic measures in times of increased threat from the guerrilla, in order to minimise the risk of concomitant social unrest. The government is also inclined to adopt populist measures in parallel with political repression, with a view to mustering sufficient political support from key groups within the society while repressing others. In short, the Guatemalan politico-economic cycle suggests that political instability is associated with lax economic policy and is incompatible with sustained stabilisation programmes.

The second simulation aims at assessing the impact of political conditions associated with rewards or sanctions by external actors. Political conditionality vis-à-vis Guatemala for instance includes economic assistance from European countries in return for improvements in the

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[37] Powerful political and economic groups have successfully resisted several tax reform attempts and sectorial trade liberalisation (e.g. cement, poultry).

[38] Restrictive economic policy is actually much more significant in triggering unrest then an increase in consumption prices, inflation being statistically insignificant at conventional levels. This might seem contradictory to the extent that economic reforms often imply a price increase in basic commodities and public services as a result of subsidy cuts and increased taxation. But this actually confirms that the mere announcement of reforms (e.g. involving an increase in public transportation fares) triggered strong opposition which in turn led to the amendment or withdrawal of the contested measures before translating into substantial price increases. Moreover, inflation was able to be kept at the two-digit level and did not exceed 15 per cent over the whole period under review, except in 1985-87 and 1990-91.

peace process, or a lifting of the American arms-trade embargo conditional upon clarification and punishment of human rights violations. Figures VI.4 and VI.5 present the outputs in graphical form along the same logic as figures VI.2 and VI.3. What is striking is that the results go in the opposite direction when compared with the outcome of the first simulation, implying that economic and political conditionalities have opposite effects over short-term income fluctuations, economic policy decisions, political unrest, repression and liberalisation.

Figurea VI.4 and VI.5 - Simulation 2: political conditionality

Fig. VII 4

GDP % change
Restrict. policy
Expans. policy

Quarters

Fig. VII 5

Liberalisation
Unrest
Repression

Quarters
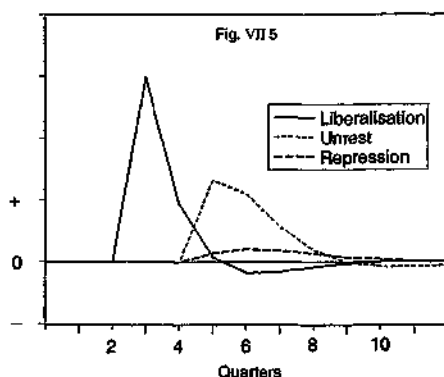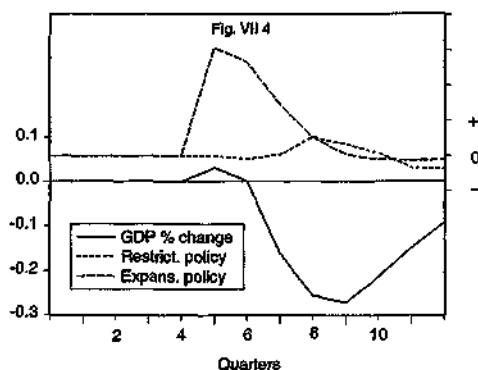
Figure VI.5 shows that political liberalisation intensifies in response to foreign pressures after one semester, which corresponds rather well with the time required to take legislative action following external pressure. Liberalisation tends to unleash civil unrest two periods later, accompanied by renewed repression. But the government cannot contain the ensuing political turmoil with repressive measures only, all the more if the external political pressure is maintained. To preserve its survival probability, the

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goverment introduces expansionary economic measures (fig. VI.4). As a result, GDP growth slightly accelerates before turning negative one semester later. Once the initial shock is partly absorbed, the government seeks to introduce corrective or restrictive economic measures.

Here too, the results of the model's estimation in table VI.3 provides further information to interpret the simulation outputs. The particular nature of state repression in Guatemala requires specific comments: the most significant factor explaining repression is its own lagged value. Conflict also appears to be significantly correlated with repression, but the value of the parameter is much smaller. The coefficient on unrest is statistically different from zero at the 37 per cent level only[39]. These results suggest that repression does not primarily respond to civil unrest and is partly self-generated by the government and the security forces. Recent investigations into the Guatemalan civil war echo this conclusion, in that over 90 per cent of the 200,000 deaths and disappearances related to the conflict are attributed to the army, the police and paramilitary forces (CEH, 1999; Ball et al., 1999). Even so, the estimated parameters for the political liberalisation function indicate that repression cannot go unabated for ever in the face of increasing costs. This is not only due to the threat of foreign sanctions. But it is also dictated by the reactions of economic agents to the extreme levels of political repression exerted by the Guatemalan authorities: the investment, consumption and import functions in table VI.3 all suggest that high repression levels have a negative impact on the economy.

VI.7   LIMITATIONS OF THE MODEL

The methodological approach presented in this chapter offers a promising avenue for future research on the crucial interactions between the political and economic spheres during sensitive postwar periods. Empirical studies will be considerably facilitated as the major practical difficulties are removed. First, advances in econometric software programmes allow for easier and user-friendlier resolution of simultaneous equation systems,

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[39] The correlation between repression and unrest (demonstrations, strikes and coup attempts) is statistically insignificant at usual levels. The same holds true when testing for lagged unrest.

comprising both quantitative and ordered qualitative dependent variables. Second, the collection and public release of systematic data on conflicts, human rights violations and political violence make it easier to construct reliable and comparable political indicators. Yet it is necessary to underscore some serious limitations associated with our politico-economic model in its present form. These derive from (i) the assumption of constant coefficients in the structural equations; (ii) the short-term bias mentioned above; and (iii) the merging of all the data related to distinct social groups into one single category that covers all of the domestic nonstate actors.

First, the assumption that equation coefficients remain constant throughout the study period is erroneous if the war fundamentally alters the socio-political and economic structures of a given country. The literature review precisely underlined that wars tend to shift the sectoral distribution of GDP in favour of activities which are less intensive in capital and transactions (see chapter II). To the extent that a conflict inflicts severe physical damage to production facilities and the infrastructure of a country, coefficients should be adjusted to account for the ensuing structural changes. In the Guatemalan case however, the assumption of constant coefficients can be considered as a valid one. For as shown in tables V.3 and V.4, the sectoral composition of Guatemala's GDP and employment structure did not change much between 1980 and 1996. It probably remained even more stable than if there had been no civil war: the share of agriculture did not change and still accounted for one fourth of GDP by 1996, whereas in neighbouring countries at peace during the same period, it tended to decline while the share of the secondary and tertiary sectors in GDP increased. In addition, the Guatemalan conflict did not cause substantial direct damage to the physical capital nor to the infrastructure. This is not surprising as governmental repression in rural areas accounted for the majority of political violence, while the main economic centres were not severely affected.

The second limitation of our model results from the fact that GDP – as specified in our model – only captures short-term fluctuations on the demand side. In order to be able to trace the long-term growth effects, the model should account for shifts on the supply side. Future research could build on the empirical literature on violence and growth to assess the relationship between conflict, peace-building and growth. But in our study, as argued above, the model's short-term bias is consistent with our initial

objective to assess the short-term interactions between the political sphere and the economy during the transition from war to peace[40]. In our model, external interventions and the guerrilla activity level are treated as exogenous variables, although one may argue that these variables can be treated as endogenous ones.

In our model, the different Guatemalan social groups are merged into a single category that includes all domestic actors except the government and the security forces. This third limitation is the result of the politico-economic model's specification. To estimate the behaviour of the different social groups and how these interact with each other, it would be necessary to add group-specific variables into the model. We would then face collinearity problems (many economic measures being popular or unpopular with several groups) as well as identification difficulties (Greene, 1993). That is why, in the model, the variables on expansionary and restrictive measures (Mp and Mn) are composites that reflect whether a policy is popular with a specific group, various socioeconomic groups or the civil society as a whole. To obtain these composites, we initially distinguished between three socioeconomic categories: capitalists, urban workers and rural workers. We then estimated how far economic measures are popular, unpopular or neutral with each group, and aggregated the results in a single composite (see section VI.3.2 above).

By doing so, we lost interesting data that would allow for improved political and distributional analysis. This is where the social accounting framework presented in chapter III offers a useful method to complement the macroeconometric model above with distributional analysis. Both approaches thus complement each other, as in our Guatemalan case study.

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[40] This objective was based on the assumption that short-term reactions have the potential to derail a fragile peace process and should therefore be our primary focus of attention.

Annexe VI.1: List of the model's equations and variables

Behavioural Equations in the Model

$$Mn_t = \rho_0 + \rho_1 IMF_t + \rho_2 \log RM_{t-2} + \rho_3 \left(\frac{e_{t-1} P^*_{t-1} D_{t-1}}{P_{t-1} Y_{t-1}} - \frac{e_{t-2} P^*_{t-2} D_{t-2}}{P_{t-2} Y_{t-2}} \right) + \rho_4 \frac{CP_{t-1}}{CP_{t-2}} + \rho_5 Gu_t$$

(1)

$$Mp_t = \phi_0 + \phi_1 \log \frac{Y_{t-1}}{Y_{t-2}} + \phi_2 Un_t + \phi_3 Rp + \phi_4 Mn_{t-2}$$

(2)

$$\log G_t = \Phi_0 + \Phi_1 \log Y_t + \Phi_2 \log \frac{M2_t}{P_t} + \Phi_3 \log \frac{e_{t-2} P^*_{t-2} D_{t-2}}{P_{t-2} Y_{t-2}}$$

(3)

$$Rp_t = \chi_0 + \chi_1 Rp_{t-1} + \chi_2 Un_t + \chi_3 Co_t$$

(4)

$$Lb_t = \omega_0 + \omega_1 Lb_{t-1} + \omega_2 Un_t + \omega_1 Co_t + \omega_4 Cond_{t-2}$$

(5)

$$\log \frac{C_t}{N_t} = \alpha_0 + \log \alpha_1 \frac{C_{t-1}}{N_{t-1}} + \alpha_2 \log \frac{Y_t}{N_t} + \alpha_3 Mp_t + \alpha_4 Rp_t + \alpha_5 Co_{t-1}$$

(7)

$$\log K_t = \beta_0 + \beta_1 \log K_{t-1} + \beta_2 \log Y_t + \beta_3 Mn_{t-1} + \beta_4 Mp_{t-1} +$$
$$\beta_5 \log \frac{e_{t-1} P^*_{t-1} D_{t-1}}{P_{t-1} Y_{t-1}} + \beta_6 \log \frac{P_{t-1}}{P_{t-2}} + \beta_7 Rp_t + \beta_8 Co_{t-1}$$

(8''')

$$\log X_t = \gamma_0 + \gamma_1 \log X_{t-1} + \gamma_2 \log Y^*_{t-1} + \gamma_3 \frac{e_t P^*_t}{P_t}$$

(9)

$$\log M_t = \varphi_0 + \varphi_1 \log M_{t-1} + \varphi_2 \log \frac{P_{t-1} Y_{t-1}}{e_{t-1} P^*_{t-1}} + \varphi_3 Mp_{t-1} + \varphi_4 Mn_{t-1} + \varphi_5 Co_{t-1} + \varphi_6 Rp_t$$

(10)

$$\log \frac{P_t}{P_{t-1}} = +\tau_0 + \tau_1 (\log Y_{t-2} - \tau_2 \log YP_{t-2}) + \tau_3 \log \frac{P_{t-1}}{P_{t-2}}$$

(12)

$$Un_t = \lambda_0 + \lambda_1 Mn_t + \lambda_2 \log \frac{CP_t}{CP_{t-1}} + \lambda_3 Rp_{t-1} + \lambda_4 Lb_{t-2} + \lambda_5 Un_{t-1}$$

(14)

Annexe VI.1 (continued): Accounting identities in the model

$$Y_t = C_t + G_t + I_t + X_t - \frac{e_t P_t^* M_t}{P_t} \tag{6}$$

$$K_t = I_t + (1 - \delta) K_{t-1} \tag{8'}$$

$$R_t = R_{t-1} + \frac{P_t X_t}{e_t P_t^*} - M_t + D_t - (1 + i^*) D_{t-1} + NT_t \tag{11}$$

$$\log CP_t = \Omega_t \log P_t + (1 - \Omega_t) \log e_t P_t^* \quad \text{and} \quad \Omega_t = \frac{C_t + I_t + G_t}{C_t + I_t + G_t + e_t P_t^* M_t / P_t} \tag{13}$$

Endogenous Variables		**Exogenous Variables**	
Quantitative		*Quantitative*	
G	Public consumption	D	Real stock of foreign debt
C	Private consumption	e	Nominal exchange rate
I	Gross domestic investment	M2	Monetary aggregate M2
X	Real exports (goods and services)	P*	US GDP deflator
M	Real imports (goods and services)	N	Population
P	GDP deflator	Y*	US real GDP
CP	Consumption prices	i*	Av. interest rate on foreign
Y	Real GDP		debt
R	Real international reserves		
NT	Other net transfers from abroad		
K	Capital stock		
Qualitative		*Qualitative*	
Mn	Restrictive economic measures	IMF	IMF interventions
Mp	Expansive economic measures	Gu	Guerrilla activity
Rp	Political repression	Co	Conflict intensity
Lb	Political liberalisation	Cond	Political conditionality
Un	Political unrest		

Annexe VI.2: Estimation Method for tha quarterly national accounts

This estimation method is reproduced from Chow and Lin (1971). The estimator can be derived as follows. During the sample period of 4 T quarters, the relation is

$$z = X\beta + u \qquad (15)$$

where z is a quarterly vector of $4T$ x 1, X a matrix of quarterly indicators $4T$ x k, and u is a random vector with mean 0 and covariance matrix $V = E(uu')$. In the case of flow variables, we have:

$$C = c'\otimes I_t \qquad (16)$$

where C is a conversion matrix from quarterly to yearly data, $c = (1,1,1,1)'$, $\otimes$ the Kronecker Product and I the T x T identity matrix. Then,

$$y = Cz = CX\beta + Cu = x^*\beta + u^* \qquad (17)$$

Here, y represents the vector of annual reference values T x 1, * signals the annual component of the equation. For u^*, we have $V^* = E(u^* u^{*'}) = CVC$. Chow and Lin (1971) construct a BLUE to estimate a vector z of quarterly data which satisfies equation (15) and the aggregation constraint $z = y$:

$$\hat{z} = X\hat{\beta} + (VC'V^{*-1})\hat{u}^* \qquad (18)$$

where

$$\hat{\beta} = (X^{*'}V^{*-1}X^*)^{-1}X^{*'}V^{*-1}y \qquad (19)$$

is the generalised least squares estimate of the regression coefficients for the aggregated model and

$$\hat{u}^* = y - X^*\hat{\beta} \qquad (20)$$

represents the vector of residuals in the aggregated regression.

The first part of equation (18) ($X\hat{\beta}$) applies the estimated regression coefficient to the disaggregated observations of the related variables (in the matrix X) in order to estimate a preliminary disaggregated series. The

second part of equation (18) $(VC'V^{*-1})u^*$ can be considered as an additional component that uses a weighted combination of the aggregated regression residuals in order to satisfy the aggregation constraint (e.g. that the sum of the four quarters and the yearly figures are the same in the case of flow variables). Practically, we make a first estimation on the basis of first-order differences and then make a regression on the level using Chow-Lin's BLUE. The aggregation constraint is thus respected and we obtain:

$$C\hat{z} = Cx\hat{\beta} + CVC'V^{*-1} \hat{u}^* = x * \hat{\beta} + \hat{u}^* = y \tag{21}$$

The application of this estimator to stock variables requires a transformation of the conversion matrix C:

$$C = c'\otimes\frac{1}{4}I_t. \tag{22}$$

The model presupposes the estimation of a covariance matrix $C=E(uu')$ which requires lengthy and complex calculations. The comprehensive estimation of the covariance matrix would not bring substantial improvements to the model output. For our objective is not to extrapolate values over several years, but to estimate quarterly values for known yearly reference variables. We thus set an arbitrary first covariance value for the residuals of 0.5, which roughly corresponds to an average value found in empirical data. Our hypothesis on the distribution of errors does not significantly alter the results: we obtain similar values with different hypotheses such as a strong or a weak correlation of residuals (0.8 and 0.2 respectively).

VII. CONCLUSION

A critical survey of the economic literature on conflicts and reconstruction shows that dealing with today's war-torn economies and rebuilding postconflict societies represents a complex and somewhat novel field for scholars and practitioners alike. Reconstruction encompasses many intertwined variables that coexist and simultaneously interact with the consolidation of peace: humanitarian, economic, political, cultural, religious, environmental factors and so on. In this dissertation, we started from the assumption that political stability cannot be relegated to a lower priority economic efficiency, in so far as rebuilding efforts are in vain if the conflict rekindles.

The costs of contemporary conflicts are enormous -- not only in terms of human suffering and destruction of physical and social capital, but also when considering opportunity costs, making civil war a major cause of underdevelopment. Yet, the civil war factor has been widely neglected or treated as an exogenous event not amenable to economic analysis. There has been a tendency to conduct economic analysis on conflict-ridden countries only once some sort of normality has returned. This may be due to severe methodological and statistical limitations, but has been further compounded by the traditional boundaries that delineate the realm of economics from that of other social sciences.

After surveying relevant literature, we concluded that the interactions between economic reform and political stability are crucial during the fragile transition from war to peace. This doctoral research thus focused on how to better integrate the political dimension into economic analysis and policy advice to conflict-ridden countries. To this end, we explored and tested two main avenues: (i) the social accounting framework and (ii) the modelling of politico-economic interactions.

We resorted to the social accounting framework because SAMs offer a tool to reconcile the sparse and inconsistent data that is often available for war-torn economies. SAM-based models can further serve to assess the distributional impact of policy shocks and analyse how policy decisions affect various socioeconomic groups. We constructed a simple social accounting matrix for Guatemala, taking the beginning of the peace

process as the base year (1986). We used the SAM to analyse the economic structure of the country, including the sectoral contribution to total supply and demand, and the secondary income distribution. We then partitioned the SAM into endogenous and exogenous accounts and obtained the matrix of accounting multipliers. We decomposed this matrix following the method initially presented by Pyatt and Round (1979) and further developed by Defourny and Thorbecke (1984) to calculate the transfer, open-loop and close-loop effects resulting from exogenous injections.

We then ran simulations of various exogenous shocks in the tax accounts, and assessed their distributional impact. Tax reform is particularly relevant in the case of postconflict Guatemala, in so far as it was singled out as the major economic policy challenge, and the government committed itself in the peace accords to addressing this issue. The four simulations related to an increase in government expenditure as well as to budget-neutral shifts between direct and indirect taxes. Even if the limitations inherent to all SAM-based models call for caution in interpreting the results, the simulation outputs help explain why some measures were successfully introduced, while attempts to implement reforms advocated by the international financial institutions repeatedly failed:

- The government succeeded in gradually reducing customs tariffs and increasing the value-added tax rate. The simulations showed that these measures did not harm any household group in a dramatic manner and, consequently, did not spur major opposition from powerful groups within the Guatemalan society.

- But all attempts to introduce a more progressive tax system failed, whether a new income tax, or efforts to reduce tax evasion and increase the level of existing direct taxes. The simulations help explain why the ruling oligarchy and the economic elite, who rightly felt that they would be bound to lose, expressed outright opposition. The successive governments were unable or unwilling to go against these powerful interests and did not try to muster sufficient popular support for these reforms, which were also advocated by the international financial institutions.

We then developed a specific methodological approach for the analysis of war-torn economies that comprises a basic conceptual framework, microeconomic considerations and a macroeconometric model to capture

crucial politico-economic interactions. The politico-economic framework is based on a model of demand for and supply of government support developed by Frey and Eichenberger (1992). We elaborated on the contributions brought by Haggard, Lafay and Morrisson (1995) to highlight that the politically optimal policy mix from a government's standpoint radically differs from the economic optimum advocated by the international financial institutions (IFIs). We integrated civil unrest and government repression in the model and assessed the impact of political conditionality exerted by major foreign partners with respect to democratisation, peace-building and human rights. We showed how political or peace-related conditionality contradicts with the traditional economic conditions set by the IFIs and how foreign aid may partly help postconflict countries cope with the diverging requirements imposed by the international community.

We constructed a macroeconometric model consisting of both quantitative and ordered qualitative dependent variables, with a view to capturing the relationships between the economy, the government, the social groups and key external actors during the transition from civil war to peace. Taking Guatemala as a case study, we provided a historico-analytical overview of the Guatemalan economy and polity over the past twenty years. We then had to build quarterly national accounts for Guatemala based on annual figures. We further elaborated a political database which included the main events related to the conflict and civil unrest, as well as policy decisions and conditionality in the political and economic spheres. Once the model was estimated, we assessed the specific contribution of the political variables: the results confirmed that our politico-economic model has a stronger descriptive capacity than more traditional models relying strictly on quantitative, economic data, thus supporting our argument to duly include political variables in economic analysis on war-torn countries.

Our results suggest that the methodological approach presented in this dissertation is a promising route for further research on war-torn countries, all the more that the major technical difficulties are being removed:

• the computational intricacies associated with the resolution of models combining both quantitative and ordered qualitative dependent variables are being efficiently addressed by ongoing progress in econometric software packages;

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- the construction of conflict-related data sets shall be greatly facilitated by a more systematic monitoring and reporting of political violence and human rights violations worldwide (e.g. Commission for Historical Clarification in Guatemala).

The macroeconometric model served to simulate the influence of external actors over war-torn countries. The outputs highlighted on the one hand stark contradictions between economic and peace conditionality, or between democratisation and political liberalisation one the one hand, and the introduction of drastic economic reforms to stabilise the economy on the other. The results clearly showed that peace or political conditionality induces the government to adopt lax economic policy in order to muster sufficient political support to stay in power against the background of democratisation. But economic conditionality often means political turmoil and civil unrest, which in turn spurs increased repression from the government. In short, the side effects of traditional economic conditions associated with IMF stand-by arrangements and those associated with political or peace conditionality go in the opposite direction. This calls for a more coherent approach from the international community. External actors can play a pivotal role in smoothing the political impact of stabilisation measures during the fragile transition from war to peace. Foreign aid is required in particular to finance adequate compensatory measures and safety nets. As for domestic actors, extensive policy dialogue and participatory processes are necessary to lessen the risk of violent confrontations between diverging interests, even if this causes some delay in the reform timetable.

As far as we know, this study represents the first attempt to apply econometric modelling and testing in the framework of a specific case study on a war-torn country. The macroeconometric framework differs from traditional models by integrating political variables. It also differs from the standard politico-economic models in public choice in that it accounts for the specific institutional settings of developing countries, in particular the autocratic nature of political regimes and the violent means through which popular discontent is channelled. Another novelty has been to introduce several variables that reflect the subjective perception of politico-economic events rather than purely objective or quantitative data, consistent with recent conclusions drawn by psychologists and economists on the interactions between politics and growth.

The originality of this doctoral research lies in the inclusion of political and conflict-related variables in macroeconometric modelling, as well as in the interpretation of simulation results of SAM-based and politico-economic models. The relations between public policy choices and the economy are assessed via the whole politico-economic cycle, including the armed conflict, repression and social unrest. Another novelty has been to focus on the direct and indirect effects of economic and political conditionality in the case of war-torn countries to highlight contradictions between the economic and political agendas of external actors. For the simulation outputs showed that the simultaneous implementation of political and economic reforms required in the aftermath of a protracted conflict tends to undermine the political and social environment required to restore confidence among economic agents and mend relations between former rival groups.

The shortcomings of the two methodological approaches developed in this doctoral research have been clearly singled out. The main limitation derives from the assumption of constant coefficients in the SAM framework, as well as in the behavioural equations of the politico-economic model. This limits the applicability of both SAM-based models and the macroeconometric model to contexts where the war did not radically alter the sociopolitical and economic structures, thus excluding many countries ravaged by an armed conflict. Yet the hypothesis of constant coefficients holds for countries such as Guatemala, in which the war did not destroy the physical capital nor the infrastructure, but slowed down or even halted the pace of modernisation.

The remaining comments situate our results within the current debates among scholars and practitioners. The discussions on *economic reform versus peace-building* are becoming less controversial. Few structural adjustment critics would deny the desirability of macroeconomic stability and reasonable fiscal and monetary policies, even in the aftermath of civil strife. On the other hand, international economic institutions, and the World Bank in particular, have come to recognise the need to tailor appropriate programmes for each war-torn country so that economic reforms do not frustrate, but enhance peace efforts. There has indeed been some progress when comparing rebuilding strategies in El Salvador in 1992 and Guatemala in 1997. The IMF Director General Camdessus publicly declared on a visit to Guatemala in May 1997 that the principal requirement attached to financial assistance was the timely implementation of the Peace Accords signed in December 1996, implying close parallelism

between peace and economic conditionality. But one may still question to what extent large institutions with different cultures and mandates are committed and just how able they are to translate new guidelines and official statements into operational reality in postconflict countries.

Discussions on *peace and economic conditionality* are ongoing. Effective conditionality obviously requires concerted efforts by the international community and presupposes some consensus on the objectives of – and criteria for – conditions attached to aid, together with improved transparency between donors and recipients. Indeed, the contradictions highlighted in this doctoral research call for more coherence in the overall approach of bilateral and multilateral organisations vis-à-vis war-torn societies. There is a pressing need to reconcile political and economic conditionality as much as possible, and to devise well-targeted assistance programmes that include compensatory measures as appropriate. Improving coherence in donor countries is not a simple task, as it involves a whole range of ministries and organisations with different mandates and prerogatives. On the other hand, participation of domestic constituencies in policy dialogue is essential to the success of both economic reform and peace-building processes. This directly relates to the debate on the merits and disadvantages of technocratic insulation for optimal economic policy design and implementation. While technocratic insulation has been praised in the case of the East-Asian economic "miracles"[41], it may revive tensions and be counterproductive in the case of war-torn countries. For it contradicts the main objectives of the transition from war to sustainable peace, i.e. (i) the establishment of institutional mechanisms to settle disputes; (ii) the creation of checks and balances on the exercise of power; and (iii) the promotion of a culture of dialogue between former warring parties.

Coming to *external assistance*, a series of lessons and best practices have recently been produced. One of the most important findings relates to the necessity of adapting aid and its delivery to local circumstances. Domestic actors should be involved in the design and distribution of externally-funded assistance at all stages, with the objective of strengthening local capacities and self-reliance. For the long-term success of reconstruction programmes relies first and foremost on the capacity of domestic actors to be reconciled. One of the key components is the restoration of the

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[41] World Bank, 1993.

institutional mechanisms and human potential for peaceful management of conflict and competition. A first step should be to involve domestic actors in research on – and design of – locally accepted solutions. It is true that doing so is a time-consuming exercise. But we contend that it should nonetheless be promoted, even at the expense of delays in the reconstruction timetable.

Turning to income inequality and distributional issues, the traditional argument is that reducing income and asset inequality contributes to lessening tensions and strengthening political stability. However, we argue that postconflict situations often require a more cautious approach. In specific circumstances, redistribution in favour of the poorest may provoke a violent backlash in the aftermath of a civil war: former combatants, impoverished middle-class representatives and former economic elites are often politically more vocal than the poor. This has been the case in Guatemala, as shown in our case study based on the SAM framework. If the former elites feel threatened by redistribution policies, they may defend their interests with unexpected violence[42]. A fundamental challenge for policy makers is thus how to accommodate pressing demands for more equity while avoiding at the same time a resurgence of violence. To this end, distributional issues should not be confined to income gaps or differences in wealth only. In postconflictual situations, inequality should be assessed in the wider context of individual and collective power, removal of specific privileges, decentralisation, access to public services, etc.

A last word on reconstruction and globalisation. Postwar countries face the immense task of (re)integrating into the global world economy. This is more arduous now than it was decades ago: the process of world-wide liberalisation and technological progress has accelerated and regional integration has intensified, outsiders lagging ever more behind. While many war-torn societies have fallen prey to the internationalisation of criminal and speculative activities, they are in a much more difficult position to seize the potential benefits of globalisation. Peace being settled, they have to strive to become gradually able to compete on regional and world markets as well as to promote their interests in economic and trading fora. Here again, a coherent approach of the international community is

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[42] In cases where the economic elites think in a long-term perspective, they may agree to allow some fiscal redistribution to protect their own asset holdings against renewed violence in the medium to long term.

required to help war-torn countries join the world economy while simultaneously laying the ground for a firm and lasting peace.

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