The impact of increases in public expenditure on poverty in Rwanda

Final Report

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Background to the PSIA Studies

Poverty and Social Impact Analysis (PSIA) is an important feature of the new approach to supporting poverty reduction in developing countries. PSIA is defined as the analysis of intended and unintended consequences of policy interventions on the well-being or welfare of different groups, with a special focus on the vulnerable and poor. Well-being or welfare includes the income and non-income dimensions of poverty.¹

The overarching objective of PSIA is to promote evidence-based policy choices, by explicitly including poverty and social impacts in the analysis of policy reforms, and to build country ownership of policies by informing a public debate on the trade-offs between policy choices.

Analysing poverty and social impact is not new, but it has yet to be routinely applied to macroeconomic and structural policy measures. In August 2000, the IMF and World Bank agreed to consider the poverty and social impact of major reforms in their lending programmes to developing countries.² Increasingly, developing country governments are initiating plans to undertake PSIA of key policy measures as part of the process of refining their Poverty Reduction Strategies.

In 2001, the UK Department for International Development (DFID) undertook to support demonstration studies in six countries, in response to requests from governments and other national stakeholders for ex ante analysis of the likely poverty and social impact of particular policies or programmes. Six DFID-supported PSIA pilot studies were carried out in Indonesia, Honduras, Armenia, Uganda, Rwanda, and Mozambique.

The World Bank also undertook to pilot PSIA in six countries. In October 2002, findings from the DFID and World Bank supported pilot studies were brought together at a workshop in Washington DC, hosted by World Bank, IMF and DFID. Key findings of the workshop include that it is feasible to undertake PSIA using existing data and knowledge in country, and that for PSIA to be effective in informing policy decisions, it needs to be country-owned and embedded in the national PRS process.³

The following report has been produced by independent researchers, and has been independently peer reviewed. The analysis and views contained in the study are the authors’ alone.


Disclaimer

This report is the work of independent researchers. It was commissioned by the Government of Rwanda in collaboration with the Department for International Development (DFID). The report does not necessarily represent either the views of the Government of Rwanda or of the Department for International Development.

In its present form, the responsibility for any of the opinions expressed in this report rests with the authors alone. Comments may be directed to:

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<tr>
<td>BoP</td>
<td>Balance of Payments</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Indicator</td>
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<tr>
<td>CWIQ</td>
<td>Core Welfare Indicators Questionnaire</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development (UK)</td>
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<tr>
<td>EICV</td>
<td>Enquete Integrale sur les Conditions de Vie des Menages</td>
</tr>
<tr>
<td>ESAF</td>
<td>Extended Structural Adjustment Facility</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>HIPC</td>
<td>Heavily Indebted Poor Country</td>
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<tr>
<td>IDA</td>
<td>International Development Association</td>
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<td>IFI</td>
<td>International Funding Institution</td>
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<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>I-PRSP</td>
<td>Interim Poverty Reduction Strategy Paper</td>
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<tr>
<td>MEFP</td>
<td>Memorandum of Economic and Financial Policies</td>
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<tr>
<td>MINACOM</td>
<td>Ministry of Commerce, Industry and Tourism</td>
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<tr>
<td>MINAGRI</td>
<td>Ministry of Agriculture</td>
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<tr>
<td>MINALOC</td>
<td>Ministry of Local Government</td>
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<tr>
<td>MINEDUC</td>
<td>Ministry of Education</td>
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<tr>
<td>MINCECOFIN</td>
<td>Ministry of Finance and Economic Development</td>
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<tr>
<td>MINIRENA</td>
<td>Ministry of Energy, Water and Natural Resources</td>
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<td>MINISANTE</td>
<td>Ministry of Health</td>
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<tr>
<td>MINITERRE</td>
<td>Ministry of Lands, Human Resettlement, and Environmental Protection</td>
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<tr>
<td>MINITRACO</td>
<td>Ministry of Public Works, Transport and Communication</td>
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<tr>
<td>MSU</td>
<td>Management Support Unit</td>
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<tr>
<td>MTEF</td>
<td>Medium Term Expenditure Framework</td>
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<tr>
<td>OPEC</td>
<td>Organisation of the Petroleum Exporting Countries</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<tr>
<td>NPA</td>
<td>National Participatory Assessment</td>
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<tr>
<td>NPV</td>
<td>Net Present Value</td>
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<tr>
<td>PPA</td>
<td>Participatory Poverty Assessment</td>
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<td>PRGF</td>
<td>Poverty Reduction and Growth Facility</td>
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<td>PRS</td>
<td>Poverty Reduction Strategy</td>
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<td>PRSC</td>
<td>Poverty Reduction Support Credit (World Bank)</td>
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<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
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<td>PSIA</td>
<td>Poverty and Social Impact Analysis</td>
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<tr>
<td>PWP</td>
<td>Public Works Programme</td>
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<tr>
<td>RDRC</td>
<td>Rwanda Demobilisation and Reintegration Commission</td>
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<tr>
<td>REER</td>
<td>Real Effective Exchange Rate</td>
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<td>SAL</td>
<td>Structural Adjustment Loan (World Bank)</td>
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Summary

INTRODUCTION

Poverty and Social Impact Analysis

Poverty and Social Impact Analysis (PSIA) is an important feature of the new approach to supporting poverty reduction in developing countries, characterised by the development of Poverty Reduction Strategies. PSIA is defined as the analysis of intended and unintended consequences of policy interventions on the well-being or welfare of different groups, with a special focus on the vulnerable and poor. Well-being or welfare includes the income and non-income dimensions of poverty.

The overarching objective of PSIA is to promote evidence-based policy choices, by explicitly including poverty and social impacts in the analysis of policy reforms, and to build country ownership of policies by informing a public debate on the trade-offs between policy choices.

Analysing poverty and social impacts is not new, but it has yet to be routinely applied to macroeconomic and structural policy measures. In August 2000, the IMF and World Bank agreed to consider the poverty and social impact of major reforms in their lending programmes to poor countries. In 2001, DFID in collaboration with the World Bank undertook to support demonstration studies in six countries where governments and other national stakeholders expressed clear demand for PSIA (including Indonesia, Honduras, Armenia, Uganda, Rwanda, and Mozambique). In October 2002, findings from the DFID and World Bank supported pilot studies were brought together at a workshop in Washington DC. Key findings of the workshop include that it is feasible to undertake PSIA using existing data and knowledge in country, and that for PSIA to be effective in informing policy decisions, it needs to be country-owned and embedded in the national PRS process.

The Origins of the Rwandan PSIA

Interest within Rwanda. There was considerable interest in Rwanda in the possibility of using PSIA to improve debate about key policy issues.

Poverty Reduction Strategy. Rwanda presented a draft PRSP in November 2001, containing expenditure scenarios and a macroeconomic framework. Growth projections are founded on agricultural recovery, responding to supply side improvement, with increased use of inputs. This is complemented by an export diversification strategy. Recognising that this will take time, the PRSP proposes a short-term environmentally sensitive public works programme to provide input of resources to the rural sector.

This broad strategy is translated into sectoral strategies, and will be implemented in the context of the ongoing decentralisation process. The sector strategies are reflected in expenditure scenarios which are based on a substantial costing exercise. A participatory

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5 The World Bank undertook to pilot PSIA in an additional six countries.
process gave priority to agriculture and health. Programme prioritisation used the following criteria:

- poverty reduction
- activities with no private sector interest
- community self-selection
- well-planned project with low spending
- sectoral planning activities
- projects to reduce future recurrent costs
- affordably replicable projects
- labour intensive projects
- projects to create infrastructure for development
- activities for disadvantaged groups

The PRSP defines three expenditure scenarios:

- the lowest follows the existing Medium Term Expenditure Framework (MTEF);
- the second adds about US$100m for labour intensive public works, road maintenance and rehabilitation, emergency roofing and water harvesting kits, and additional support for health education and agricultural services;
- the third adds substantial amounts for road construction and tertiary education and is intended as an indication of ideal expenditure levels.

The higher expenditure scenarios reflect the priority on agriculture and health to some extent, but roads, power and water receive high spending and increases in health spending are more modest.

The PRSP assumes that the higher spending scenarios will be funded mainly by an increase in external assistance, including grants and concessional lending. Past experience suggests that it may be difficult to increase actual donor spending by this amount, although some of the programmes are already funded through off-budget donor programmes. In practice, even if the expenditure was achieved, real spending per capita would still not be much greater than it was a decade ago.

Choice of Topic. The PRGF and MTEF incorporated a constrained macroeconomic framework. Those supporting this constraint, including the IMF, are mainly concerned about the possibility of boosting expenditure obligations to levels which could only be sustained by inflationary financing, if donor funding was reduced. This is a particular concern in Rwanda, which has had unpredictable aid flows in the past and has weak domestic revenue collection. Other concerns included: the risk of increased indebtedness, if some donor funding came from loans, and the disincentive effect debt has on private incentive; the Dutch disease effects of exchange rate appreciation associated with a higher supply of foreign currency, and the effect of this on trade competitiveness; the weak implementation capacity of government; and the risks of fungibility into non-priority expenditure.

However, there has been no rigorous examination of the impact of higher public expenditure levels. There are several reasons why the optimum level of donor support for public expenditures might be higher in Rwanda than in other countries.
### Summary

- Recent comparative international work suggests that international support should be targeted on such countries, such as Rwanda, which are very poor and have sound macroeconomic management.
- The underlying economic structure is unusual in that Rwanda is densely populated and highly dependent on agriculture. This means that there are major environmental problems and that growth will be dependent on agricultural intensification which requires relatively high public support.
- The legacy of genocide requires spending on housing, legal reform, compensation, human capital, livestock and social capital. These are in addition to a programme of specific exceptional and temporary expenditure which is included in the PRGF (i.e., gacaca, demobilisation, survivors’ fund, prisons, governance commissions and three tertiary institutions).

Negotiations over the level of the 2002 budget, which took place in the context of PRGF preparation, were intensive and resulted in some downward revision in expenditure. However, the PRGF accepted that some additional programmes could be allowed, if grant funding were available which would have no impact on the macroeconomic balance.

### POVERTY IN RWANDA

From the 1980s onwards, Rwanda suffered from high rates of population growth, declining agricultural productivity, environmental degradation and falling per capita GDP.

In 1994, Rwanda experienced a genocide in which more than 10% of the country’s population are believed to have died. Reconstruction has been in progress ever since, and a great deal has been achieved. However, the country still has many burdens associated with the genocide. GDP per capita has recovered to 1993 levels (though not yet to 1983 levels), but inequality (and hence poverty) are higher. The poverty headcount was 48% in 1985, reached 80% immediately after the genocide and is now at 68%. Similarly, child mortality has risen from 150 per thousand before the genocide to 196.

Surveys suggest that poverty is largely rural, to a greater extent than most African countries. There is widespread rural unemployment, despite labour shortages, because households are unable to pay wages. Few households can afford to intensify inputs. Most households lost most of their assets (notably livestock) in the genocide, with consequent reductions in manuring and soil fertility. While tea volumes have recovered, coffee volumes have not. The highly rural nature of poverty suggests that solutions to poverty need to cover the whole range of rural livelihood issues.

### A PSIA ON THE LEVEL OF PUBLIC EXPENDITURE

#### Methodology

Existing economic theory is reviewed and adapted to the case of an aid recipient country.

The PSIA applies a simulation approach, establishing a framework of consistent macroeconomic projections (similar to the standard RMSM format) and exploring the impact of the expenditure programmes defined in the PRSP on subsequent public spending.
Evidence for the key macroeconomic relationships is gained partly from econometric analysis of Rwandan data. Some additional evidence is mobilised from comparative international work.

Analysis of the benefits generated by public spending is problematic, but the study reviews the evidence available for each of the main poverty-reducing PRSP programmes.

The study uses the simulation framework to identify the principles for optimal policy stance and for macroeconomic programme design.

**Findings**

Economic theory proposes that the optimal level of expenditure depends on the relationship between growth, interest rates and returns to expenditure. In general, governments should pursue all expenditure programmes which generate higher net returns (taking account of negative macroeconomic effects) than the interest rates charged on the source of finance. There are a number of difficulties in applying this in practice:

- macroeconomic effects, such as the risks of donor withdrawal, can be difficult to assess
- the returns to some types of expenditure are difficult to assess, which leads some models to assume that they equate to interest rates

Even if the above economic theory could be applied, there are some reasons why results might not be optimum:

- it is difficult to incorporate the value of environmental and political sustainability
- it does not explicitly address the detail of poverty processes and the possibility that some types of expenditure will address these processes better than others
- the impact on vulnerable groups (eg women and the elderly) is only beginning to be included
- there is no consideration of income distribution

**Inflation** can be damaging at levels of over 10%, largely based on international reviews. The relationship between expansionary public financing and inflation is not clear from econometric analysis, but international evidence suggests it will be strong.

**Financing.** Most macroeconomic analysis (including that used in HIPC) considers that debt sustainability requires stable debt:GDP ratios (or debt:export ratios). This is a safe option, given the uncertainty about public finance management and other debt effects. But it can be shown that, if economic growth is higher than interest rates, it will be sustainable to have some increase in the debt:GDP ratio. This conclusion suggests that the HIPC indicators may be more restrictive than necessary.

More complex decisions may be needed if alternative sources of financing are available at different periods. In particular, it may be optimal to try to save some revenue for future periods if it is felt that returns will be higher in future (and provided that donors do not impose a use-it-or-lose-it constraint or that other receipts will not be suppressed).
**Mid-Term Expenditure Effects.** The demonstration PSIA considers 36 PRSP programmes and assesses whether their impact on subsequent (ie medium-term) spending will be positive, neutral or negative.

The analysis suggests that, for the first year of the second PRSP scenario, 42% of spending has a positive impact on subsequent spending, 51% is neutral and 7% is negative. The net impact on future spending increases through the period. The analysis is heavily influenced by the assumption that rehabilitation work increases subsequent spending, because operation and maintenance obligations go up.

There was insufficient time to estimate the level of increased spending.

The study concludes that, for the foreseeable future, there is little reason to expect a reduction in future aid receipts, provided that the internal and external security situation continues to improve. It is argued that government's concern to reduce aid dependency is motivated more by a concern to avoid disruption and lack of coordination than by a concern to have less aid receipts.

**Macroeconomic Effects.** Considering the possible macroeconomic effects of increased public expenditure, the study recognises the risk that increasing public expenditure could lead to an increase in the current balance of payments (BoP) deficit, because domestic demand boosts the relative price of non-tradables and there is increased supply of foreign exchange. Econometric analysis of the relationships between prices, the real exchange rate and other indicators, does not produce firm conclusions, as it is impossible to isolate the various effects. However, the study suggests out that an increased current BoP deficit could be corrected if the exchange rate is allowed to fall, thus correcting the initial tendency to appreciate.

There is some evidence that the effects of exchange rate appreciation on exports would not be severe, but that exports are sensitive to public support.

Comparative international work does provide some evidence that government spending and aid tends to lead to a real appreciation of the exchange rate. But comparable analysis also suggests that the longer term relationships are unclear and depend on the productivity of the public expenditure.

The study recognises that increased public spending is likely to lead to increased prices paid by government to suppliers and that little of this is likely to be of direct benefit to the poor. This issue has not received much international attention and it is difficult to assess how important it might be.

The link between public expenditure and employment is well established, from Keynes onwards. It is expected that this would be important if the PRSP spending programmes were pursued. Indeed, increasing employment is an important secondary objective of the public works programmes.

The study considers the possibility that Rwanda will be able to increase revenue to fund a higher proportion of PRSP expenditure. Past data suggests that economic growth will deliver significantly higher revenues, but the PSIA argues that increasing tax rates and collection efficiency will offer less scope.
Direct Public Expenditure Benefits. Much aid is effectively fungible, but this is not a major problem in Rwanda, where the government has shown strong commitment to the PRSP priorities. However, the benefits of public expenditure are strongly influenced by transparency and accountability.

International comparative studies suggest that aid does tend to increase growth and reduce poverty, provided that policies are sound. However these studies consider the net effect of aid on growth and poverty, and it is therefore difficult to isolate the direct effects from the indirect macroeconomic processes.

The analysis of direct benefits is problematic, partly because many of the PRSP programmes are new. The following conclusions can be drawn with reference to programmes covering 58% of the extra expenditure in the third PRSP scenario.  

- Intensifying small-scale agriculture and livestock (including extension, credit, and support to marketing) is critical to achieving rural-based growth, which is a central pillar of the PRSP. Programmes in this area are highly rated by the poor. But the impact on the poor may take some time as growth is expected to come from commercialisation, which may benefit richer farmers first. Also there are concerns about how fast demand for farm products will grow.

- Labour-intensive public works (including environmental infrastructure and rural roads) will boost employment and domestic demand, as well as building productive infrastructure. International experience with public works is mixed and suggests that there are macroeconomic and social risks and that benefits can take time to emerge.

- Economic infrastructure (including rural roads and electrification) are the largest spending programmes and aim mainly to facilitate growth. Project studies and international evidence suggests that returns to rural roads will exceed 10%.

- Malaria, HIV/AIDS and health mutuelles and animateurs will have major social and economic benefits. There are continuing expenditure effects and concerns about the efficiency. But prevention creates savings in more expensive curative actions.

- Primary school textbooks will increase incomes directly. For example, in Uganda, a year of primary education adds 5% to incomes on average.

- Skills development (youth, women and small-businesses) and adult literacy are modest programmes to increase incomes and social cohesion.

- Support for local authority (gacaca) aims to help reconciliation and social cohesion.

- Demobilisation and reintegration also aims to help reduce tensions. Ex-combatants are also supported in taking up employment.

- Shelter provision for the homeless is mainly a welfare programme to reduce poverty.

- Development of sector strategies will improve the efficiency and effectiveness of all programmes.

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6 Much of the remainder is allocated to local health services outside the health priority defined here.
Additional Expenditure Priorities. The PSIA identifies some priorities which have not been included in the PRSP, including: land reform, family planning, soil conservation and water supply. Many of the priorities (and the non-priorities) are linked.

A Macroeconomic Consistency Model. The study developed a macroeconomic consistency model, which provides a framework for quantifying the various concerns described above. In the model, assumptions on the growth and poverty effects of PRSP spending are built into sectoral and income projections. The model also incorporates behavioural features, including links between: the real exchange rate and aid inflows; GDP and government expenditure; output and private investment; private consumption and GDP. Inflation and world prices are treated as exogenous. Public expenditure is the policy variable.

The best estimates from this model suggest that the highest PRSP expenditure scenario will lead to a 5% higher reduction in poverty and 10% higher consumption, by 2015. If grant financing is not available to cover the full level of expenditure, there will be an increase in indebtedness. The model estimates that additional spending would increase debt service:export ratios in 2015 from 8.8% to 14.9%. This is in marked contrast to the equivalent IMF estimates, which show debt service: export ratios of 46%, even on the lowest PRSP spending scenarios.

Conclusions. The analysis concludes that the optimal level of expenditure in Rwanda is substantially higher than at present. Foreign grants should be much higher than at present and foreign loans can also be increased without macroeconomic damage, provided that:

- public expenditure is managed (by donors and government) in a way that avoids increasing suppliers’ prices
- any interest rates paid on loans are below the rate of economic growth and the returns to expenditure;
- the increased government expenditure is for temporary programmes which can be curtailed in line with any future drop in assistance or export earnings, without prejudicing the benefits achieved;
- the programmes financed are priority programmes generating sound benefits;
- there are no concerns that increased debt will create concerns amongst private investors.

In view of the above conclusions, future macroeconomic programmes need to be more explicit about the value of different types of macroeconomic indicator. Deficit targets need to take into account the distinction between cost-incurring and cost-reducing measures. Debt sustainability ratios need to focus more on future flows than on stocks. More explicit longer term planning of aid inflows need to be built into programmes.

Methodological Lessons Learnt
The PSIA suggests that recent theoretical developments can have important implications for applied policy work. It suggests that short applied studies can at least show the potential importance of theoretical work, even if longer research programmes may be required to provide more conclusive evidence.

The analysis suggests that useful conclusions can be reached using a straightforward macroeconomic consistency framework, without incorporating a comprehensive model of equilibrium behaviour.
INSTITUTIONAL IMPLICATIONS

The government’s capacity to engage in the debate needs to be reinforced by improved macroeconomic modelling capacity.

The PSIA in Rwanda emerged out of a difficult set of negotiations. The process of negotiation might benefit from the participation of a wider range of stakeholders, including wider technical consultation by the IMF, especially on the significance of sectoral projections for macroeconomic performance.
1 Introduction

1.1 THE PSIA IN RWANDA

1. The Rwanda PSIA is an attempt to address the trade-off between the needs for increased public expenditure and the concerns of macroeconomic stability and incentives in the Rwandan context. While the issue has come up in a number of countries, there is a shortage of systematic empirical studies on the issues as a whole (most studies have focused on subsets of the issues such as Dutch disease or debt sustainability). However, for policy purposes, it is necessary to make an overall judgement. The PSIA attempts to draw together evidence on the whole range of issues in order to provide a better foundation for the policy judgement.

2. This work has been done at the request of the Rwandan government, and emerges from discussion of the expenditure projections proposed in Rwanda's PRSP. In this document, the government made a case for substantial increases in expenditure. These proposals were felt by some stakeholders to be macroeconomically imprudent, and this discussion delayed the acceptance of the PRSP by the IFIs. The Rwandan government was therefore keen that the PSIA should take an independent look at the question.

3. The study has been commissioned by DFID as part of an international pilot of the methods of PSIA. It has been carried out by an independent team of researchers contracted through Oxford Policy Management. We have talked extensively to all stakeholders and were housed in the National Poverty Reduction Programme in the Ministry of Finance and Economic Development (MINECOFIN) (of which two of the researchers are employees, and for whom the team leader has carried out extensive previous consultancies); we have also talked to stakeholders including donors, the IFIs, NGOs and the private sector in Rwanda. Our findings, however, represent our views, not those of DFID, OPM, or the Rwandan government.

1.2 THE IMPORTANCE OF MACROECONOMIC STANCE FOR POVERTY REDUCTION

4. Many poor countries have a low resource base and high needs for public expenditure. Since the early 1960s, it has been suggested that external resources are needed to close the gap between the needs of development and domestically available financing. This argument was originally framed (as in the two-gap model of Chenery and Syrquin) in terms of the needs for physical investment to achieve given levels of economic growth, but is now more widely understood in terms of the need for public expenditure to achieve given rates of poverty reduction. Plausible calculations indicate a very significant need for increased expenditures in order to achieve very basic developmental objectives and deal with crises such as the AIDS epidemic. For instance, estimates by the Committee on Macroeconomics and Health suggest that for lower-income countries in sub-Saharan Africa incremental funding needed for the health sector alone is of the order of 8% of GDP\(^7\). International commitments to increase levels of aid and to implement debt relief reflect a perception that poor countries need increased resource flows in order to reduce poverty.

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\(^7\) Sachs, cited below
5. The need for extra resources is accompanied by a need to manage resources better. Proposals for expanding expenditures therefore need to be accompanied by realistic costings. Equally, donor procedures and macroeconomic management need to be designed to maximise the efficiency with which the resources are used. Our study finds some cases where macroeconomic management can interfere with expenditure management.

6. However, concerns about the macroeconomic impact of increased resource flows have led some observers to recommend that countries with large external and/or fiscal deficits, financed by grants and international borrowing, should aim to reduce them in the medium term rather than to mobilise additional external resources. These concerns have a strong influence on the design of macroeconomic programmes under the IMF’s ESAF and PRGF initiatives, as well as the design of the HIPC initiative. They were summarised in a particularly forceful Aide-Memoire provided to the government by the IMF mission of November 2001.

7. The possibility of a conflict or trade-off between the needs for the provision of public goods and those of macroeconomic stability and incentives has been noted. For instance, there has been a substantial controversy about the possible trade-off between AIDS spending in Uganda and the macroeconomic programme. In this case, the IMF had been accused of discouraging Uganda from accepting extra aid to combat its AIDS epidemic; the IMF replied that it would not offer such advice, since the import of AIDS drugs had ‘minimal macroeconomic impact’ and the Ugandan economy was macroeconomically well managed. However, the very large sums potentially involved in tackling the AIDS epidemic and other acute health problems would imply a large increase in current account deficits both in Rwanda and in Uganda, as indicated by the estimates provided by the Committee on Macroeconomics and Health. Such increases would certainly raise concerns if any country with an IMF programme were to propose them.

The PSIA and consensus-building

8. Macroeconomic programme formulation does not require unanimity, but it is helped by a degree of consensus. Experience from other pilot PSiAs suggests that they are most likely to be useful where they are conducted on issues which are high-stakes, and on which ex ante opinions diverge. In some cases a PSIA may settle the debate, but we suspect this is rare. The more general case will be that understanding of the issues is improved and areas of disagreement clarified and hopefully narrowed.

9. In the Rwanda case, the issues involved are wide and complex and the ex ante disagreements were quite wide, both on the Rwanda case and internationally. We have not been able to draw on an international consensus about the right way to think about budget deficits in low-income countries, because no such consensus exists; we have therefore needed to do careful literature review and theoretical work as well as examining the Rwandan evidence. It is useful at the outset to say something about the source and nature of disagreements.

10. First, divergent views about resource flows are not a matter of technical competence. Views of ‘neoclassical’ economists within the IFIs about the appropriate approach to fiscal policy vary widely. Equally, concerns about the macroeconomic risks...
of expansion are not restricted to staff in the IFIs. A number of African academic economists have expressed concern about excessive aid dependency. For instance, Elbadawi\(^9\) examines the effects of aid in incentives for exports and suggests that some countries are excessively aid-dependent: and Arigo\(^10\) studies the sustainability of Nigeria’s deficit using a model derived from work\(^11\) by L. Rutayisire who is now a senior official of the National Bank of Rwanda, also with relatively conservative implications. Most strikingly, Amoako-Tuffour\(^12\) has argued against excessive aid dependency in Africa, and indeed blames IMF programme for being too expansionary: “Regardless of how capital expenditures are reported, Ghana officially enters into IMF commitments that are only partially funded by project-specific grants. The implication has been that the government is ‘drawn’ into domestic public expenditures as part of the terms of the economic aid from abroad, with the results that the counterpart domestic financing drives the economy even further away from a sustainable fiscal path”.

11. A number of general sources of disagreement run through the whole discussion and are therefore worth identifying at the outset.

12. First, many macroeconomists habitually do their analysis in terms of percentages of GDP. Estimates of needs for poverty-reduction, however, have to be done in absolute terms. If a country is very poor, the same numbers can look very large as shares of GDP and very small relative to the needs for poverty-reducing public expenditure. The danger is that undue normative significance is given to one of these descriptions. Where shares of GDP are used as a normative guide (rather than simply a descriptive number) to what deficits should be, this has a potentially regressive implication: it tends to suggest that poorer countries should receive lower per capita resource transfers in absolute terms. This implication is obviously disturbing.

13. Secondly, theory and evidence on the macroeconomic concerns about fiscal expansion is inconclusive. The theory of optimal fiscal policy for an aid recipient has not been properly developed; we make an attempt to fill this gap below. International evidence is mixed and repeatedly requires interpretation in terms of the specific structure of Rwanda’s economy. The disaggregations suggested by theory are not readily available. Finally, theory points to the importance of expectations about the future availability and terms of resources, on which views may differ.

14. It makes sense for expenditure programmes to be contingent – as the government’s own scenarios were - on the availability of different forms of financing including grants and concessional loans. The principle of contingent scenarios is supported by the IMF’s own guidelines for the PRGF\(^13\), and was allowed for in Rwanda’s ESAF by some flexibility in deficit targets. However, the appropriate range of assumptions is clearly open to debate.

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\(^9\) I. Elbadawi, External aid: help or hindrance to export orientation in Africa? Journal of African economies, volume 8, no.4, 1999


\(^11\) L. Rutayisire, Measurement of a government budget deficit and fiscal stance in a less developed economy; the case of Tanzania, 1966-84, World Development 15, 10-11, pp.1337-51, 1987

\(^12\) J. Amoako-Tuffour, Ghana government fiscal deficits: how small or how large?, Journal of African Economies vol. 8 no.1 pp.1-30

\(^13\) (Key features of PRGF-supported programs, 16 August 2000): see discussion below.
15. Thirdly, the translation of spending plans into actual expenditures is a complex process, depending on the operation of the budget system, administrative capacity and political factors. In this context our question has a certain ambiguity: should we assess the impact of spending plans assuming that the spending actually takes place, or should we attempt to estimate the possible slippage between plans and outcomes?

16. Finally, the whole approach of attempting an explicit linkage between the macroeconomic and direct poverty impacts is somewhat innovative. However, it is necessary. Even from a strictly macroeconomic point of view, the optimal level of spending depends not only on its financing but also on its composition.

17. To see the gravity of the issues involved, consider two different hypothetical forms of increased expenditures, both financed by grants: a large expansion in the public sector wage bill; and an equally expensive import of millions of doses of AIDS vaccine (not currently available, but quite possibly becoming available soon). The first of these would change incentives in the economy, possibly damaging exports, and would increase future recurrent costs. The second, besides saving millions of lives, would reduce recurrent costs (by the reduction in disease caused by the reduced prevalence of HIV) and have very little within-period impact on the macroeconomy. Yet the two actions might have the same effect on the deficit measures standardly used for macroeconomic analysis (indeed, depending on prices, the import of AIDS vaccines might be far more ‘expansionary’ on this measure). As a result, a country that adhered to a standard deficit target could well be obliged to refuse gifts of AIDS vaccines. This case illustrates the importance of relating the size of the envelope to the composition of expenditure, and of reviewing the measurement of the deficit in the light of this linkage.

1.3 METHODOLOGY

18. The Rwanda PSIA is innovative in seeking to combine macroeconomic concerns with expenditure appraisal. Reflecting the economic focus, all four members of the study team are economists. It is also ambitious in the range of questions studied even within the macroeconomic aspect. This was necessary, because a treatment that omitted any of the concerns that had been expressed about the possible macroeconomic problems caused by increased expenditure would be open to criticism on the ground that the critical effects had been ignored. Reflecting the breadth and ambition of the study, the following approaches have been used:

- **Historical narrative and description.** The PSIA emerged in the context of a policy discussion around the PRGF negotiations and we thought it appropriate to reflect this discussion in the report.

- **Specification of the proposed expenditures.** This took longer than was anticipated, reflecting the fact that the scenarios in the PRSP were prepared in anticipation of the development of sectoral strategies.

- **Some new theory.** In particular, neither the general theory of optimal policy for an aid recipient nor the conditions for debt stock ratios to be stable over time have been fully explored in the existing literature.

- **Review of international evidence.** International evidence cannot be conclusive, since there are always reasonable questions about the relevance of international experience to the particular case. Nonetheless, it is important to reflect the existing evidence as fully as possible in the discussion.
Description of the historical data in Rwanda and examination of the structure of the Rwandan economy. In some cases, such as the importance of international debt stocks for private investors and the ‘use it or lose it’ constraint, we held meetings with stakeholders to discuss their perceptions of the likely effects. We also used evidence from the household survey and the existing poverty profile, as well as other studies (notably the Food Security project supported by Michigan State University and housed in MINAGRI) to examine the structure of the economy.

Some time-series econometrics. Given the instability of the periods over which relations are estimated, it is perhaps not surprising that the results are not altogether robust and are sometimes contrary to theory.

The construction of a macroeconomic consistency model.

19. In the case of the econometrics and the consistency model, we do not claim that this work is as rigorous as would be possible in a study devoted solely to these subjects. However, the econometrics is of interest, and the construction of a simple consistency model is an important operational need for the Rwandan government. We therefore present the formal results of this work in the annexes, and try to make it clear in the text how far our main conclusions depend on the modelling results.

20. Methods for the expenditure analysis are discussed in more detail in section 3.3 and 3.4.

1.4 THE STRUCTURE OF THE REPORT

21. Section 2 sets out the Rwandan context and the issues involved in the PSIA more fully, and specifies exactly the alternative expenditures to be considered.

22. Section 3 sets out a simple general theoretical model to elucidate the issue. This section contains an algebraic presentation which some readers may prefer to omit (though the researchers have found this presentation useful in identifying some central ambiguities in the debate).

23. The next three sections consider the impact of the expenditures. Section 4 examines the demand-side impact of the expenditures. Section 5 considers the macroeconomic and policy considerations in assessing he likely benefit of the expenditures. Section 6 considers the direct impact of the goods and services financed by the expenditures on poverty and social development.

24. Section 7 pulls the argument together, using the consistency model developed in Annex 6. It also draws lessons for policy stance, the selection of indicators to monitor, and the process of policymaking and international assistance.

25. Section 8 provides a brief summary of the report’s main findings.

26. The annexes offer some detailed technical work. Annex 6 outlines a simple macroeconomic model. This is essentially a macroeconomic consistency of the same kind as the World Bank’s RMSIM model and the models used by the IMF missions to prepare their forecasts, but it integrates some of the effects of public expenditure on aggregate and sectoral supply.
2  Public expenditure, macroeconomic development and poverty reduction in Rwanda

2.1 THE RWANDAN CONTEXT

27. In 1994, Rwanda experienced a genocide in which more than 10% of the country’s population are believed to have died. The genocide ended when the RPF, which had been fighting a civil war against the government, took power in mid-1994. Reconstruction has been in progress ever since, and a great deal has been achieved. However, Rwanda remains poorer than it was before the genocide and there are very significant remaining tasks, including the trial and reintegration into society of more than 5% of the adult male population who are currently in prison on charges relating to the genocide.

28. From the 1980s onwards, Rwanda suffered from a combination of high rates of population growth, (resulting in one of the highest rural population densities in Africa) declining agricultural productivity (in part due to a decline in soil fertility), environmental degradation and falling per capita GDP. The economy has a very weak export base, with high dependence on agricultural exports, in particular tea and coffee, and a resulting vulnerability to declines in world prices. The revenue base is very small and private investment levels are low. The PRSP document speculates that net smallholder investment in agriculture may have been negative in the 1990s. Given that 90% of the population lives in the rural sector, this decline in rural sector performance presents a huge challenge for government.

29. It was against this background that the genocide of 1994 took place. The legacy of this lives on, particularly in terms of decapitalisation in the rural sector, with destruction of livestock and infrastructure, the burden of the large prisoner population awaiting trial on their families, the legal system and the prison service, and the creation of significant numbers of female-headed and child-headed families who are often short of labour resources.

30. A great deal has been achieved since the genocide, but it is vital to appreciate that Rwanda remains much poorer than it was before 1994 and that in many respects Rwanda is still recovering from the genocide. For instance, extrapolations forward from the 1985 household survey give headcount ratios (proportions of people below the poverty line) of 48% in 1985 and 68% in 2000 (the number was already rising before the genocide and shot up to over 80% after the genocide). Similarly, child mortality (the proportion of children dying before their fifth birthday) has risen from 150 in the period 1987-92 to 196 in the period 1996-2000. Evidence from the SCF food economy studies in the late 1990s showed that poor households typically had lost significant proportions of their livestock, and this has seriously affected the use of manure. Tea volumes have

\[ \text{Draft PRSP, March 2002} \]
\[ \text{The poverty line used for analysis of the household survey of 2000 is not directly comparable with that used in the 1985 survey, so time-series evidence has been estimated by extrapolating forward using macroeconomic evidence on consumption. However, the direct estimates from the 2000 survey do turn out to give a very similar estimate of the headcount.} \]
recovered, but coffee volumes have not. These facts reflect a sharp deterioration experienced as a result of the genocide, followed by recovery. GDP per capita peaked in 1983, declined markedly by 1993, and then collapsed; in 2001 it overtook its level of 1993, but remains well below its peak of the early 1980s. Because inequality has increased, the recovery of GDP to the 1993 level does not imply a recovery in poverty levels. There is some concern, also, that the recovery may be faltering; GDP growth in the last two years has slowed to around 6-7%, even though many aspects of recovery are clearly incomplete.

![Real GDP per capita in Rwanda, 1982-2001](image)

### FIGURE 2.1 REAL GDP PER CAPITA IN RWANDA, 1982-2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Rural</th>
<th>Urban</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1985</td>
<td>48.4</td>
<td>16.1</td>
<td>45.7</td>
</tr>
<tr>
<td>1990</td>
<td>50.3</td>
<td>16.8</td>
<td>47.5</td>
</tr>
<tr>
<td>1994</td>
<td>82.4</td>
<td>27.5</td>
<td>77.8</td>
</tr>
<tr>
<td>1995</td>
<td>76.6</td>
<td>25.5</td>
<td>72.4</td>
</tr>
<tr>
<td>1996</td>
<td>75.3</td>
<td>25.1</td>
<td>71.1</td>
</tr>
<tr>
<td>1997</td>
<td>74.1</td>
<td>24.7</td>
<td>70.0</td>
</tr>
<tr>
<td>1998</td>
<td>70.7</td>
<td>23.6</td>
<td>66.8</td>
</tr>
<tr>
<td>1999</td>
<td>69.3</td>
<td>23.1</td>
<td>65.4</td>
</tr>
<tr>
<td>2000 est.</td>
<td>67.9</td>
<td>22.6</td>
<td>64.1</td>
</tr>
</tbody>
</table>

**Source:** 1985 Household Survey, Rwanda PRSP

31. Aid within the budget is plotted in Chapter 4. Aid outside the budget rose dramatically in the later 1990s, but it is hard to get reliable data on this. In particular, some international data sources give levels of per capita aid to Rwanda in the mid-1990s that appear to be exaggerated, possibly based on commitments rather than disbursements and reflecting the temporary drop in population of the mid-1990s.
32. In 1998, Rwanda agreed with the IMF on the design of an Extended Structural Adjustment Facility, later termed a Poverty Reduction and Growth Facility. This programme provided the basis of restored macroeconomic stability; inflation rates are shown in Chapter 4.

33. In the political sphere, security has vastly improved since the end of the insurgency of 1997, and the holding of local elections in early 1999 and 2001 is widely felt to have greatly improved the atmosphere. However, external security will not be assured until the conflict in Congo is resolved, and reconciliation is an ongoing challenge. Equally, over 100,000 people – including more than 5% of the adult male population - are in prison awaiting trial on genocide charges; their successful reintegration into the community will be an important part of achieving normality. The development of an open and inclusive political system is also a major challenge. In a context where a genocidal ideology had been widely disseminated, inclusive and democratic political debate will require the development of some mutual trust among the participants; this form of trust will be a precondition for durable political freedoms. Rwanda remains in a state of political transition, and has yet to develop an environment in which open opposition is accepted as a normal part of politics.

34. In the aftermath of the civil war Rwanda suffered very seriously from repeated insurgencies from forces in the Democratic Republic of Congo. In response to this, Rwanda sent forces into Congo in 1999. These forces and rebel allies gained control of a substantial proportion of Congo. The civil war in Congo has involved great loss of life, particularly because of the consequences of population movement in a society with very limited infrastructure; one survey of households in affected areas produced an estimate that 2 million people had died, mostly from illnesses. Allegations have been made by a UN committee of enquiry that resources in Congo were being exploited by the Rwandan military; these allegations have been denied by the Rwandan government. The operation was, however, effective in improving security within Rwanda itself, and human rights reports show a considerable importance in the security of the north-western population during 1999 and afterwards. Under the terms of a peace agreement, all Rwandan troops were officially withdrawn in late 2002. Since the preparation of the first draft of this report, the situation has remained volatile and a reentry of Rwandan forces into Congo cannot be ruled out.

35. In short, the considerable post-genocide achievements give absolutely no grounds for complacency. Rwanda’s economy, polity and environment remain fragile and some of the causes of the economic decline of the 1980s and early 1990s are still present.

2.2 THE CASE FOR INCREASED EXPENDITURES

The case for higher expenditures in Rwanda

36. The argument for increased public expenditures in Rwanda arises from three major considerations: Rwanda’s poverty, the structure of its economy, the legacy of genocide, and the medical situation.
37. First, Rwanda is a very poor country. International work on the use of aid for poverty-reduction\textsuperscript{17} suggests that aid should be targeted at countries that are poor and have good macroeconomic management.

38. Secondly, the Rwandan economy’s underlying structure is unusual in that Rwanda is located in the middle of Africa and densely populated. Table 2.2 shows population density and arable land per capita for Rwanda (We do not have data on land with arable potential).

<table>
<thead>
<tr>
<th>TABLE 2.2 LAND DENSITY IN RWANDA AND COMPARABLE COUNTRIES</th>
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<tbody>
<tr>
<td><strong>Country</strong></td>
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<td></td>
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<tr>
<td>Countries in Africa</td>
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<td>Burundi</td>
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<tr>
<td>Democratic Rep. of Congo</td>
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<td>Ethiopia</td>
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<td>Ghana</td>
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<td>Kenya</td>
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<td>Rwanda</td>
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<td>Senegal</td>
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<td>Sierra Leone</td>
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<tr>
<td>Uganda</td>
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<tr>
<td>Low-income countries outside Africa</td>
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<tr>
<td>Bangladesh</td>
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<tr>
<td>China</td>
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<tr>
<td>India</td>
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<tr>
<td>Myanmar</td>
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<tr>
<td>Sri Lanka</td>
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<tr>
<td>Vietnam</td>
</tr>
</tbody>
</table>

**Source:** World Development Indicators, 2000/01, tables 1 and 8 (population density and ‘arable land per head’: the definition of ‘arable land’ includes land temporarily fallow but not unused or abandoned land).

39. This has two implications. First, as noted above, the pressure on land is causing substantial environmental decline which urgently needs to be reversed. For instance, one study found that Rwanda lost its superiority to other neighbouring countries in agricultural yields during the 1980s\textsuperscript{18}. Secondly, additional agricultural growth will depend not mainly on increases in area but on agricultural intensification. For instance, the projections by Mellor on increased agricultural productivity depend mainly on increased input use\textsuperscript{19}. The PRSP assumes that 75% of the target agriculture growth rate will come from increased fertiliser use. While the agricultural investments in items such as fertiliser have to be undertaken by farmers themselves, there are essential supportive public actions

\textsuperscript{17} Paul Collier and David Dollar, ‘Can the world cut poverty in half? How policy reform and effective aid can meet the International Development Goals’, World Development vol. 29, no.11, pp.1787-1802, also World Bank Policy and Research Working Paper; see also discussion in Chapter 5 of this report.


\textsuperscript{19} John Mellor, Rapid employment growth and poverty reduction: sectoral policies and implementation in Rwanda, 2001, and Productivity increasing rural public works: an interim approach to poverty reduction in Rwanda, 2002
including the improvement of extension services and transport infrastructure, as well as possible support to credit. As far as non-agricultural growth goes, this is likely to be highly dependent on the demand generated by agricultural growth. The conclusion is that sustained economic growth in Rwanda will be more dependent on public action than is the case in countries with more abundant land, because agricultural intensification implies more proactive public action than extensive agricultural growth.

40. Thirdly, there is the legacy of genocide. This includes:

- The need for rehousing.
- The backlog in the legal system.
- Some expenses for the survivors of genocide.
- The need to restore damaged human capital, including smallholder livestock.
- The need to restore human capital.
- The need to build social capital in a society that had been torn apart by conflict.

**The case for a temporary increase in some expenditures**

41. A number of the increases in expenditures proposed in the PRSP are explicitly temporary. This includes the expenditure to house the homeless, the expenditures on gacaca, and some of the expenditures on prisoners' food (if the majority of the prisoners are released soon). Expenditures on public works programmes are also intended to be partially temporary, reflecting the judgement that Rwanda has (and, even more, will have after the release of prisoners) temporarily high levels of unemployment. This unemployment should diminish over time, as increased levels of agricultural income create demand for non-agricultural goods and services and hence increased employment in rural areas.

42. The presence of some temporarily high expenditures might imply a spike in total public expenditure; however, there are other expenditures that would be expected to rise over time in line with population or in line with GDP. It may therefore be best to think of the temporary expenditures as causing a temporary increase in government expenditures as a share of GDP, rather than a temporary increase in absolute terms. Ideally, this would be captured by a set of projections over the next six to ten years, but the difficulty of operationalising the MTEF over three years and the absence of defined sectoral strategies makes this difficult at this stage.

**Exceptional expenditures in ESAF**

43. The ESAF programme and the recently negotiated PRGF made some allowance for 'exceptional' expenditures that were needed because of the consequences of genocide. These included gacaca, demobilisation, the genocide survivors's fund\(^20\), three governance commissions (the Unity and Reconciliation Commission, the Electoral Commission, and the Constitutional Commission) and three tertiary institutions, Kigali Institute of Science and Technology, Kigali institute of Education, and Kigali Institute of Health. This does not include all the needs created by the war and genocide, including support to the restoration of the rural economy and rehousing.

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\(^20\) This Fund is legally entitled to receive 5% of the previous year’s tax revenue.
2.3 THE PRSP EXPENDITURE SCENARIOS

The PRSP process
44. The PRSP process is sequential. The government typically presents an interim PRSP, which is then developed into a full PRSP. Both the interim and the final PRSPs are presented to the boards of the WB and the IMF. The acceptance of these documents by the boards is an explicit condition of debt relief under the HIPC initiative, and implicitly guides many of the actions of donors. As a result, a country unable to gain approval for its PRSP can find itself urgently strapped for cash.

45. Rwanda presented its I-PRSP in November 2000. This document was accepted by the boards of the WB and the IMF. It included a macroeconomic framework based on the existing PRGF program. Following this, in December 2000, Rwanda reached its decision point under the HIPC initiative.

46. In November 2001, Rwanda presented a draft PRSP to the donor community (not, at this stage, formally to the boards of the IFIs). This document contained expenditure scenarios and an attached macroeconomic framework. These scenarios are central to our study and it is therefore important to explain how they were developed.

Implications of the descriptive evidence for the poverty strategy
47. The PRSP is premised on a number of key judgements:

- Poverty is largely rural. The urban-rural gap revealed in the household survey data is shockingly wide even when compared to other African cases, and the share of the urban population is low.
- Agriculture and health were prioritised, based on a sectoral disaggregation of concerns expressed in the PPA. (The results may be sensitive to the sectoral definitions, but these seem reasonable).
- There is widespread rural unemployment, despite the shortage of labour experienced by some households. This is supported by participatory evidence as well as by the observed association between short hours worked and poverty.
- There is a need to increase off-farm employment, but this is constrained by demand. Agricultural growth is therefore essential to get growth moving.
- Given the shortage of land, agricultural growth will necessarily require more use of inputs and more market transactions by smallholder households. The need for more inputs is widely expressed in the PPA.
- Region- and crop--specific studies find a number of cases where fertiliser can be used profitably enough to encourage its use by smallholders.
- Traditional inputs also need to be encouraged, especially for those farmers who cannot yet use modern inputs.
- Five major reasons are given for a temporary increase in expenditure: the legacy of conflict, AIDS, temporary unemployment (reflecting the judgement that over time, this labour will be absorbed by off-farm activities), the urgency of reversing environmental decline, and the need for recapitalisation.
- Hence strong support is needed for agriculture, transport infrastructure, rural infrastructure, rural electrification: without abandoning the commitment to social sectors.
- Land rights of the poor also need strengthening.
48. These judgements to some extent imply a shift away from the social sectors towards a broader concept of poverty reduction that includes, and indeed prioritises, economic productivity. The government is particularly concerned to improve economic infrastructure. Given the numbers of poor and the rate of population growth, the PRSP states that high positive per capita growth is needed to achieve rapid poverty reduction.

PRSP growth strategy
49. The strategy for growth that emerges from these considerations is rural based, and specifically agriculturally based. Increased fertiliser use is identified as having the potential for achieving 4% of a total target growth rate in agriculture of 5.3%, i.e. 75% of total agricultural growth. In commodity terms 1/3 of the growth rate is forecast to come from bananas. This analysis is entirely supply-based, and will have to be backed up with careful market analysis of the potential for domestic consumption and export of this produce.

50. The agricultural growth strategy is complemented by an export diversification strategy, which identifies six prospective areas:

- Agro-processing
- Garment exports
- ICT services
- Tourism
- Mining
- Export of skills at a regional level

51. Many of these activities will take time to have much impact on the macroeconomy. In acknowledgement of this and the current underemployment in rural areas, the government proposes a short-term public works programme to provide an input of resources into the rural sector. The emphasis will be on environmentally sustainable and conservation activities.

52. This overall strategy now has to be translated into sectoral strategies, and reflected in national and sectoral MTEF processes. This will be complicated by the decentralization process currently being implemented. The role of national ministries is changing to that of developing policy and guidelines, rather than implementation, which will devolve to local government.

How the scenarios were developed
53. The expenditure scenarios presented in the PRSP represented the outcome of a substantial technical and participatory process.21

54. As part of the work for the PRSP, a major costing study was undertaken to derive the needs of expenditure on high-priority anti-poverty programmes.22 The programmes were those already identified as high-priority. Ministries were asked to prepare estimates

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21 Three of the authors of the current study were involved in this process.
22 Rwanda: Costing of Poverty Reduction Strategy Paper Programmes, REPIM 2001 (John Mackinnon and John Short)
of the costs of their needs, subject to constraints of practicality rather than fiscal constraints.

55. The success of this exercise varied across ministries. One difficulty was the use of different programme classifications in recurrent and development budgets, leading in some cases to the omission of development costs from the estimates. The most serious gap at the end of the process was in agriculture; the needs for development expenditure could only be estimated in a very approximate fashion. However, the advantage of the process were the ministries were encouraged, for the first time, to link their objectives explicitly with the unit costs of inputs, and to think in a strategic perspective that identified needs rather than starting from a given budget constraint.

56. At the same time, an extensive consultative exercise was held at community level. The results are analysed and included in the PRSP, which argues that the two most important priorities that emerge are agriculture and health.

57. The submissions from the ministries were analysed in terms of the following criteria, which were presented to a national workshop and revised in the light of the workshop’s recommendations:

- Expenditures must contribute, whether directly or indirectly, to the reduction of poverty. Expenditures will be targeted at those activities that the private sector cannot realistically be expected to undertake.
- Expenditures will target those activities that can be shown to have high socio-economic impact, as measured by rates of return or other quantitative criteria.
- Expenditures will target the activities that communities have identified as important to them.
- Expenditures will be directed to well planned activities for which realistic and modest unit costs have been identified and where there is a well-developed expenditure proposal.
- In cases where the previous two criteria are not met but the activity meets the other criteria, priority will be given to supporting policy development and planning in the sector.
- Expenditures that reduce future recurrent costs will be prioritised, for instance bed-nets, non-wage funds (books, materials and teacher training) to schools, road maintenance, and water supply.
- Expenditures will be targeted at those activities which can affordably be extended to the whole relevant target population, rather than those which could only be delivered to a few.
- Activities that are labour intensive and create necessary infrastructure for development will be prioritised.
- Activities that favour disadvantaged groups, including activities which address gender or age-based inequities and protect the rights of children, and activities that reduce economic inequality will be prioritised.

58. Using the costing, the results of the consultation, and the principles of prioritisation outlined above, the PRSP was translated into three different expenditure scenarios, reflecting different assumptions about the availability of resources. The lowest scenario
was essentially the existing MTEF, whereas the two expansionary scenarios included extra expenditures that were identified as poverty-reducing.

59. An important judgement implicit in this process was that it would be difficult to compress non-priority expenditures within the existing MTEF projections, so that reallocation in a pro-poor direction had to be achieved mainly by ensuring that increases in resources went to pro-poor expenditures. This judgement was important and in retrospect it should probably have been made explicit at an earlier stage of the process; this could have stimulated debate on areas that could be cut. However, even if there is some fat in the non-priority expenditures, there are also areas which appear to be seriously under-resourced. We return to this point in section 5.

The magnitude of the expenditure scenarios

60. Table 2.3 shows the size of the proposed expenditure increases.

61. Table 2.3 shows the magnitude of the PRSP scenarios in terms of shares of GDP, real value per capita, and international comparisons (using official exchange rates). It can be seen that the two more expansionary scenarios imply major increases in public expenditure when presented as shares of GDP. The assumption is that these will be mainly funded out of an increase in external assistance, including grants and concessional lending. They would therefore require a very significant increase in external support.

62. However, there are four reasons why Scenarios 2 and 3 may be less expansionary than they look. First, they assume 100% implementation of development expenditure. If the implementation achieved corresponds with performance in previous years, then the forecast public expenditure should be significantly less than this. Secondly, the scenarios cover some areas that have been previously financed off-budget, including some support to public works and to housing (both of which have been supported by donor transfers to NGOs that have not been included in the budget). Figures for total aid flow published by the government indicate that there may be a significant amount of assistance off-budget (much of which is currently outside government’s control, but some of which it may be possible to use for PRSP activities in future if donors are committed to supporting the PRSP). Thirdly, the scenarios are contingent on the availability of external resources. They were intended to guide for expenditure should extra external resources become available, and to guide donors about the level of support that could be put to good use in Rwanda. This exercise made sense because it was judged that some extra resources could be unlocked by a good PRSP, but they were not based on estimates of probable donor funding. Finally, these scenarios assume that GDP growth in the three years is not affected; in practice there should be some impact.

63. The inclusion of data from 1990 shows that Rwanda is only now regaining levels of real public expenditure, in per capita terms and as shares of GDP, compared to levels observed a decade ago. In the interim, many expenditure needs have increased.
### TABLE 2.3 THE PRSP EXPENDITURE SCENARIOS

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### Per capita expenditure in US$

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### Total expenditure in % of GDP

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The sectoral allocation of expenditures

64. The lowest scenario was intended to be equivalent to the already proposed expenditure programme under the programme with the IMF. The second scenario envisages additional expenditure on labour intensive public works, road maintenance and rehabilitation, emergency roofing and water harvesting kits, and additional support for health education and agricultural services. The most expansive scenario also includes substantial amounts for road construction and tertiary education; this scenario is closely related to the unconstrained projections offered by the ministries themselves, and also reflects the importance the government attaches to infrastructural investment.

65. The lowest scenario was originally intended to be equivalent to the already proposed expenditure programme under the programme with the IMF. However, at a late stage of the preparation of the PRSP, other expenditures were added to the MTEF projections that implied an expansion in the programme. Over time, this baseline scenario was revised as part of the PRGF negotiations and we understand that the revised version is now consistent with the programme.

66. The second scenario envisages additional expenditure on labour intensive public works, road maintenance and rehabilitation, emergency roofing and water harvesting kits, and additional support for health education and agricultural services. This scenario was derived by adding an arbitrary total of about 50 billion Rwanda francs (about $100 million dollars) to the existing resources.

67. The most expansive scenario also includes substantial amounts for road construction and tertiary education; this scenario is closely related to the unconstrained projections offered by the ministries themselves, and also reflects the importance the government attaches to infrastructural investment. This scenario is meant to be financially unconstrained; it represents an upper limit of what the government could do with extra resources to combat poverty now.

68. The tables which follow are based on data from the most recent version of the 2002 budget (as of June 2002). During the process of negotiation with the IMF on the PRGF, the overall level of budgetary expenditures for 2002 were reduced, and this is reflected in the tables. A number of key areas were ring-fenced in the budget reductions, to be protected. In the most recent expenditure figures, the amounts ring-fenced actually increased, as allocations under decentralisation and the common development fund were added, while certain programmes under health, education and youth and sports were reclassified as non-ring-fenced, compared to 2001. Certain areas regarded as exceptional expenditures were also protected.

69. The expenditure analysis focuses on the additional expenditures proposed under the PRSP, should funding become available. Table 2.4 shows the overall amounts whereby expenditure would increase for the different scenarios, by ministry, for the three years of the PRSP taken as a whole.

70. Perhaps the most striking factor is the overall size of the increases by ministry. Whereas for the ministries of Health (Minisante) and education (Mineduc) the overall increases in both recurrent and development budget represent not more than 10-25% of their annual budget, even under the more expansive scenario, for Minagri, the increase in overall budget under scenario three represents an annual 50% of the baseline budget, for Minitraco this is around 100% (mainly on road maintenance and rehabilitation) and for
Minirena scenario three would give the ministry 130% more each year to spend on power generation and water supply.
### TABLE 2.4 ADDITIONAL EXPENDITURE SCENARIOS IN PRSP, BY MINISTRY, 2002-2004 (3 YEAR TOTALS)

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<th>Baseline Scenario</th>
<th>Increases Scenario 2</th>
<th>Increases Scenario 3</th>
<th>Activities</th>
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- Intensifying small-scale agriculture and livestock
- Labour-intensive public works
- Malaria and HIV/AIDS + substantial hospital rehabilitation and equipment
- Textbooks + rehabilitation and equipment + investment in higher education
- Economic infrastructure
- (road maintenance and rehabilitation)
- Economic infrastructure
- (power generation, electrification master plan, urban and rural water supply)
- Skills development
- Shelter provision for the homeless, Land titling
- Adult literacy
- Export promotion, craft industry
71. In addition there are other areas which may be of importance, in particular from the perspective of the policy environment where increased expenditure may be envisaged or important.

**TABLE 2.5 BREAKDOWN OF ADDITIONAL EXPENDITURES UNDER PRSP SCENARIO, 2002-4**

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<td>% Increase on health</td>
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<td>% Increase on education (including skills and literacy)</td>
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<td>% Increase on shelter</td>
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<tr>
<td>% Increase on agriculture and public works</td>
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72. Table 2.5 shows the distribution of proposed expenditures under the two additional scenarios by broad category. The striking aspect here is the dominance of expenditure on economic infrastructure. This can be seen as a reflection of the importance that the government places on growth as the engine for poverty reduction.

**Assumptions in the expenditure scenarios**

73. The expenditure scenarios were based on a number of more or less explicit assumptions. First, some part of the increase in expenditures was intended to be temporary. Secondly, the expenditures are assumed to be technically feasible given existing capacity. In the costing exercise, ministries were asked to bear this constraint in mind, but the realism of this assumption is clearly open to debate. It is also assumed that aid financing is available, in a flexible enough form to allow the services to be delivered in the most efficient way. Finally, it is assumed that nonpriority expenditures can be restrained during the expansion of priority areas.

**2.4 THE CASE FOR MACROECONOMIC RESTRAINT**

74. In November 2001, an IMF mission visited Rwanda to start discussions for a PRGF arrangement to replace the ESAF arrangement which was due to expire. This mission raised concerns about the macroeconomic implications of the PRSP projections.

75. First, the mission stated that the macroeconomic framework in which the scenarios was embedded were macroeconomically inconsistent. In some cases national identities were violated, in other cases they were preserved only by assuming an implausible and undesirable compression of private consumption and investment. Secondly, the mission argued that even the base scenario was fiscally very expansionary relative to the projections presented in the HIPC decision point document and the I-PRSP, and could be macrconomicallly disastrous.

76. During the process of negotiation, attention was focused on the baseline scenario, so that the differences under discussion were not the expansions in poverty-related expenditure discussed in the PRSP but the additional items in the baseline case. However, the underlying issue is wider than the narrower ranges of options that were explicitly considered in the negotiations, and the differences radically affect the resources available for poverty reduction.
Macroeconomic concerns with the PRSP scenarios can be summarised under the following main categories:

- **Inflation.** Although Rwanda has been a low-inflation country in recent years, it was feared that the expansions in expenditure would set up future inflationary pressures by incurring commitments to future expenditure which would persist after donor inflows were reduced. The appropriate inflation target has also been a matter of discussion, with some observers arguing for a higher target than the 3% in the programme.

- **Sustainability and dependence.** The IMF mission was particularly concerned about debt sustainability, arguing that the country would ‘never recover’ from the increase in indebtedness. Particular attention was paid to the implications of extra spending for the time path of the debt stock/exports ratio. Similar concerns are often phrased in terms of the extent of dependency on foreign assistance.

- **Dutch disease and other effects on domestic demand.** There was some appreciation of the real exchange rate during part of 2001, but this is against a background of depreciation of the real exchange rate for the three previous years. Nonetheless, the real exchange rate is probably appreciated relative to the level it would exhibit if there were no foreign aid, and it is at least plausible that increased aid might increase the real exchange rate further. However, the appreciation in the real exchange rate is not necessarily undesirable; moreover, there are other possible effects from increased domestic demand, such as increased employment. The overall effects therefore require investigation.

- **Optimal size of the public sector.**

- **Private investment.** A number of IMF documents on Rwanda have argued strongly that debt overhangs are a powerful disincentive to private investment in Rwanda, and hence that any increase in debt stock as a proportion of GDP would be damaging to economic growth. However, there was a shortage of country-specific evidence on this point.

- **Absorptive capacity.** Some observers considered the expansionary scenarios unrealistic because of the signs of weak implementation ratios on existing projects.

- **Uncertainties about resource flows.** Rwanda has in the recent past experienced severe uncertainty about resource flows, partly because some donor funds were cut off when Rwandan troops entered the Democratic Republic of Congo.

- **Revenue-raising capacity.** The scope for increasing domestic revenue has been controversial. During 2001, the IMF was more optimistic than the government about revenue projections for the next year.

- **Fungibility and transparency:** The Fund mission raised concerns about the increases in ‘non-priority’ expenditures in the revised baseline scenario. More broadly, there is a set of underlying concerns about whether increased aggregate expenditures would not in fact leak into areas that have little direct poverty-reducing impact.

- **Macroeconomic consistency.** The Mission’s Aide-Memoire found that the higher macroeconomic scenarios in the PRSP violated the national income identities, and the baseline scenario involved an implausible compression of the current-account deficit.
78. The 2001 Mission’s Aide-Memoire is a useful (although arguably overstated) summary of these macroeconomic concerns, which are the main focus of our discussion in Section 4. The Mission was also clearly right to point out that the macroeconomic frameworks needed revisiting. However, the technical deficiencies of the framework did not affect the fundamental point at issue, which was this: did Rwanda need more resources to address the needs of poverty reduction, and were the PRSP expenditure scenarios a suitable set of priorities?

79. For this purpose, the main focus needs to be on the higher scenarios proposed in the PRSP. Under the PRGF, it is explicitly argued that if estimates of costs show that a country needs more money, the PRSP and PRGF should serve as an instrument to attract the needed funds. Serious consideration of the government’s case for extra funds would therefore have been good practice as part of the PRGF framework. Operationally, one way to do this would be to allow the PRGF documents to include multiple scenarios, depending on the availability of funds. Macroeconomic concerns need to be weighed against other concerns, including environmental and political sustainability, rather than treated as absolutely overriding, especially when the risks involved on both sides are very much matters of judgement.

2.5 THE PROCESS OF NEGOTIATION

80. The process of negotiation was quite lengthy. The government’s position in this process was weakened by a number of factors. First, much other donor support is conditional on the government having an agreed programme with the IMF. DFID wrote to the government during the negotiations encouraging them to reach agreement with the IMF. Secondly, future HIPC resources are tied very closely to projections of specific debt indicators. The use of these indicators is discussed below in Section 4. There was a risk that a disagreement with the IMF would weaken Rwanda’s case for approval of HIPC relief or for any enhancement. Thirdly, the country’s current fiscal position was extremely tight, partly because of delays in disbursements of EU budget support. We have been assured by the EU that these delays were not related to the macroeconomic negotiations but were purely administrative in nature. The consequence was that the government had extreme difficulty paying local salaries to local administration. Finally, the government did not have the capacity to produce its own scenarios to compare with the IMF model, so that the macroeconomic scenarios used in the negotiations were prepared by the IMF and understandably reflected the IMF’s concerns.

81. During the negotiations, the differences discussed were those between the baseline scenario and the IMF’s recommendations. As far as we understand, the higher scenarios – with the major increases in poverty-reducing expenditures – were not discussed.

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23 Aide Memoire of the IMF mission to Kigali, November 5-19, 2001, especially Appendix1, Rwanda: analysis of the authorities’ medium-term macroeconomic framework for the poverty reduction strategy paper (PRSP)

24 A Fund document on the PRGF says ‘programs could define contingent expenditures (drawing on priorities set in the PRSP) that would be executed if additional fungible external assistance on concessional term were forthcoming. Indeed, it would be desirable that all PRGF-supported programs have this feature, in place of the standard but much-misunderstood adjuster for deviations in program financing’. (Key features of PRGF-supported programs, 16 August 2000).
The agreement reached was much closer to the IMF’s initial position than to the government’s initial position. After negotiation, agreement was reached on a macroeconomic framework in which the fiscal deficit is less important than the one projected by the government (9.9% of GDP for the overall fiscal deficit without grants for year 2002 in the baseline scenario compared to a 13% of GDP fiscal deficit in the 2002 budget) implying a revision of the 2002 budget.

To better understand the reason why the budget for 2002 was revised, one should take into account its comparison not only with the actual figures for the budget 2001 but also with the projected budget 2002 contained in the memorandum of economic and financial policies (MEFP) of the Government of September 2001 under the previous PRGF program. Comparisons show that while the total revenue envelope (without grants) is not very different in the three sets of fiscal figures (11.43% of GDP in 2001; 11.52% projected in September 2001 MEFP and 11.57% in the 2002 budget), the total expenditure is much larger in the 2002 budget, resulting in a bigger overall deficit excluding grants (9.53% of GDP in 2001 and 8.93% projected in September 2001 MEFP against 13.67% in 2002 budget).

The downwards revision of the budget, as noted above was not achieved mainly by cutting the PRSP expansions – which were not taken into consideration anyway - but by increasing VAT by 17 to 18%, postponing a decision on government support to the housing loan corporation, cutting support to the commune development funds (which is intended to be the mechanism for decentralising the development budget) and reducing the implementation rates assumed for projects on the development budget. Although IMF pressure was important, the government may itself have come to feel that the initial budget had been too expansionary, given the purposes for which the money was being used.

However, the long-run question of financing ant-poverty expenditures out of increased external resources remained unsettled. As a result, the PRGF document specifies that if expenditures can be identified with ‘no macroeconomic impact’ and financed by extra grants, the programme may be revised in future years to accommodate this.

The letter of intent along with the memorandum of economic and financial policy of the GoR was then presented to and approved by the board of the IMF on 24 July 2002. The PRSP was then presented and approved by the boards of the IMF and the World Bank (on 8th August 2002).

2.6 RELATING MACROECONOMIC AND OTHER CONCERNS: THE PSIA AND FUTURE DEBATE

The Rwandan government saw the preparation of the PSIA as an opportunity to explore further the issues which had delayed their agreement with the IMF. It was agreed that the findings of the PSIA would be used to redesign the programme at its first annual review. This has produced a rather different PSIA to those found in other pilots; rather than examining a single expenditure or revenue policy within a given overall envelope, we are examining the overall envelope itself. This involves a more radical examination of the assumptions behind macroeconomic programming than has been undertaken in other studies. Our experience suggests that a clean separation between macroeconomic and sectoral questions is not desirable. It is impossible to make a sound macroeconomic
judgement on the overall programme without examining aspects of the composition and financing of expenditure, and existing macroeconomic indicators are not flexible enough to catch all the important connections.

The expenditure proposals and the counterfactual

88. In order to provide a firm target for our assessment, we have had to identify a clear set of additional expenditures that are proposed. We have used the expanded scenarios in the revised PRSP draft of June 2002. The advantage of this approach is that the scenarios are already costed and relatively well-defined. Even so, interpreting the actions in concrete terms posed some problems for the researchers (discussed below in section 5). The expansions detailed are intended to be contingent on resource availability, and the question is: what would the effect of funding these increases in expenditure be on poverty and social development, depending on the form of financing used? We have also considered those areas where additional expenditures may be needed for poverty-reduction that were not included in the PRSP scenarios.

89. It is also important to specify the counterfactual on the financing side. As discussed below in section 3, it makes a huge difference to optimal policy whether aid money that is not spent in the current period can be saved and spent in future periods. If it can be saved, then this may be the optimal thing to do; if not, the optimal thing will often be to spend it rather than turn it down. We discussed this issue with donors, but got fewer answers than we were hoping for. Our assessment is that the scope for doing this is limited. Within a given programme period, it may be possible to transfer funds between years; discussions with the EU indicated that this is possible. DFID sometimes discuss the possibility of bringing funds forward, but although there is a ten-year agreement, the absolute amount available each year is determined by DFID’s annual budget. Projects can be delayed, but not usually indefinitely. In general, we do not think that donors would be happy to see their money simply put in the bank by a recipient country, nor are donor agencies always able themselves to keep money that has been underspent in the current year (indeed, underspending may lead both to the underspent funds being clawed back by a donor’s ministry of finance and to a cut in budgets in future years). For this reason, most of our discussion focuses on the case where the money has to be spent when offered – the absolute ‘use it or lose it’ constraint. But the point is important, and we return to it in discussing the procedural reforms that could help make better expenditure decisions possible.

Methodology

90. The study’s main task is the assessment of the overall impact on poverty and social development of a given specification of proposed expenditure increases, including both macroeconomic effects as well as the direct impact of the goods and services supplied by public expenditure. To this end, we examine each of the sectoral and macroeconomic issues in turn, before presenting a simple macroeconomic model that puts these considerations together. The structure resembles standard macroeconomic consistency models such as the RMSM-X model and the models used in preparing IMF projections, and it has also benefited from mutual discussion with the economist working on the macroeconomic model in MINECOFIN. The assessment of the extra expenditures depends on how they are financed and on their composition; we do not explicitly model the composition effects, but we justify our assumptions about the sectoral impact of public expenditures by examining the sectoral pattern of the proposed expenditures. We expect this model to be controversial, and have tried to articulate the assumptions used in its construction very clearly.
91. One reaction to the issues addressed was that the PSIA was an inappropriate vehicle for the issues to be studied, because a full-scale study would require the development of a dynamic CGE model involving years of work. This argument is, we believe, unduly defeatist. In principle, a dynamic CGE model could shed light on the issues discussed here, but experience with other CGEs (see REFS) suggests that it would be unlikely to settle the debate. The main issues can be articulated with a simpler modelling approach, and many of them are in any case conceptual as much as empirical. It is true that the study involves more conceptual innovation on the macroeconomic side than most PSIAs involve, and this implies a different mix of skills in the research team; in the Rwandan case the team included four economists, two of whom focused mainly on the macroeconomic issues, while the other two focused mainly on public expenditure.

92. It has, however, been necessary to combine the modelling of the Rwandan economy with a search for international evidence and some conceptual innovation. Although some of the problems facing Rwanda are partly shared by other low-income countries, there is an acute shortage of sound theoretical treatments of the issues, and there is widespread confusion about some basic aspects such as the effect of debt relief on net inflows. Hence we have had to do more basic conceptual work than would be usual in a PSIA. Some of the discussion is unavoidably quite technical; it would not have been possible to address the issues without some technicality.

**Recommendations for optimal policy**

93. However, given the Rwandan context, we have sought to go beyond the appraisal of the impact of extra expenditures to identifying principles for optimal policy stance and for macroeconomic programme design. This involves reviewing the indicators currently used in programme design, and suggesting alternatives which offer a more fine-grained approach. In particular, deficit targets need to take into account the distinction between cost-incurred and cost-reducing measures, and the application of debt sustainability ratios in terms of debt stocks needs to be reviewed and perhaps replaced by explicit modelling of future resource flows. It also involves examining international initiatives such as HIPC to see whether they can be made more helpful for countries such as Rwanda. Also, we suggest that macroeconomic programmes should be explicitly made contingent on the availability of funds. There is a precedent for this in Rwanda’s own ESAF and it is recommended in the IMF’s own documentation on the PRGF process, and the approach would have helped in the difficult negotiations during 2002.
3 A general theoretical approach

94. Before starting the analysis, we set out a general theoretical approach.

3.1 OPTIMAL POLICY FOR AN AID RECEPIENT

95. The PSIA is concerned with the effects of a specific set of expenditure proposals on poverty, rather than the identification of the best possible set of expenditure measures. It is, however, useful to pose the question: what is the criterion for optimal expenditure policy? Posing this question formally is helpful, because it focuses attention on the exact constraints facing the government. Frustratingly, standard textbook models do not model the problem facing aid recipients; moreover, we know of no paper that has attempted to identify the optimal intertemporal expenditure programme for a country that is receiving international aid, although a number of authors have been interested in designing optimal strategies for donors to manipulate recipient governments. We have therefore had to adjust the standard models of intertemporal macroeconomics to suit this case.

96. Standard models of intertemporal macroeconomics assume that government chooses a programme for expenditures, taxation and borrowing that maximises its objectives (typically the discounted sum of social welfare) subject to an intertemporal budget constraint and the condition that its debt does not expand uncontrollably over time (the ‘transversality’ or ‘no Ponzi game’ condition). Usually, it is assumed that the growth rate of the economy is no higher than the interest rate and that the government will equate the returns to marginal expenditures with the discounted returns of the corresponding interest and principal repayment in the future. This model has to be adjusted to suit the case of aid recipients by the addition of two or three additional constraints:

97. (a) In the case of countries borrowing at concessional rates, it is easy to show that (under certainty) such a country should borrow as much as it can so long as the interest rate is smaller than the country’s growth rate. The reason for this is that a country which has a growth rate higher than an interest rate can borrow any amount without ever having to make net repayments in any period and without the debt-service ratio exploding. In this case the country will eventually run into a quantity constraint on financing. In the optimal expenditure programme (under certainty) such a constraint must bind at some future time if not in the current period.

98. (b) The country will almost certainly face a quantity constraint on grants.

99. (c) In addition, the country may face a ‘use it or lose it’ constraint. This means that aid is not intertemporally fungible; donors offer resources for expenditures to be undertaken in a given period, rather than resources that can be saved and spent in future periods. In the case of an absolute use it or lose it constraint, the country loses aid one-for-one for a reduction in current expenditures; in a less extreme case, the country loses some of the money it does not spend. Naturally, this constraint makes a significant difference to the country’s optimal expenditure programme; the imposition of the

\[25 \text{See, for instance, the models in O.Blanchard and S.Fischer, Lectures on macroeconomics}\]
constraint makes it optimal to spend more in the current period than would otherwise be the case. The constraint is damaging, in the sense that it distorts government decisions and leads to lower social welfare.

100. This model (which is presented more formally in Annex 1) illuminates some ambiguities in the debate over the use of external resources.

101. In the case of grant-financed expenditure, there are two possible reasons for opposing extra expenditures:

- The advice to restrain grants-financed expenditures might be motivated by the view that government does not face a ‘use it or lose it’ constraint, and should regard extra grants as temporary income; in this case, standard economic theory suggests that the country will wish to save much of it unless the country faces a credit constraint. If the country does face a credit constraint, returns to expenditure may be higher than those to saving the money and the country may then choose to spend all the grants anyway.

- An alternative reason for restraining grants would be that even though the country faces an absolute ‘use it or lose it’ constraint, the net returns to public expenditure in the current period are zero once the macroeconomic damage is taken into account. This is a very much stronger position, and several qualified observers have expressed astonishment that it could be seriously entertained.

102. In the case of expenditure financed by concessional borrowing, there are three possible reasons for resisting extra expenditures;

- The quantity constraint binds in future periods, so that borrowing more now implies higher net repayments and hence higher net outflow in future periods, when discounted returns may be higher than they are now.

- There is an intertemporal quantity constraint but no absolute ‘use it or lose it’ constraint, so that money can be held over and borrowed later.

- The net impact of extra spending is less than the concessional interest rate (usually negative in real terms), when macro effects (including the impact of the debt overhang) are taken into account.

103. The ‘use it or lose it’ constraint therefore makes a big difference, which has not been recognised in the existing theoretical literature. Existing policy recommendations, including those of the IMF, have not usually made their assumptions about their constraint explicit (reflecting the conceptual gap in the theory). Overall, the most appealing and consistent interpretation of the 2001 PRGF discussion was that the IMF were assuming that a ‘use it or lose it’ constraint is likely to hold for project funding and that therefore project grants should be rejected, but advising that in the event that government receives budgetary support that can be saved, the government should put the money in the bank. The government, in contrast, believed that it should have expenditure proposals prepared to which extra resources could be committed should they become available. The PRSP bolstered this view by arguing that there were in fact substantial temporary needs for expenditure, so that a temporary hump in spending was justified.
3.2 SOME FURTHER CONSIDERATIONS

104. This simple theoretical model gives a framework in which some further considerations can be addressed.

105. First, the model assumes certainty. In fact the country faces uncertainties about the resource constraints in different periods and about the rate of economic growth. These uncertainties may justify more fiscal caution than would otherwise be optimal, although they can be reduced by improved donor modalities.

106. Secondly, a more complex model could introduce intertemporal effects such as the hypothesis that a debt stock inherited from previous periods tends to reduce growth in the current period. However, it would be against the spirit of this kind of intertemporal model to treat the debt ratios as policy objectives in themselves; if they matter, they should matter because of their effect on welfare now or in the future.

107. Thirdly, multiple interest rates could be modelled.

108. Fourthly, it could be argued that government will not in fact behave optimally. In this case an external agency of restraint may increase welfare. This argument was explicitly put for the case of coffee booms in Kenya and Tanzania by Bevan, Collier and Gunning26. For instance, even if government has cost-reducing and supply-boosting expenditures available, it may devote some of its extra expenditures to cost-incurring and low-productivity items, reducing future welfare. What this suggests is that macroeconomic analysis needs to be bolstered by some scrutiny of the institutional and political processes generating expenditure decisions.

109. Finally, the constraints imposed by the donors may apply not only to the level but also to the composition of expenditure. This affects the appropriate strategy for borrowing. If an increase in current borrowing implies increased net repayments in some future period, then the government faces a trade-off between spending now and in the future; but the spending now will be on a donor-approved project, whereas the spending in the future will be out of resources that government would otherwise be free to spend as it wishes. The effect is to make the borrowing less attractive for the government.

3.3 ASSESSING THE POVERTY IMPACT OF THE INCREASED EXPENDITURE SCENARIOS

110. A central assumption of the model above, and to our whole analysis, that government spending is assumed to have a positive impact on growth and hence on poverty. This assumption is itself the subject of the other major component of our work, the analysis of the expenditures proposed in the PRSP scenarios. Although the issues in this study that had a high profile and seemed most contentious were macroeconomic in nature, and concerned the risks of adopting a more expansive fiscal stance, these have to be seen as predicated on the desirability of the additional expenditures envisaged. How important are these additional expenditures to the poverty strategy outlined in the PRSP, and how will they contribute to achieving the government’s poverty targets? This

26 D.Bevan, P.Collier and J.Gunning, Controlled open economies, OUP and Peasants and governments, OUP
has to be balanced against any possible negative effects of increasing public expenditure.

**Do the additional expenditure scenarios reflect the PRSP?**

111. This question is addressed in two ways. At a broad level, the distribution of expenditures amongst the different sectors and activities is broken down according to sector, and within sector, the eleven priority activities identified in the PRSP. This seemed one way to simplify the complex task of how to assess the impact of a public expenditure programme as a whole on poverty reduction. However, it could be seen as quite a crude way of categorizing the priorities expressed in the PRSP. Box 3.1 gives alternative ways in which those priorities could have been identified.

### Box 3.1 Prioritisation within the PRSP

The Rwanda PRSP presents its priorities in a number of different ways.

There are six broad priority areas, ranked by importance, as indicated by national consultations:

- Rural development and agricultural transformation
- Human development
- Economic infrastructure
- Governance
- Private sector development
- Institutional capacity-building

These are then translated into public actions, which include sector actions and actions on a number of cross-cutting issues such as technology, gender, environment, imidugudu (grouped settlements), HIV/AIDS, employment, capacity-building and inequality.

A policy matrix is developed for the six broad priority areas. The policy measures include specific expenditure activities, but also government actions that may not have significant expenditure implications. From this, eleven core programmes are identified as being high priority.

The PRSP also presents the strategies which communities themselves identified as high priority, in the PPA. These were taken into account when the PRSP priorities were identified.

112. Although the focus of the study was on the additional expenditure scenarios, for many activities, the additional scenarios either increased the total expenditure on activities that were already proposed under the baseline scenario, and in others accelerated the rate at which they would be undertaken. Other activities were completely financed in the baseline scenario and therefore were not included in the additional scenarios. This meant that the additional scenarios had to be analysed relative to the baseline scenario.

113. The study was undertaken at a time when the Government of Rwanda was in negotiation with the IMF over a PRGF loan. This involved changes to the baseline
A general theoretical approach

expenditure scenario, with potential consequences for the inclusion of items in the additional scenarios. Examination indicated that the items added or removed in the 2002 budget were not expenditures in the additional scenarios. However, given the changes that had happened at different stages in the PRSP development, it was important to ensure that the figures used in the study were consistent with the MTEF figures and the current PIP. This was a very time-consuming activity, and although it undoubtedly resulted in a better understanding of how the alternative scenarios related to the baseline scenario, in retrospect the marginal return to some of this work, in terms of the overall PSIA, was probably quite low.

114. The results of the work on the costings have been reported in two ways: the broad picture is presented in section 2, above, and the more detailed breakdown is presented in section 6.

Assessing the impact of expenditure on poverty

115. Public expenditure can have an impact on poverty through a number of different channels. Some of these are direct, and can reduce different aspects of poverty – income poverty, vulnerability, and limited access to basic needs poverty. The specific approach taken to public service delivery can increase the empowerment of the poor, and reduce (or increase) the marginalisation of specific groups within the poor (or increase them). Others are more indirect and they influence poverty mainly by enhancing growth.

116. The direct impact of publicly provided goods and services on the wellbeing of the poor. This includes provision of basic goods and services directly to the poor, in ways that increase their basic needs fulfilment and reduce their vulnerability. Where possible this will include an assessment of the extent to which these goods and services are targeted directly at the poor, and respond to evidence of gaps in provision. Services included in this category would include health, education, housing and direct income transfers, where applicable.

117. The standard methodology to use for ex-post studies of impact analysis is benefit-incidence analysis. For example, in assessing the impact of a vaccination campaign, surveys could be undertaken to assess what proportion of a target group was reached, how many non-target individuals benefited and what factors impeded successful achievement of the programme’s objectives. Ex-ante studies can be carried out if there is sufficient information about the nature of the service to be provided or if the intended result is to be achieved through influencing the price of goods or services. In this case, a model would be set up on the basis of behavioural assumptions, such as price elasticities, to predict the outcome of a given programme. These behavioural assumptions will often be based on past experience with similar programmes, either in the same country or in countries with similar characteristics, often geographical neighbours.

118. In this case, many of the activities outlined in the two additional scenarios are new activities. This is an important aspect of undertaking a refocusing of the policy and planning exercise, as envisaged in a PRSP. To the extent that activities are new in the Rwanda context, it will not be possible to assess their impact on the basis of past experience. It may be possible to extrapolate from experience in neighbouring countries, but this will add an additional element of guesstimation.
The impact of increases in public expenditure on poverty in Rwanda

119. For many of the activities the details of how the general approach will be implemented have not been fully developed, as yet. In some cases, such as the labour-intensive public works, the ministries concerned feel the need of external technical assistance to optimise the details of the design. However, where government decides that it is necessary for goods and services to be provided by the public sector, the impact depends very heavily on the precise manner in which those goods and services are delivered: are they targeted to specific groups in the population, will beneficiaries have to pay to receive the goods and services, will they have to travel far to receive them, are there cultural factors which could reduce access to specific groups within the population? For many of the activities envisaged within the PRSP scenarios, these questions cannot be answered at present. Where there are obvious factors which should be avoided in goods and service provision, this will be noted when the specific activity is being discussed.

120. The indirect impact on poverty, through achieving growth targets. Public expenditure in Rwanda’s PRSP is strongly linked to the implementation of the government’s growth strategy. Much of the reduction in income poverty anticipated is estimated as a direct result of the achievement of an ambitious growth rate. Therefore public expenditure plans have to be assessed in terms of the contribution they are likely to make to achieve that growth rate. The activities which are most likely to contribute to growth are infrastructure projects and support services for private sector activities. Expenditure on institutional changes that improve or clarify property rights could also have an important impact on growth, particularly given the importance of the agricultural sector in achieving the growth target contained within the PRSP.

121. The impact this will have on poverty will operate in one of two ways: some activities will enable the poor to increase their income earning opportunities directly and therefore they will benefit from first round impacts; other activities may help the better-off in the short run, but create employment opportunities for the poor in the medium term.

122. For example, in a restructured agricultural extension service, decisions will have to be made as to how much effort should be targeted on a crop such as potato, which has immediate growth potential in both domestic and regional markets, and how many resource should be allocated specifically to increasing returns to poor farmers, either through encouraging crop diversification, or encouraging better cultivation within existing cropping patterns. The first option could increase wealth in rural areas, possibly increase demand for agricultural labour, and increase demand for non-farm goods and services. In time, this will increase income-generating opportunities in the rural economy. The second, if successful, would increase the incomes of the targeted poor farmers directly, but would probably have limited linkage effects to the rest of the economy in the short to medium term. These types of choices will have a bearing on how quickly the poor can expect benefits to show.

123. These linkage effects are difficult to model in detail, particularly given the data and time available, and analysis here will be dependent on extrapolation from work on linkages done in other countries.

124. Correspondence to the expressed needs of the poor as indicated in the PPA. In preparation for the PRSP, and to validate the priorities contained in it, there were a number of surveys and studies that examined how poor people themselves see their situation, what their priorities are and what they see as their greatest lacks. These
include the National Participatory Assessment (NPA), the Core Welfare Indicators Questionnaire (CWIQ), and the Policy Relevance Test. The published reports on these are used to assess the extent to which the proposed public expenditure activities respond to the priorities of the poor themselves.\(^{27}\)

125. **The appropriate role for the public sector.** The types of goods and services which the public sector should provide to its citizens, and the conditions under which these should be provided (in particular whether they should be provided free of charge) has been a matter of some debate over the past few decades. In general it is accepted that the state should provide out of taxation certain goods and services which it would be inefficient, impractical or undesirable for the private sector to provide through the market. The classic examples given are legal frameworks and an army. Equally there are clear examples of goods and services that should be provided by the private sector in a market economy, such as television sets. In between, there are grey areas and debate as to when public provision is appropriate. In many countries, including developing countries, people pay for part or all of their health and education services, and in others these are provided free by the state either because of the perceived benefit to the economy as a whole in having an educated healthy workforce, or for reasons of equity and human rights. In some countries agricultural research in certain commodities has been privatised because the benefits are seen to accrue to a small subset of farmers who are able to finance the research themselves.\(^{28}\) Research into foodcrops is still usually financed and provided through the state, as the benefits are perceived to outweigh what poor farmers are able to pay for the research individually – an example of market failure.

126. In addition to assessing the desirability of the proposed public actions in the additional scenarios in terms of their impact on poverty, there will be a very brief assessment of whether they are appropriate for inclusion within the sphere of public action. This is particularly important in the context of Rwanda, where needs for public expenditure are high and the fiscal base is low. Public debate within Rwanda has not always clearly distinguished between the propositions that an activity is important and that it should be urgently undertaken by the state; for instance, the enhancement of capacity in information technology may be an area of high national priority but one in which the private sector\(^{29}\) should be the main agent.

127. For public provision of goods and services to be successful in achieving poverty reduction objectives, usually the final outcome will be the result of a combination of public and private goods. For example, an agricultural extension service may provide information and knowledge about the use of fertiliser, but for this to have the desired effect on farming practices, a farmer must be prepared to take the time to expose him/herself to the information and absorb it, fertiliser must be available locally at a price which makes it worthwhile to the farmer to use it, and the farmer will most likely have to have a good experience the first time fertiliser is used, to make him change his practices for the future. This latter may well be dependent on factors which are outside both the farmer's and the government's control – climate and possible price fluctuations. However, some of these factors are dependent on the policy environment within which the farmer is

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\(^{27}\) The value of this links to the extent to which expenditure plans within the PRSP are responding to the current weight placed on the poor themselves having a stake in how their society develops. This is being taken a step further in Rwanda with the pilot community action programme, *ubudehe mu kurwanya ubukene*, which involves the direct funding of a community-decided project in each cellule.

\(^{28}\) The research is, however, usually organized collectively through a national commodity association.

\(^{29}\) In this sector some private activity is philanthropic, and Rwanda might benefit from this.
operating. In general, public expenditure success is often dependent on private sector resources also being committed, and this in turn may depend on the policy environment. A number of key policy issues are identified in the PSIA as critical for the success of both private and public sector activities.

3.4 ENVIRONMENTAL, POLITICAL AND SOCIAL SUSTAINABILITY

128. One of the arguments that the Government of Rwanda has put forward in justification for the additional expenditure scenarios has been the need for particular attention to issues of environmental, political and social sustainability post-genocide. These issues, which are key for the PSIA, are distribitional or go beyond the traditional boundaries of economics. One way of thinking about the issue at stake is as a trade-off between different conceptions of sustainability: macroeconomic, environmental political and social. The concept of macroeconomic sustainability can be analysed in terms of the above model, and we discuss the meaning of debt sustainability in some detail in Section 4 below. Here we expand on environmental, political and social sustainability.

129. Environmental sustainability is very important for the success of a growth strategy based on increasing the value of agricultural production, through a combination of increased output and increased unit value. There is evidence that smallholder investment in conservation activities has fallen considerably since the mid-1990s. The PRSP quotes figures from crop surveys in 1990 and 2000 that indicate the percentage of farm households using conservation investments fell from 93% to 65% over this period, against a background of substantial environmental degradation. Alarming levels of soil erosion were documented in the 1980s. In a study assessing low-cost ways of measuring soil erosion, an average soil loss of 10.1 ton/ha/year soil was recorded for Rwanda, rising to over 17 ton/ha/year in the Southwest. There is not as yet a fully articulated strategy for addressing this. These kinds of activities would be expected to fall under the responsibility of decentralised local authorities. However, they could be covered under a public works programme, such as that proposed within the PRSP.

130. Political sustainability is extremely important in Rwanda, and a high priority for government. Post-conflict there was a total breakdown of institutions in Rwanda, and rebuilding these in a way that focuses on a national unity agenda, while recognising diversity has been one of the major challenges facing government. There are still significant national security issues associated with the war in the Congo, and related incidence of border incursions, which create a situation of unease in certain provinces. As the gacaca process succeeds in trying and returning to the community many of the prisoners who have spent many years awaiting trial for their part in the genocide, and as the army is demobilised and reintegrated into the community, this will create further challenges and opportunities for social and economic development at community level.

131. Social sustainability could be seen as the overall objective of government, i.e. the creation of an educated, healthy, contented and thus productive population that is in

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30 They are clearly very relevant to an assessment of social impact, and also to addressing broad issues of poverty reduction. However, they are not particularly easy to link into macroeconomic modeling. The somewhat broadbrush, and superficial approach taken in this study reflects the difficulties in linking qualitative and quantitative approaches, but also the ambitious topic addressed.

control of its own destiny. In Rwanda, the achievement of social sustainability would need to take into account the gender patterns, such as the multiple disadvantages of women compared to men, and the unequal burdens of women and men in the physical and social reproduction of citizens.

132. The government sees good governance as a pre-condition for poverty reduction and development. There have been a number of initiatives over the last few years to address this: a programme of public sector reform; promotion of gender equality; strengthening of the capacity of the National Unity and Reconciliation Commission and the National Human Rights Commission; rehabilitation of the justice system; and formulation and implementation of a decentralisation policy at both political and administrative levels.

133. No one argues that any of the objectives considered above are unimportant or dispensable. However, they may at times conflict. For instance, political and environmental sustainability have major expenditure implications which may be contrary to macroeconomic and debt sustainability concerns. Differences arise either because different weights are attached to the objectives, or because the requirements to achieve each objective are differently understood by different stakeholders.

134. This study can only give indications as to how the different elements proposed under the PRSP could contribute to these complex objectives. The importance of the different objectives in a context of constrained human and financial capacity is ultimately a decision that government has to make, and realistically it may be determined by the willingness of its development partners to fund the various programmes aimed at increasing environmental and political sustainability.

How is poverty understood in Rwanda?
135. The PRSP poverty assessment draws heavily on the National Participatory Assessment, as well as the statistical surveys carried out. On the basis of this, poverty is defined at individual, household and community level.

136. At the individual level, people are poor if they are confronted with a complex of inter-linked problems and cannot resolve them; do not have enough resources to satisfy their basic needs; are unable to look after themselves; or fall below a poverty line, or a food poverty line. At the household level, land owned and characteristics of the head of household are considered important criteria for identifying the poor. Households headed by widows, children, the elderly and the handicapped are particularly likely to be poor. At community level, shortage of infrastructure and natural resources are seen as useful indicators of poverty.

137. There are a number of factors associated with poverty which are seen to be common to all areas of Rwanda, in particular reduced soil fertility, fragmentation of land, decapitalisation, particularly of livestock, and physical disruption of the population, as a consequence of the genocide and the war. Although the war has affected all areas, the nature of its impact varied from province to province. Some are affected by insecurity and

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32 National Program for Strengthening Good Governance in Rwanda, March 2002
33 The latter is defined as extreme poverty in “A Profile of Poverty in Rwanda”, 2002, an analysis of the EICV.
34 PRSP
lack of housing; others are facing problems of large inflows of population into areas that are already environmentally stressed.

138. Rural unemployment and underemployment is regarded as a major cause of poverty. One estimate is that 14% of the rural population are effectively unemployed35. This has to be balanced against a perception that there are a significant number of households who may be labour deficit, as they are composed largely of women, children and the elderly.

139. The survey evidence has not as yet been analysed in a way that allows more detailed categorisation of the economic factors affecting poverty incidence. The data indicate that 90% of the population is rural, around 90% of households in the lowest three expenditure quintiles have own account agriculture as their main economic activity and relatively few households own no land at all36. Given this, it is difficult to differentiate amongst households except on the basis of demographic or geographic characteristics. It would be useful to develop a more detailed categorisation of farm households, perhaps by cropping pattern or by crop-livestock mix. The data are available to undertake this; however, it was not possible to undertake this type of analysis within the time constraints of the PSIA. There would, however, be potentially important returns to linking the EICV and the agriculture and farm surveys carried out by the Ministry of Agriculture.

Key poverty groups and gender issues

140. As indicated above, much of the analysis of poverty in Rwanda has been done on a broad stroke basis. Given that current estimates of the percentage of households below the poverty line are around 64% (down from a high of 78% in 1994), this is understandable37. The analysis of poverty incidence so far conducted tends to be disaggregated with geographically or by expenditure quintile. This is useful for identifying issues such as delivery of health and education services, but less so for examining the impact of macroeconomic policies on specific poverty groups. Where key poverty groups are identified, they tend to be in terms of household characteristics – child headed families, or widow-headed households38. Less attention has been given to another group of households who have specific labour constraints, the wives and families of prisoners, who spend considerable amounts of time travelling to feed their husbands (the survey evidence does not show whether households have members absent in prison).

141. The definition of key poverty groups in terms of household characteristics implies that priority is given to the gender analysis of poverty and anti-poverty policies. The implementation of this is beginning in Rwanda. A programme of engendering budgets (analysing the impact of, and needs for public expenditure by gender) has been started with a number of key line ministries. One major gap is in terms of disaggregated qualitative data that would give information both on gender roles and opportunities for the

36 The quintile with the highest percentage of landless (40%) is the highest quintile, indicating households who have left agriculture because they have found more remunerative occupations outside of agriculture, probably in the urban sector.
37 The estimates from the 2000 survey cannot strictly be compared with the 1985 estimates. However, forward extrapolations of the 1985 estimates (using macroeconomic data) have been regularly conducted and happen to give estimates quite close to those of the 2000 survey.
38 No official data in Rwanda disaggregates by ethnic group. This is a deliberate policy choice, which reflects the fact that ethnic information was formerly used as a tool for discrimination and ultimately genocide.
poor, but also what happens within families. It is clear that gender roles have changed substantially over the last decade in Rwanda. With so many “incomplete” families, women are participating fully in public works programmes, for example, which would not have been the case earlier. This is happening out of necessity, and there is little information on the impact this is having on other aspects of family life and other indicators of poverty.

**Poverty and income distribution**

142. Expenditure poverty can be reduced by increases in average incomes and expenditures or by improvements in distribution. The model above abstracted away from effects on distribution. In practice much of the international macroeconomic evidence focuses mainly on GDP rather than directly on poverty, but we try in what follows also to examine the distributional aspects.

**The public expenditure scenarios and poverty targets**

143. The precise indicators to be used for poverty monitoring are currently being decided based on analysis of the 2000 EICV.\(^{39}\) However, the PRSP identifies four types of indicators: outcome indicators; access indicators; process indicators and proxy indicators. Work is currently ongoing to identify proxy indicators that can be measured on an annual basis to assess the success of PRSP activities.

144. We have taken the national targets as the basis for assessing the impact of the priority activities. These are:

- To reduce the population under the poverty line from 60% to under 30% in 2015.
- To reduce population growth rate from 3.2% to 2.5% in 2010.
- To reduce the total fertility rate from 6% to 4% by 2010.
- To reduce the maternal mortality rate from 810/100,000 to 202/100,000 by 2015 and make reproductive health services available to all.
- To reduce infant mortality from 107 to 35/1000 by 2015.
- To increase net primary enrolment from 72% to 100% by 2015.
- To achieve real annual GDP growth of 7-8% until 2020.

145. These targets are not independent, and may be quite heavily interrelated. In particular, the main thrust of the PRSP is to address income poverty by achieving high levels of growth, in such as way as to ensure that the growth is pro-poor. Higher growth will also increase the domestic resources available to fund healthcare, education and family planning services.

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\(^{39}\) Enquete Integrale sur les Conditions de Vie des Menages
4 The macroeconomic implications of increased public sector demand and different methods of financing

4.1 INTRODUCTION

146. The distinction between macroeconomic and sectoral effects of public expenditure is not always clear-cut. For instance, the macroeconomic effects of public expenditure should include its effects on employment. In a country such as Rwanda, these effects are likely to be highly local, since the labour market is likely to be geographically fragmented given transport costs and the importance of casual and part-time work in the lives of the poor. Similarly, the Dutch disease effects of public expenditure depend on its composition and on the assumptions made about the tradability of different commodities.

147. As noted above, the PRGF document specifies that extra expenditures should have 'no macroeconomic impact'. We interpret this condition to refer to demand-side impacts, since the supply-side impacts should be positive if the expenditures are justified at all. However, even demand-side impact can be positive; in the Rwandan case there are likely to be some positive demand-side effects in the form of higher employment and better incentives for smallholder agriculture.

148. We have adopted the following approach to structuring our assessment. This section of the study examines the demand-side effects and the effects of different forms of financing. The next section consider the macroeconomic supply-side and fiscal effects of the increased resources, including the important question whether additional expenditures will in fact lead to increased supply of goods and services in the priority areas. Finally, section 6 considers the direct impact of the expenditures on poverty and social development, sector by sector.

149. The demand-side effects considered here were introduced in section 2.4:

- Inflation
- Revenue-raising
- Sustainability and dependence
- Dutch disease
- Private investment
- Absorptive capacity
- Uncertainties about resource flows
- Revenue-raising capacity and domestic nonbank borrowing

4.2 INFLATION AND SEIGNIORAGE

150. The PRGF document places very heavy weight on the argument that excess spending would cause inflationary pressures, suggesting that this argument persuaded the Rwandan government to reduce its spending plans. We need to ask: first, whether
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inflation is likely to be seriously damaging to poverty reduction, and if so, at what level: and secondly, what levels of expenditure can be financed.

Rwanda's experience with inflation
151. The measurement of inflation in Rwanda is sensitive to the price index chosen. Among possible indices are:

- The national price index constructed by MINECOFIN.
- The price index constructed by the Bank of Rwanda for Kigali.
- The series published in International Financial Statistics.
- The series used by the IMF to construct the real exchange rate index.
- The GDP deflator.

152. Levels and changes for four of these indices are plotted below.

FIGURE 4.1 DIFFERENT PRICE SERIES, 1990=100
It can be seen that the levels of the series are markedly different. The price level in 2000 was between 3.1 and 4.5 times its level in 1990, depending which series is used. This difference has serious potential implications for the measurement of poverty and national accounts and real exchange rates. However, the pattern of inflation year by year is similar across the different series, except for 1994 where some of the series have gaps. Rwanda experienced very high rates of inflation during the period of 1994-5, but data collection collapsed, so that timing the increases in the price level is difficult. All series, however, show substantial inflation in 1994-5, a reduction in 1996, double-digit inflation in 1997, and low, sometimes negative inflation since then.

Inflation, growth and poverty

There is no general theoretical presumption about the effects of inflation on growth. Many macroeconomic models give a positive short-term effect of unanticipated inflation on aggregate supply, but there is no presumption that such an effect can be sustained in the long term without accelerating inflation. Portfolio considerations suggest that agents may move into real assets rather than money because of inflation, increasing real investment, but the suggestion of McKinnon that real and financial assets are complements rather than substitutes in developing countries tends to undermine this argument.

The empirical evidence is fairly strong that high rates of inflation are damaging for growth. These effects do not appear to apply to very low inflation rates, but they may be highly significant for rates above 10%. Different recent studies have found different inflation rates at which the marginal impact on growth becomes negative. For instance,

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McKinnon, R., Money and capital in economic development
Sarel searches for the ‘kink’ that will give the best fit, and finds that inflation becomes harmful to growth at a level of 8%. The effects can be large; an increase from 30 to 40% reduces growth by as much as 1.7% a year. Ghosh and Phillips, by contrast, estimate that the effects start at a rate as low as 2.5%. They find that the effects of inflation are particularly strong for low levels of inflation (i.e. an increase in inflation from 10 to 20% reduces growth more than an increase from 40 to 50%) and that the results remain robust even when observations above 40% inflation are removed. An increase in inflation from 10 to 20% cuts growth by between 0.3% and 0.4%. Two caveats about these results are that they do not distinguish between anticipated and unanticipated inflation (nor between inflation planned as part of a macroeconomic programme and inflation in a context of a failed programme) and that unobserved climatic shocks may simultaneously cause an increase in inflation and a reduction in output. Ghosh and Phillips include a variable for drought but give no details on how it is measured; even with very good modelling of climate, there is likely to be an unobserved component that is correlated with both inflation and output.

An alternative approach has been taken by Bruno and Easterly. They argue that the correlation between inflation and growth becomes less significant as the frequency of the data reduces (an issue than Ghosh and Phillips also investigate). This suggests that the relation is more complex than the within-period correlation suggests. Bruno and Easterly find a relation between growth and inflation only for high-inflation episodes (inflation above 40%); for these countries, they find that growth falls during the period of very high inflation and revives strongly once the inflation stops. These findings have no implications at all for the permissible level of moderate inflation.

Rwanda’s experience approximately corresponds with the Bruno and Easterly findings. The high inflation in 1994-5 roughly coincided with a collapse in institutions, and as noted above data shortages make the exact timing of the increase in prices difficult to ascertain. Growth was strongly negative in 1994 and recovered strongly thereafter. However, the underlying causes of this pattern were of course quite unique in Rwanda’s case, though hyperinflations at the end of civil wars have been observed elsewhere (for instance in Uganda in 1986).

On the basis of this evidence, nothing definitive can be said about the effects of moderate inflation on economic growth. The balance of the evidence suggests that inflation above a certain level is damaging for inflation, and that the level where inflation becomes damaging is somewhere below 10%, but it is not possible, on current evidence, to say exactly where it lies. This is frustrating for policymakers, who want to know whether a rate of inflation of for instance 6% would be significantly worse for growth than a rate of 3%.

Apart from its impact on growth, inflation may directly affect the poor by reducing the real value of their financial assets – (cash, and savings deposits if the interest rate on these does not adjust to compensate for inflation). The analysis of money demand considered below suggests that most money is held outside the agricultural sector,

41 M.Sarel, Nonlinear effects of inflation on economic growth, IMF Staff Papers vol.43, no.1, pp.199-215, 1996
42 A.Ghosh and S.Phillips, Warning: inflation may be harmful to your growth, IMF Staff Papers vol. 45, pp.672-710, 1998
suggesting that rural households may be less vulnerable to this effect than others. One group that may be particularly vulnerable is civil servants, since inflation reduces real wages unless government responds by wage increases. This does not mean that high inflation is advisable, simply that its negative effects on poverty are likely to come through reduced economic growth rather than directly through wealth effects.

**The link between inflation and the deficit**

160. The proximate causes of inflation remain controversial. A recent study in Kenya, which has had relatively low inflation,\(^44\) finds that climatic conditions or external influences rather than fiscal impulses are responsible for starting the inflationary process. However, there is general agreement that expansion of the money supply is a necessary condition for inflation to continue. For instance, a temporary weather shock will only cause a permanent increase in the price level if there is monetary accommodation. Equally, there is general consensus that fiscal expansions financed by borrowing from the banking system can usually be expected to cause inflation.

161. The channel through which this process works is the expansion in the money supply. Hence theory suggests that deficits are inflationary only if they cause excess money creation\(^45\). In the simplest case, deficits are directly financed by money creation. There are, however, two intertemporal arguments that suggest excess expenditure may cause inflation even if it is not accompanied by monetary expansion. The first is that the expenditure in the current period causes pressures for higher expenditure in future periods and that this expenditure will inevitably be at least partially financed by money creation. Hence, deficits now imply inflation at some time in the future. The second argument is that expectations of inflation in future period will generate inflation in anticipation now. Both of these arguments rest on the implications of increased expenditure on future expenditures. This is discussed below in Section 4.4. In this section, we focus on the relation between inflation and monetary expansion in the current period.

162. The evidence in Rwanda provides no reason to doubt that the main link between fiscal expansion and inflation comes through money creation. Figure 4.3 shows the deficit (excluding grants) and money creation as percentages of GDP and the inflation rate. There appears to be a fairly close link on an annual basis between growth in both M1 and M2 and inflation as measured by the CPI.


\(^45\) For an international study finding that deficits do not in general cause inflation, see J.de Haan and D.Zehurst, The impact of government deficits on money growth in developing countries, Journal of International Money and Finance, vol. 9, pp.455-469
Public sector borrowing from the banking system and seigniorage

163. Seigniorage is defined as the increase in the government’s resources due to the expansion of the liabilities of the monetary authorities generated by increased demand for money. Generally, this can be measured either by the increase in reserve money (the change in stock), or by the flow counterpart (the interest saved by not having to borrow the money). For a credit-constrained government that cannot easily borrow commercially at the margin, the stock concept appears to be more relevant, as it measures the increase in money actually in the hands of government. To estimate the magnitude, we need to study the demand for currency and the demand for broad money; however, the government’s seigniorage is increased only by the increase in reserve money, which is related to the increase in broad money through the money multiplier.

164. The increase in the government’s ability to borrow from the banking system depends on the growth of broad money and the increase in commercial bank credit to the banking sector. The increase is given by the difference between the two. But unlike seigniorage, these resources come at the cost of interest obligations, in addition to their inflationary impact.

The scope for inflationary finance: seigniorage and financing by borrowing from the banking system

165. There is no general agreement in the literature on how to calculate seigniorage. Some authors use M1 as a basis. But M1 includes demand deposits, the counterpart to which is mainly credit to the private sector. The proper basis for seigniorage seems, rather, to be reserve money, which is currency plus bank reserves (related to demand deposits through the money multiplier). From the above results, assume a price elasticity of 1, an elasticity of income of 0.5, and a semi-elasticity of inflation of -.3 (between the estimates we get for currency and demand deposits). Reserve money was 6% of GDP in
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2001. The value of seigniorage from a projected 8% real growth rate would then be 0.2% of GDP. The response to a 10% inflation will be a 7% increase in reserve money, equivalent to 0.42% of GDP. This compares with Ghosh and Phillips’ estimates of the impact of inflation on the GDP growth rate, suggesting that the cost in GDP terms of the inflation might be approximately equal to the value of the inflation tax to revenue. For this reason, the use of inflation as a means of increasing the resource envelope does not appear to be advisable.

166. Admittedly, a higher inflation target would also allow more public sector borrowing from the banking sector. However, the long-run consequence is likely to be an increase in nominal interest rates. Unanticipated inflation will increase the resource envelope through the increase in public sector borrowing, but at a cost of increasing future inflationary expectations and the interest rates that would have to be paid on future public borrowing. The magnitude of these effects depends on the alternative assets available in the economy, and would require a model of portfolio equilibrium in financial markets to estimate fully. However, the relatively small monetary base and the weak growth of monetisation in the economy suggest that the scope for this form of inflationary finance is also very limited.

4.3 DEBT SUSTAINABILITY, GROWTH AND DEPENDENCE

167. The interpretation and use of debt sustainability ratios has been at the heart of the debate about fiscal policy in Rwanda. The IMF argued that increased borrowing would lead to an increase in the ratio of debt to exports, and would therefore inflict macroeconomic damage on Rwanda. Beyond this issue lies the design of debt relief under the HIPC initiative. The overall structure of the HIPC initiative is a broad international question. But the application of the initiative to Rwanda’s particular case should be tailored to the country’s particular circumstances. The optimal borrowing strategy for Rwanda depends on the weight given to different indicators, and this requires an examination of their theoretical and empirical basis.

Rwanda’s international debt

168. Rwanda’s external debt in 2001 is estimated at 1,320 million US dollars, of which 1,170 was owed to multilateral agencies at highly concessional rates. More than half the debt is owed to IDA, which offers a 10-year grace period, 40 years’ maturity and zero interest, but a 0.75 administration charge. In NPV terms, Rwanda’s debt commitments were estimated to be over 600% of exports in 2000.

169. Scheduled principal and interest payments came to 48 million dollars in 2001 (IMF Statistical annex). These compare with exports of 93 million dollars and total public expenditure of 345 million dollars (same source, using IFS exchange rate). Since1999, a debt trust fund has been established to pay the obligations to IDA, ADB and IFAD. In 2001, this fund was expected to pay 20 million dollars in 2001 (government note on external debt).

170. Under the terms of the enhanced HIPC agreement, the stock of debt contracted before end-1999 is to be reduced so that its NPV is 150% of exports. This implies a reduction in payments due to 22 million dollars in 2001, and the saving increases in the

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46 IMF: Rwanda, Statistical Annex, July 2002
47 Debt sustainability analysis in HIPC decision point document
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next three years. However, if HIPC is accompanied by the removal of the multilateral debt trust fund, the overall impact on repayments is only 5 million dollars in 2001, rising to 19 million dollars by 2004.

171. The size of repayments has in recent years been significantly smaller than that of new borrowing. Different sources give slightly different evolutions for the debt stock. IFS data show net new international borrowing of 94 million dollars in 2001; with scheduled principal payments of 37 million dollars, this implies gross borrowing of 131 million dollars. Net flows on debt would therefore be positive even if all scheduled obligations were borne by the government of Rwanda.

Institutional background: ratios of debt sustainability

172. The use of the term ‘sustainability’ in much of the international debt debate is strikingly different from the use that most macroeconomists would naturally give the term. For most macroeconomists, sustainability is understood in the context of a forward-looking macroeconomic model. Solutions to such models are unacceptable if certain macroeconomic ratios tend towards infinity (these conditions are know as ‘no Ponzi game’ or ‘transversality’ conditions). For instance, the ratio of a country’s debt to its GDP should not tend to infinity over time. However, the results discussed below show that it may actually be easier to sustain a high debt-GDP ratio than a low debt-GDP ratio; so a high debt-GDP ratio is not necessarily a sign that the ratio is exploding.

173. Some other authors have taken a different approach to the transversality condition, requiring not that the debt/GDP ratio is stable but that the discounted sum (present value) of repayments tends towards the outstanding present value of the debt. As Wilcox argues, the two conditions will be equivalent for economies where the interest rate paid is higher than the growth of GDP or exports (whichever is the denominator of the relevant ratio). But for economies where the interest rate is below the growth rate of the ratio, the NPV ratios can be stable even when the country never makes any net repayments, as we show below. The finding of Jha that most sub-Saharan debt is unsustainable depends on the application of the condition in terms of the present value repayments, and is therefore inappropriate for those countries where the growth rate is greater than the interest rate.

174. The international debate on debt-relief has converged on a different sense of ‘sustainability’. In this sense, sustainability is assessed by the level of debt-GDP ratios and debt-export ratios, rather than by the trends in these ratios. Debt-GDP and debt-export ratios above a certain level are therefore deemed unsustainable even if they are accompanied by high net resource inflows and show no tendency to increase over time. After extensive discussion involving the IFIs, national governments and NGO critics including the Jubilee 2000 campaign, the international programmes of debt relief have defined the achievement of ‘debt sustainability’ as an objective and have defined sustainability in terms of achieving low NPV ratios permanently.

48 D. Wilcox, The sustainability of government deficits: implications of the present-value borrowing constraint, Journal of Money, Credit and Banking, vol. 21 no.3, pp.291-306, 1989. Wilcox refers to the case of r<g as dynamic inefficiency; this is, however, likely to be a realistic case for credit-constrained economies, where the marginal product of capital may be above the interest rate. The source of the inefficiency is international capital market failure, not sub-optimal borrowing strategy.

49 R. Jha, Macroeconomics of fiscal policy in developing countries, WIDER discussion paper 2001/71
The impact of increases in public expenditure on poverty in Rwanda

175. Internationally, the aim of the enhanced HIPC initiative is to reduce the ratios of NPV to exports permanently below 150%. In very open economies where exports are above 30% of GDP and revenue effort is strong (above 15% of GDP), this target may be set lower, and the NPV is set at 250% of fiscal revenues. These targets are set for the decision point – when the agreement to implement the initiative is reached – rather than the completion point – when the initiative is actually implemented.

176. In Rwanda’s case, the decision point document of December 2000 envisaged debt relief such that it would have reduced NPV/exports to 150% at the end of 1999. This ratio was projected to increase over the next five years, to 215% in 2003, and then fall back, falling below 150% only in 2008. The increase comes from extra borrowing that was already committed by the end of 2000, as well as projected borrowing during the next few years.

177. The importance attached by the IMF to the NPV ratios became clear during the PRGF negotiations in Rwanda. The IMF’s projections devoted considerable attention to forward projections of debt stock ratios in their macroeconomic modelling, and used the delay in the achievement of the HIPC targets as a major argument for curtailing borrowing at the moment.

178. Broadly, there are four lines of argument behind the use of NPV ratios as a macroeconomic indicator. The first is that reduced NPV ratios will imply that resources can be released from interest and principal repayments to poverty-reduction. The second, which is more sophisticated, is that increased indebtedness will imply higher net outflows in some future period. The third argument is that high indebtedness reduces foreign investment or otherwise reduces economic growth. Finally, it is argued that debt reduces the government’s freedom of action, raising concerns about dependency and political sovereignty.

179. There has been controversy about the levels of the ratios used in the HIPC initiative. There are two sets of concerns, which point in opposite directions. One is that the levels of the ratios are set too high to reach sustainability. For instance, a paper by Eurodad50 relates debt service payments to needs of public expenditure for poverty reduction, and comes up with a need for steeper reductions in debt relief. Although very influential, this line of argument has a basic weakness, in that it simply ignores inflows of new borrowing. When these inflows are taken into account, higher debt-GDP ratios need not imply lower net resource inflows or lower resources for poverty reduction. The second, and opposed, set of concerns is that adherence to a low debt-GDP ratio reduces the government’s ability to contract new loans, squeezing resources available for poverty-reduction. This second set of concerns has received less international attention, but is beginning to become a serious international concern because countries benefiting from HIPC are discovering that the adherence to reduced debt ratios has costs which may very easily outweigh its benefits.

180. Beyond the controversy about the appropriate levels of the ratios lies a concern about the design of the indicators. There are at least five reasons why NPV/exports is at best only a proxy for the issues of concern. First, many hold that the use of stock ratios is essentially a proxy for future flows. Forward projections of debt over a twenty-year

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50 Putting poverty reduction first: why a poverty approach to debt sustainability must be adopted, Eurodad, October 2001 (available at www.eurodad.org)
horizon should therefore focus on the flows rather than the stocks. Moreover, the flow ratios in future periods will depend on projected growth rates and on the average maturity of the debt as well as the NPV. One counter argument is that the level of stocks is itself a determinant of private investment flows. We consider this below. Secondly, the use of exports in the denominators implies that absolutely levels of debt per capita will be particularly low for relatively closed economies such as Rwanda. This tends to increase debt relief for these countries, but will also reduce the possibilities of new borrowing. Thirdly, Rwanda’s exports, like those of other landlocked countries, are likely to be heavily understated. Rwandan farmers certainly export some produce to neighbouring countries, and this is not fully reflected in official trade statistics. Fourthly, the use of a backward-looking three-year average for export earnings further restricts the NPV ratio, because Rwanda’s exports remain disrupted by the legacy of conflict. Finally, the use of NPV means that debt sustainability can be affected by a shift in world interest rates, even when no change occurs to the projected flows for the country in any period or to any of the interest rates the country itself is paying. This makes no economic sense.

The effect of permanent reductions in NPV ratios on net resource flows

181. The implications of adopting lower NPV ratios as a macroeconomic objective are widely misunderstood. Cutting the NPV ratio by writing off existing debt and restricting new borrowing will reduce two flows: the inflow of new lending, and the outflow of principal and interest. For countries receiving concessional loans, the net effect is likely to be negative; the resources available for poverty reduction will decline. This corresponds with the IMF’s desire to reduce current account deficits in developing countries, but it cuts against the objective of freeing resources for poverty reduction or increasing aid flows to Africa (both widely published objectives of the debt-relief campaign).

182. The effect of a permanent reduction in the ratio of debt to exports to GDP depends on whether the growth rate exceeds the interest rate paid on the debt. This is simplest to demonstrate for the case where the debt’s nominal value is considered. Consider the conditions needed to keep the debt-GDP ratio constant. If \( r \) is the real interest rate, \( g \) is the real growth rate of real GDP or exports (whichever is used as the denominator of the relevant ratio), and \( D \) is the real value of debt, a constant ratio of debt to GDP implies

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\frac{\Delta D}{D} = g \quad \text{so} \quad \Delta D = gD
\]

but net inflows on debt are given by

\[
\Delta D - rD
\]

and by substitution this is equivalent to

\[
(g-r)D
\]

183. From this it can be seen that if \( g > r \) (as is generally true for concessional lending to a growing economy), then for given \( Y \), the net inflows consistent with a stable level of the debt-GDP ratio are positive and increasing in the level of debt (and hence in the level of the debt-sustainability indicator). In short:
184. If the real interest rate always exceeds the real growth rate, then the higher the ratio of debt to GDP, the higher the net inflows the country can enjoy without increasing the ratio.

185. The same result holds for the NPV ratio for infinite-horizon debt, where individual debts are never repaid but interest is levied perpetually on the debt stock in each period. Then we get, writing V for net present value, for a constant NPV ratio,

\[ \Delta V = (1-c) \Delta D = gV \]

where \( c \) is the concessional element in loans. Now net flows are given by \((\Delta D - rD)\) which is equivalent to \(gV/(1-c) - rD\), hence to \((g-r)V/(1-c)\). This will be positive provided \(g>r\), and is clearly increasing in \(V\).

186. For finite-horizon debt the mathematics becomes more complicated and the condition for net flow to be increasing in the debt stock are more complex than \(g>r\). However, if the maturity is long enough, the same result will go through. Net present value, \(V\), increases by the value of new loans minus their concessional element, \(N/(1-c)\), minus repayments, \(R\), plus a term which reflects the increase in net present value caused by future repayments coming closer, \(\Sigma (p-r)D/(1+p)^n\) where \(p\) is the discount rate used to calculate NPV, \(D_n\) is the nominal value of the debt of maturity \(n\) years ahead, and \(r\) is the concessional interest rate as before. (This term comes about because the principal repayments on debt come one period closer and their NPV therefore increases by \(pD/(1+p)^n\), whereas one period's interest payments, \(rD/(1+p)^n\), are subtracted from them).

We get, for a constant NPV ratio,

\[ \Delta V = (1-c)N - R + \Sigma (p-r)D/(1+p)^n = gV \]

where \(n\) is the maturity of debt.

net flows are now given by \((N-R-rD)\), which is equivalent to

\[ 1/(1-c)(gV - \Sigma (p-r)D/(1+p)^n + R) - R - rD \]

It can be seen that if most of the debt has a long maturity, then the middle term tends to zero and net flows tend towards

\[ 1/(1-c)(gV + R) - R - rD \]

which will be positive and increasing in a proportionate increase of \(V\), \(R\) and \(D\), provided that \(g>r\) (because the net present value of each debt is \((1-c)\) times its face value and increases as maturity approaches, so that \(V/(1-c)\) cannot be less than \(D\)).

187. It might be thought that these concerns are purely theoretical. However, this is not the case. Both internationally and in the Rwandan case, the HIPC initiative may well have the effect of reducing net inflows to the poorest countries.
The macroeconomic implications of increased public sector demand and different methods of financing

188. The IMF has prepared a document on debt sustainability after the enhanced HIPC initiative. Table 8 of the paper shows projected net resource flows for HIPCs, defined as new loans minus debt service payments of the public sector (the same definition as our theoretical model above). In most cases, these are projected to fall dramatically as a proportion of GDP over the ten year period 2000-2010. The absolute magnitude of the flows is not reported. However, using the projections for GDP growth in Table 2 of the same document, we can derive projections for net resource flows in absolute terms. These increase over the period for 10 out of the 19 countries for which projections are available. When 2% population growth is assumed, net resource flows per capita rise in only 6 of the 19 cases, and fall in the other 13. In Rwanda’s case, flows are projected to be almost exactly unchanged in real terms over the period 2000-2010, and to fall by about 20% in per capita terms (maybe more if higher population growth is assumed). These comparisons are with flows in 2000. Against a counterfactual where net flows increased in line with world GDP, the reductions would be even more dramatic.

189. It is useful to compare the levels of new borrowing that have been observed in recent years with the amounts that would be needed to keep the NPV/exports ratio constant. Net new foreign borrowing in the years 1998-2001 was 42 billion, 34 billion, 19 billion and 43 billion RWF (IFS data). Assuming a 10% growth of exports which are currently about 50 billion RWF, and a grant element of 64% on IDA terms, allowable borrowing to sustain an NPV of 150% would be not more than 21 billion RWF. This is a very significant contraction. The projected strategy is somewhat less contractionary at the moment, allowing the NPV ratio to increase in the short term, but implies further contraction in the years ahead.

190. Rwanda’s own case is further complicated by the fact that a multilateral trust fund was established in 1999 to pay Rwanda’s debt service obligations to IDA, IFAD and ADB. Rwanda thus moves from having all its obligations paid on a subset of its debt to having a proportion of its obligations written off on a larger subset. A note by the government estimates that the net reduction in government’s obligations is about 5 million dollars in 2001, rising to 19 million in 2004. Actual funding by government is reduced only from 21 million dollars in 2001 to 9 million in 2003 and 15 million in 2004.

191. In view of the findings of this section, it is unfortunate that multilateral and bilateral agencies have lent public support to the promise that HIPC relief will free resources for poverty reduction, without drawing attention to the reductions in the inflow implied by the implied strategy for future borrowing. This omission has led to widespread misunderstanding; many well-meaning people have campaigned for debt relief without realising that debt relief, combined with adherence to permanently reduced debt sustainability targets, could actually reduce the resources available to poorer countries. It is also unfortunate that the widespread focus on stock ratios has diverted attention from the crucial issue of projected flows, and the fact that the current international debt strategy is likely to reduce them. Adopting lower targets for debt sustainability ratios, as

52 Where the revised GDP projections are given only up to 2005, we simply extrapolate the last projected year forward. The projections for Chad and Sao Tome imply enormous improvements in performance.
53 This is IDA’s estimate in ‘IDA eligibility, terms and graduation policies’, World Bank web site
54 External debt service obligations and the impact of HIPC interim relief on financing the implementation of the PRSP, note for the Development Partners’ meeting, Kigali 2001.
many NGOs advocate, would be likely to reduce net inflows further – which is probably not what they intend.

192. Recent work by the IMF on assessing debt sustainability, while based on a careful analysis of risk factors for debt crises, does not take account of the theoretical significance of the distinction between cases where \( g>r \) and those where \( g<r \). This undermines the significance of the results. The problem is not solved by using NPV rather than nominal values of debt in calculating debt ratios, because the distinction is more fundamental; it is that if \( g>r \), the ratio can be held steady without ever making net repayments.

**Sustainability and future constraints on new borrowing**

193. The argument above assumed that the supply of concessional lending was in infinitely elastic supply. However, this cannot plausibly be the case. Hence (as observed in section 3) the optimal solution for a borrower may well involve a binding quantity constraint in some period. One possibility is that there is a resource constraint in the current period. Another possibility is that there is a constraint both in the current and future periods. A third is that there is a constraint in the future but not the present period. The IMF position can be represented as arguing that there is likely to be a binding quantity constraint in some future period, and that this justifies borrowing less than the maximum in the current period.

194. When such a constraint binds in a future period, there is a trade-off between expenditure in the current period and in the future (because repayments will reduce resources available for expenditure. Policy has therefore to address two things: the likely availability of funds, including both level and variance: and the extent to which the government would be able to curtail its spending in future. These issues arise not only for debt, but also for grant-financed forms of expenditure that have recurrent implications. For this reason they are discussed below in Sections 4.4 and 4.5, and then brought together in the model of section 7.

195. Debt raises some specific risks. A shock to the terms of trade would make foreign exchange more scarce and therefore increase the real cost of debt repayments by depreciating the real exchange rate, unless controls were imposed to prevent this. Another issue specific to debt is whether macroeconomic scenarios should model the possibility of default. Both of these questions should ideally be integrated into the macroeconomic model.

**Debt, political sovereignty and dependency**

196. The arguments above have shown that a conservative debt strategy will reduce resources available for poverty reduction in the short run and may reduce them permanently. However, this argument has considered only net flows of resources. A more expansionary debt strategy compensates for increased future repayments by increased inflows. In practice, these increased inflows will depend on the programmes or projects agreed with donors. For this reason, they may be considered less valuable than resources wholly within the government’s own hands.

197. The importance of this consideration will depend on how far the government has effective control over the resources that it borrows at concessional rates. In principle, the

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move towards budget support by the World Bank and other multilateral lenders should make it more possible for the lending programme to finance the expenditure proposals of the PRSP. We discuss this further in section 4.6, since the issue of government control applies also to other forms of aid.

Debt, private investment and economic growth

198. Debt may reduce private investment through crowding-out, by squeezing net flows, or by the ‘debt overhang’ effect whereby the accumulated debt stock deters investment and hence GDP growth. Since an influential paper by Paul Krugman\(^{56}\), this argument has been central to the case for debt stock rather than flow relief (see discussion in Gunter\(^{57}\)). On the other hand, current debt inflows may increase public expenditure with possible productivity gains. Estimates of the debt overhang need to account for the other effects in order to isolate the overhang effect.

199. Most studies find a negative effect of debt on growth and/or investment. For instance, Serven and Solimano\(^{58}\) find that debt reduces private investment although public investment increases it. Savvides\(^{59}\) estimates the impact of debt stocks on the possibility of debt servicing difficulties and finds that investment is reduced where debt-servicing difficulties are predicted. Greene and Villanueva\(^{60}\) find that public investment increases private investment but debt stock reduces it (the relation shifts over time, with payments key in the first period and debt stock in the second period). More recently, Elbadawi et al.\(^{61}\) regress the growth of non-traditional exports on the current debt stock (with a positive impact) and the lagged square of the debt stock. They find a debt ‘Laffer curve’ such that economic growth is maximised when debt is of 97% of GDP. Most recently, Pattillo et al.\(^{62}\) study the impact of debt overhang and find quite powerful effects on growth, such that doubling the NPV/export ratio reduces per capita growth by 0.5-1 percentage points. Surprisingly, this appears not to work through a reduction in private investment; the authors suggest that the quality of private investment drops as investors’ expectations of imminent debt crisis increase. Not all studies find this; e.g. Warner\(^{63}\) and Cohen\(^{64}\) test for the effects of debt overhang, but find that other effects are more important in explaining the fall in investment in Latin America in the early 1980s

200. However, all of the cross-country studies are theoretically flawed in that they fail to disaggregate between commercial and concessional debt in modelling the debt overhang effect. Theoretically, a debt overhang should only deter investment if it creates a


\(^{57}\) B.Gunter, What’s wrong with the HIPC initiative and what’s next? Development Policy Review vol. 20, no.1, p.5-24, 2002


\(^{59}\) Savvides, Investment lowdown in developing countries during the 1980s: debt overhang or foreign capital inflows? vol. 45, pp.363-78, 1992

\(^{60}\) J.Greene and D.Villanueva, Private investment in developing countries: an empirical analysis, IMF Staff Papers 38, 1, 33-58, 1991


\(^{62}\) C.Patillo, H.Poirson, L.Ricci, External debt and growth, IMF working paper WP/02/69, 2002

\(^{63}\) A. Warner, Mexico’s investment collapse: debt or oil? Journal of International Money and Finance, 13, 2, 239-56, 1994

\(^{64}\) D.Cohen, Low investment and large LDC debt in the 1980s, American Economic Review vol. 83 no.2 pp.437-49, 1993
likelihood of future policy reversals or default, for instance because net flows will turn negative at some future time. It would therefore be better to disaggregate between overhangs where \( r > g \), where there is a future need to adjust, and those where \( r < g \), where there is no such need. Overhangs should have different effects on investment in the two cases. Even where \( r < g \), investors might be worried by downside risk. However, if there is a problem of future downside risk, it should emerge through sensitivity analysis of the forward macroeconomic projections. If net flows are projected to be positive at all future dates, and the ratios do not explode, then there should be no cause for investors to worry. None of the above studies has a sample consisting entirely of countries whose borrowing is mainly concessional.

201. For this reason, it is hard to be sure that the international evidence that debt can deter private investment will apply to Rwanda. We discussed the effects of external debt on investment with private sector investors in Rwanda. While the investors had many concerns, including the impact of domestic public debt including payment arrears, none of them mentioned external public debt as a concern even when prompted by our questions. The attitude of international investors might, of course be different, especially since a debt crisis might affect the possibility of repatriating earnings. But in the absence of direct evidence, too much weight should not be placed on the argument.

Principles for debt strategy
202. Macroeconomic policy certainly needs to model future flows of debt repayments and allow for the downside risks involved in contracting debt now. The practice of forward modelling of stock ratios is partly a proxy for these downside effects, and probably not a good proxy. The justification that the IMF has repeatedly stressed for the use of debt stocks— the impact of debt overhang on private investment – is not proven, since it has not been tested specifically for concessional debt and theory suggests it may not apply to this case. For this reason we would be inclined to attach more weight to the flow, rather than stock, ratios.

203. The extent of downside risks would be best addressed by making debt contracts state-contingent; for instance, a country could be expected to make lower repayments in periods where commodity prices were low. This would require international reforms.

204. The scope for debt financing in Rwanda is therefore best discussed in the context of the macroeconomic model in section 7 and Annex 6. The most striking feature of the main model estimates is that is that the level of debt service/exports never rises above 20% even if the most expansionary scenario were financed entirely by loans. The annexes give five different forms of sensitivity analysis on these estimates, as they are of great importance. Less optimistic export or revenue projections make some difference; a more dramatic difference is made by assuming that the borrowing is on OPEC terms, where debt service/exports rises over 50% in the most expansionary scenario, or that HIPC relief is not forthcoming, where debt-service/exports rises over 30% in the most expansionary scenario.

205. Given that there is some level of borrowing that would be imprudent, the question arises how extra expenditures can be financed. One possibility is increased grants. In particular, increased availability of grants from IDA might compensate for diminished use of IDA credits. Secondly, more generous debt relief could be provided, allowing the country’s NPV/export ratio to fall below its long-run level. This would allow more borrowing in the transitional period. For instance, a total debt cancellation would allow
Rwanda to borrow about 30% of the value of exports (10% in present value terms) each year for the next fifteen years, in addition to the amounts allowed to keep the NPV ratio constant. This would provide substantial leeway to increase the funding of poverty-reducing expenditures. However, the HIPC initiative does not allow scope for adjusting the debt relief given to particular countries except on the basis of the agreed formulas.

206. One possibility here is to use future grants to reduce indebtedness further. However, given the concessional interest rates on debt, it would be more logical to save the funds and earn better interest rates with them. This possibility may run into the 'use it or lose it' constraint discussed above.

207. What is the implication of increasing the targeted NPV ratio to 250% as opposed to 150% of exports? This would allow borrowing to be higher by about 30% of the value of exports for the next ten years, in addition to a permanent increase in the level of borrowing by 300% of the value of export growth (100% in present value terms). At the moment, assuming 10% export growth, this would allow a total (permanent plus temporary) increase in borrowing of about 60% of exports, equivalent to about 5.7% of GDP in 2001. Over time, the temporary impact of the policy shift is removed, but the permanent increase rises as a fraction of GDP as the export/GDP share rises. This calculation assumes that additional concessional loans will continue to be forthcoming in the future.

208. On the other side of the ratio, it does make sense for the country to aim at reducing the NPV/exports ratio by increasing exports as fast as feasible, especially given the very closed nature of the Rwandan economy. The prospects for this are considered below.

4.4 THE FUTURE EXPENDITURE AND REVENUE IMPLICATIONS OF THE EXPENDITURE SCENARIOS

Deficits as measures of changes in net worth

209. The above discussion has shown that governments receiving concessional loans can finance primary (non-interest) deficits indefinitely. However, given the likelihood of quantity constraints on borrowing at some future date, the deficit does matter. Extra expenditures in the current period could raise macroeconomic concerns if they put enduring upwards pressures on public expenditure. In terms of the model in section 3, what this does is to introduce an intertemporal element in the form of C(Gt). The higher Gt is, the higher $C_{t+n}/\delta G_{t+n}$ will be in the future n periods ahead, for any given level of $G_{t+n}$, so that cuts in expenditure in future periods become more difficult to make because of the expenditure commitments incurred in the current period. At the same time, increased expenditures are likely to increase revenues in the future.

210. The proper definition of the deficit is the change in the government's net worth— the change in expected expenditures, minus the change in expected revenues. Easterly, in a series of papers65, has pointed out that standard deficit measures are defective measures of fiscal stance because they use excessively narrow conceptions of the government's net asset position.

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211. We are not able to quantify these effects exactly, but we have explored the future expenditure and revenue implications of the expenditures in the PRSP.

Effects on future expenditures
212. The ideal here would be to have a fully specified set of expenditure plans in the future. In some countries, something of the sort has been done. For instance, in the Botswana plan, ministries are given recurrent ceilings into the future and required to ensure that the recurrent implications of capital expenditures are included in the recurrent budget. Failing this: r coefficients, relating capital expenditures to recurrent costs, have been estimated internationally for some sectors.

Expenditure forecasting
213. The PRSP proposes two increased expenditure scenarios to address the priorities identified in the main text of the document. These have clear budgetary implications for the three-year period covered by the PRSP, always supposing that the proposed expenditures can be financed and disbursed. However, there are also likely to be implications beyond this time period.

214. The expenditures could be, in some sense, neutral i.e. they have no public expenditure implications beyond the year in which they are disbursed. Expenditures on demobilisation could come into this category. Once the programme has been implemented, there are no residual obligations and probably not any impact on reducing further public expenditure needs.

215. They could be expenditure augmenting. For example, expenditure programmes that require staff recruitment may be difficult to halt quickly. Expenditure programmes that invest in infrastructure, such as road rehabilitation should have ongoing maintenance requirements after the initial investment has been undertaken.

216. Finally expenditure programmes can actually be future expenditure reducing. Investing in preventive health care could significantly reduce the future requirements for drugs and acute medical interventions.

217. Annex 3 classifies the priority programmes into these categories. Table 4.1 shows a rough attempt to assign the proposed expenditure under the two scenarios into these different categories.

<table>
<thead>
<tr>
<th>TABLE 4.1 MEDIUM TERM EXPENDITURE IMPLICATIONS OF THE PRSP SCENARIOS</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Total additional expenditure</td>
</tr>
<tr>
<td>recurrent</td>
</tr>
<tr>
<td>development</td>
</tr>
<tr>
<td>Expenditure augmenting</td>
</tr>
<tr>
<td>Expenditure reducing</td>
</tr>
<tr>
<td>Expenditure neutral</td>
</tr>
</tbody>
</table>
218. Care has to be taken in the interpretation of the different categories. Sometimes, when expenditure-augmenting activities increase as between scenarios 2 and 3, this is simply a case of changing the timing of expenditures across a ten-year period. This is true for public works expenditures. The size of the medium-term expenditure commitments resulting from the initial expenditure is not necessarily linked to the size of the initial expenditure. In some cases, where new staff are taken on, the likely future expenditure is closely linked in amount to the initial expenditure, in others, such as rehabilitation programmes, the continuing cost of maintenance will be much smaller. For expenditure reducing activities, the size of future cost reduction could perhaps be crudely estimated on the basis of experience in other countries. Time has not allowed for that here.

219. Rehabilitation projects are particularly ambiguous to assign to these categories. The decision has been taken here to assign them to expenditure augmenting activities, to reflect additional maintenance costs necessary to safeguard the initial investment. However, it could be argued that if rehabilitation has to be done at some point, undertaking it in year 1 as opposed to year 5 actually reduces the overall cost of the rehabilitation. Similarly, the use of casual labour in a public works programme may make it easier to scale the programme down if resources are not available. However, the social impact of this could be highly damaging if labour markets remain slack and workers are dependent on their incomes from the public works programme.

220. The next stage is to quantify the magnitude of the expenditure impacts. We have not had time to do this in this study. There are two plausible methodologies; the use of international estimates of r-coefficients, which provide estimates of the recurrent costs of capital projects, and the development of a more systematic forward expenditure programme with various scenarios according to resource availability.

Effects on future revenues
221. The impact of expenditures on future revenue can be estimated in those cases where we have estimates of rates of return in terms of private income, by using the evidence discussed below on revenue buoyancy. Using an estimate of the elasticity or revenue with respect to GDP of 2 and a share of revenues in income of 10%, we get a marginal impact of incomes on revenue of 0.2. Thus, a project that has a 50% rate of return in terms of private income would raise a stream of revenue of about 10% of its value. This can be compared with values of recurrent costs.

4.5 PROSPECTS FOR RESOURCE FLOWS
222. The concern of this study is to examine the impact of the expansions in expenditure if the finances are available, rather than to assess whether they will be available in the current period. However, resource availability in the future periods may affect the prudent level of expenditure in the current period. Hence the study needs to assess the future level of resources to Rwanda.
Resource flows to Rwanda in the past

223. Table 4.2 shows aid flows to the Rwandan government over the last ten years.

### TABLE 4.2 EXTERNAL AID TO THE RWANDAN BUDGET, MILLION DOLLARS

<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>External aid</td>
<td>148.6</td>
<td>165</td>
<td>233.4</td>
<td>185</td>
<td>-2.98</td>
<td>174.7</td>
<td>137</td>
<td>187.3</td>
<td>175.7</td>
<td>202.1</td>
<td>222.5</td>
<td>218.4</td>
</tr>
<tr>
<td>% of total expenditure</td>
<td>28.0%</td>
<td>37.9%</td>
<td>46.8%</td>
<td>39.2%</td>
<td>-3.3%</td>
<td>64.8%</td>
<td>51.5%</td>
<td>46.7%</td>
<td>53.6%</td>
<td>65.8%</td>
<td>61.2%</td>
<td></td>
</tr>
<tr>
<td>% of GDP</td>
<td>5.7%</td>
<td>8.7%</td>
<td>11.6%</td>
<td>9.5%</td>
<td>-0.5%</td>
<td>13.6%</td>
<td>9.9%</td>
<td>10.0%</td>
<td>8.8%</td>
<td>10.5%</td>
<td>12.3%</td>
<td>12.8%</td>
</tr>
<tr>
<td>Grants</td>
<td>71.1</td>
<td>88.6</td>
<td>147.6</td>
<td>125.8</td>
<td>5.1</td>
<td>146.5</td>
<td>102.5</td>
<td>123.9</td>
<td>105.6</td>
<td>115.5</td>
<td>163.7</td>
<td>143.1</td>
</tr>
<tr>
<td>budgetary capital</td>
<td>22.2</td>
<td>35.3</td>
<td>69.1</td>
<td>38.6</td>
<td>0.0</td>
<td>45.8</td>
<td>0.3</td>
<td>7.9</td>
<td>11.1</td>
<td>44.8</td>
<td>101.6</td>
<td>76.5</td>
</tr>
<tr>
<td>Loans</td>
<td>48.9</td>
<td>53.3</td>
<td>78.5</td>
<td>87.2</td>
<td>5.1</td>
<td>100.7</td>
<td>102.2</td>
<td>116.1</td>
<td>94.5</td>
<td>70.7</td>
<td>62.1</td>
<td>66.6</td>
</tr>
<tr>
<td>budgetary projects</td>
<td>77.5</td>
<td>76.0</td>
<td>85.8</td>
<td>59.6</td>
<td>-8.1</td>
<td>28.2</td>
<td>34.6</td>
<td>63.3</td>
<td>70.2</td>
<td>86.6</td>
<td>58.7</td>
<td>75.3</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>531.2</td>
<td>434.8</td>
<td>498.3</td>
<td>473.1</td>
<td>89.5</td>
<td>269.8</td>
<td>298.9</td>
<td>363.5</td>
<td>376.0</td>
<td>377.2</td>
<td>338.0</td>
<td>356.8</td>
</tr>
<tr>
<td>% of GDP</td>
<td>20.5%</td>
<td>22.9%</td>
<td>24.7%</td>
<td>24.2%</td>
<td>16.0%</td>
<td>21.0%</td>
<td>21.5%</td>
<td>19.5%</td>
<td>18.9%</td>
<td>19.6%</td>
<td>18.7%</td>
<td>21.0%</td>
</tr>
</tbody>
</table>

224. It can be seen that external aid provided through the budget has fluctuated over time, but has been rising in the last three years. The proportion of grants and of budgetary support within both grants and loans increases dramatically over the period.

225. These flows have been disrupted by considerable within-year uncertainty. Reasons include donor concerns about Rwanda’s involvement in Congo, administrative problems and sometimes political developments within donor countries. These uncertainties have caused serious difficulties with budgetary management. Given that domestic borrowing outside the banking system is not yet well developed, shortfalls in aid present the government with a choice between stabilising public expenditure and stabilising prices. In Rwanda, the main response has been to adjust public expenditure rather than resorting to inflationary finance. In 2002, for instance, a delay in budget support from one major donor caused a severe shortfall in resources made available to local government, so that many officials were not receiving their salary.

### Prospects for resource flows internationally

226. Aggregate aid flows to Africa fell during the 1990s in per capita terms. In 1990, sub-Saharan Africa received $36 per capita of aid; this fell to $21 in 1998 (WDR 2000/1). However, Collier\(^{66}\) argues that this represents a one-off fall due to the end of the Cold War, rather than a steady decline.

227. The volatility of flows to particular countries is also debated. Collier finds that aid inflows actually fluctuate less than domestic revenue. Other authors, however, have found that they fluctuate more than domestic revenue and that commitments are very

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\(^{66}\) P.Collier,
The macroeconomic implications of increased public sector demand and different methods of financing

The macroeconomic implications of increased public sector demand and different methods of financing

poor predictors of disbursements. Lensinck and Morrissey find that the positive impact of aid on investment and growth is reduced by uncertainty about aid flows.

228. There has recently been considerable political interest expressed by a number of donor government in increasing aid to countries in Africa. Some governments have recently increased aid budgets significantly (including the British government). Whether this will translate into a sustained increase in aid flows to Africa remains to be seen.

Prospects for resource flows to Rwanda

229. More than one study has quoted extremely high figures for per capita aid to Rwanda, partly because figures for the mid-1990s are used (when aid surged and population fell) and partly because in some cases commitments rather than actual flows appear to have been used. The aid received by the Rwandan government is higher in per capita terms than that received by most African governments.

230. Rwanda’s prospects for increasing its allocation, relative to other African countries, are bolstered by a number of factors. First, the end of the war in Congo would remove one reason why some donors have been reluctant to commit funds. Secondly, Rwanda’s relative poverty and extensive policy reforms create the circumstances where aid is most likely to be effective. The effect of the shift of IDA support from loans to grants is ambiguous; it will tend to reduce the aggregate flows from IDA but might increase poorer countries’ share within the total, since grants could be allocated to poorer countries without running into constraints in terms of sustainability ratios. However, a permanent increase in resources cannot be taken for granted, since there are some other desperately poor and relatively well-managed countries that currently get less (for instance Ethiopia).

Institutional mechanisms for greater predictability in resource flow

231. Increased predictability of resource flows can be assisted by the agreement of long-term aid agreements between donors and recipients. Equally important, increased flexibility of resource flows is a necessary condition for implementing the PRSP agenda. In making expenditure commitments at this stage, the government needs to be sure that adequately flexible funds are available in the future. However, in this sphere prospects are relatively good. Many donors are interested in providing budget support, and even those who are less flexible have shown interest in tailoring some of their aid to support the PRSP programme; for instance, the use of American food aid to support public works programmes offers some prospects of integrating this support within the PRSP agenda (though the effects on food markets are of serious concern, as discussed below).

4.6 DEPENDENCY

232. The Rwandan government is committed to reducing its dependency on international aid. Dependency is often measured by the volume of aid flows relative to imports or public expenditure. However, the underlying concerns relate to downside risk

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67 A.Bulir, A.J.Hamann, How volatile and unpredictable are aid flows, and what are the policy implications? IMF working paper WP/01/167, 2001
69 See the studies by Elbadawi and Collier and Dollar referred to below.
70 See the discussion in chapter 5 below.
and control over the allocation of resources. Downside risk was discussed above, and needs to be explored in the context of a macroeconomic model.

233. The extent of control that government can exert over the shape of its expenditure programme is a fundamental issue. Section 5.2 discusses the process of moving from a set of planned expenditures to implementation, which is one of the issues. Another issue is the relation between politicians and technicians in the formulation of expenditure proposals, sectoral plans and budgets. Rwanda has a number of mechanisms that should help to ensure that the priorities in public expenditure reflect the government’s position, including the broad participatory process used in developing the PRSP and the requirement that the budget be submitted to parliament at the start of October, allowing time for Parliamentarians to have a substantive input. However, there are good reasons in Rwanda for the preparation of the budget to remain in the hands of MINECOFIN rather than a Parliamentary budget office on the American model, simply because of the scarcity of capacity.

234. The development of coherent sectoral programmes which guide budgetary allocation and give a clear guidance to donors is an essential part of exerting effective control over the whole process. Technical ministries also need to be equipped to oversee programmes even where there is a significant element of foreign involvement. For instance, the calculation of rates of return to allocate road projects raises socio-economic issues that are not merely technical; MINTRACO currently has no trained economists or other social scientists who could intermediate between this work and the political process.

235. Sovereignty can also be affected by side conditions imposed by donors beyond the allocation of resources. For instance, heavy pressure has been applied on the question of the Rwandan forces in Congo, which have now been withdrawn. Experience in the region, however, suggests that it is possible to persuade donors to accept different forms of democratisation and actions necessary to protect national security.

4.7 DUTCH DISEASE, EMPLOYMENT EFFECTS, OTHER DEMAND-SIDE EFFECTS

236. The main justification for public expenditure consists of supply-side effects. However, the expenditure also affects the volume and structure of demand in the economy. The change in demand can in turn affect the structure of relative prices and the volume and structure of output. The effects can be beneficial or harmful, depending on the particular case.

237. In most cases, increased public expenditure will increase total domestic demand. Theory suggests this is particularly true for temporary increases in public expenditure, for the following reason: as people foresee that over time the structure of demand will shift back towards private consumption, their permanent income and hence their consumption does not fall as much as public expenditure increases. It is also true for increases in public expenditure financed by grants or concessional loans if the grants are tied to the expenditure increases, because the grants and concessional loans increased the wealth of the economy. The one case where increased public expenditure might not increase
total demand is where the increase in public expenditure is permanent and is financed out of increased taxation either currently or in the future.\textsuperscript{71}

238. The consequence of this argument is that it likely to be prudent to programme an increase in domestic absorption and hence a widening of the current account deficit to coincide with the increases in public expenditure.

239. The increase in total absorption will tend to increase demand for output within the economy, unless the increased expenditure is entirely on imports. We therefore need to reckon with the possibility of demand-side effects on the economy. Monetary effects were discussed above: this section deals with real demand-side effects. These are of three major kinds: Dutch disease, increases in prices for government-purchased goods and services, and employment effects.

\textbf{The Dutch disease argument}

240. Dutch disease can be defined as a harmful increase in the relative price of non-traded goods and services caused by an expansion in domestic demand. This can be of concern for either distributional or growth reasons. The argument works as follows:

- Government spending pushes up total expenditure (absorption) in the economy.
- The effect on the economy is to increase demand for nontraded goods and services.
- Hence their prices rise, relative to the prices of other commodities in the economy.
- This increase may be bad for income distribution, if the poor are net sellers of traded commodities.
- The price increase causes the transfer of resources out of the production of exports and import-substitutes into the production of nontraded goods and services.
- The long-run growth impact is negative, because at the margin the production of exports is more beneficial for growth than the production of other commodities. (This assumption, although popular, requires some justification and should not be taken for granted).

\textbf{The real exchange rate in Rwanda}

241. Before investigating the Dutch disease hypothesis, we examine the real exchange rate in Rwanda to see what relative prices it corresponds to. As noted above, there are different price series used in Rwanda. The IMF estimates real exchange rates from movements in nominal exchange rates and in prices in the country and its trading partners. This is an internationally standard methodology, but can be interpreted in two different ways. For economies which mainly trade products that are imperfect substitutes for other countries' output, the REER measures the competitiveness of their output. For small economies selling output at given world prices, the REER measures the relative price of traded and nontraded goods\textsuperscript{72}, an appreciation implies that nontraded goods

\textsuperscript{71} The theoretical case where increased government borrowing does not increase absorption was made famous by Barro (ref).

\textsuperscript{72} In effect, traded goods capture the prices of imports and import-substitutes rather than the price of exports, which barely affect the Rwandan CPI. Thus movements in the REER need to be added to movements in the terms of trade and taxation of exports to capture overall changes in incentives for exporters.
have become relatively more expensive. The IMF use their own price index for Rwanda, based on the Central Bank price index, which covers only Kigali. However, the findings in section 4.1 suggest that the IMF price index may not be the best index for explaining money demand, and the index is restricted to Kigali, which is inappropriate for an index designed to capture the effect of relative prices on exporters. Hence we also use a series based directly on the official CPI. These two series are plotted in Figure 4.4

242. The REER series is defined here so that an increase represents a real appreciation. It can be seen that there has been a secular depreciation in Rwanda through the early 1980s, culminating in 1994 (for which the data are very limited). Then there is an increase in the REER through the period to 1998, followed by a renewed depreciation. The CPI series, but not the IMF series, is much depreciated compared to its level of the late 1990s.

243. To give the REER in Rwanda a concrete interpretation, it is useful to relate it to the relative price of food. Food in Rwanda is not entirely nontraded, but transport costs for relatively bulky crops such as potatoes suggest that its prices are likely to reflect domestic supply and demand rather than merely international prices. The trade-off between food crop and export production is a critical choice in the rural economy. We therefore attempt regressions of the real exchange rate on the relative price of food. Results are shown in Table 4.3. The IMF definition is much more closely related with the food price than the definition using the official CPI, with an elasticity close to 1 and the predicted sign (an increase in the relative price of food, which is non-traded, increases the real exchange rate proportionately). However, it is not clear how these results should be interpreted given the similarity in the rate movements in Figure 4.4.
TABLE 4.3 REGRESSIONS OF THE REAL EXCHANGE RATE ON THE RELATIVE PRICE OF FOOD

<table>
<thead>
<tr>
<th>Relative price of food</th>
<th>IMF definition</th>
<th>CPI definition</th>
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<td></td>
<td>.95</td>
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<td></td>
<td>(2.28)</td>
<td>(.04)</td>
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<td>DW</td>
<td>1.83</td>
<td>1.38</td>
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<tr>
<td>R2</td>
<td>.61</td>
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The link between domestic demand and the real exchange rate

The next question is what determines the real exchange rate. Annex 4 includes an attempt to estimate the real exchange rate in Rwanda using time-series data. The results do not support the Dutch disease hypothesis, but we think it would be inadvisable to put too much weight on this, since there may be technical reasons in the model for this. The substantive questions relate to the secular depreciation, and the temporary real appreciation of the late 1990s. The first of these may well relate to the liberalisation of the economy, as it is a theoretically predicted consequence of relaxed controls on imports that the real exchange rate will depreciate. The appreciation in the late 1990s may well reflect inflows of emergency support in the aftermath of the genocide. While these provide sensible working hypotheses, it is striking that the econometric estimates fail to pick these effects up. Another possibility is that the damage done to exports by nonprice factors has caused the decline. Also, the government of the 1980s and early 1990s often required farmers to grow coffee even if it was not profitable for them; this may have artificially supported the exchange rate. The relaxation of this form of control would then cause a real devaluation, and this type of controls is not captured by our measure of trade regime in the econometric estimates.

Given the difficulty of successful estimation of these effects on the basis of the Rwandan evidence, we turn to international evidence.

Elbadawi\textsuperscript{73} models the real exchange rate and nontraditional exports in developing countries, using a cross-country panel data set. He finds that both government consumption and ODA increase the real exchange rate, but with a very much higher elasticity for government consumption (.44) than for ODA (0.08). This implies that ODA worth 50% of GDP increases the real exchange rate by 5%. (There may be some double counting in these equations, since some ODA finances government consumption). The lower elasticity for ODA might reflect either the smaller magnitude of ODA than government consumption or the greater domestic content of government consumption than ODA.

Simulation models have also shed some light. Adam and Bevan\textsuperscript{74} provide a model of the Ugandan economy in which Dutch disease effects may be purely temporary, if the funds boost productivity in the nontraded sector. Similarly, Ghosh\textsuperscript{75} in a simulation model

\textsuperscript{73} I. Elbadawi, External aid: help or hindrance to export orientation in Africa? Journal of African economies, volume 8, no.4, 1999
\textsuperscript{74} C. Adam and D. Bevan, Aid Flows and Dutch Disease with an application to Uganda, mimeo., DFID
\textsuperscript{75} A. Ghosh, The fiscal policy response to aid and its macroeconomic effect: simulation results, mimeo, IMF (personally provided to the authors)
for a stylised low-income economy finds that Dutch-disease effects are important when government spending on nontraded goods increases, but not otherwise.

248. An important issue here, brought out by Adam and Bevan, is the time-period of the effects. Public expenditure should have temporary effects on domestic demand, but long-term effects on supply. This applies to expenditures on health, education, and agricultural extension as well as physical investment; all these services should provide lifelong benefits at least in some cases. For that reason, while an increase in public expenditure will increase the real exchange rate in the short run, it does not follow that an economy which has had higher public expenditure for a sustained period will therefore exhibit an appreciated exchange rate.

**The impact of real exchange rate appreciation**

249. We turn now to the next part of the Dutch disease argument, the claim that an appreciation of the exchange rate will affect income distribution, exports, investment and/or growth negatively.

250. The difficulty in assessing the impact on exports is that we are concerned here with an appreciation of the real exchange rate as an equilibrium response to foreign exchange inflows, rather than as a policy variable. As a result, the logical econometric approach is to model the response of the economy to the inflows that cause the real appreciation, and it is then difficult to isolate the Dutch disease effect from the other effects on growth, including supply-side effects. For this reason we postpone discussion of the aid-growth literature to section 5. However, Elbadawi’s study focuses specifically on non-traditional export growth, and is thus of particular relevance to the Dutch disease issue. He finds that aid increases nontraditional exports up to the point where it reaches 22% of GNP, before starting to reduce them. While Rwanda appears to be above this level in his data and he describes the country as one of those “experiencing ‘acute’ aid dependency”. However, as noted above, this appears to reflect the date and quality of the data. Also, if the supply-side benefits of public expenditure can be tilted towards exports this will naturally alter the results.

251. The Rwandan case is complex because the low level of exports reflects mainly non-price factors. Rwanda is heavily dependent on exports of tea and coffee. These have been secularly depressed for various reasons, including:

- An aging stock of coffee trees.
- The relaxation of controls that required farmers to grow coffee.
- Dilapidation and inadequate capacity in tea factors.
- Poor infrastructure for washing coffee.

252. The actions needed to upgrade the sector include appropriate privatisations and possibly some public support beyond what was envisaged in the PRSP.

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76 The literature on exchange rate misalignment, in contrast, is largely concerned with deviations of the exchange rate from its market-clearing level.

77 Elbadawi’s conclusion about Rwanda was used as evidence in one IMF memo to the government on Rwanda; this illustrates the risk of basing policy recommendations on cross-country academic papers that may not be using the most accurate or recent data for each country.
253. In Rwanda's case, one important consideration is that intercropping takes place, and there is a technical case for encouraging it (though it was previously discouraged). For instance, a study by the Food Security project suggests that the best way to grow coffee in Rwanda might be to intercrop with banana. As a result, there may be some complementarity between export crops and crops for the domestic market. Inputs purchased for one crop may benefit the other crop, and incomes raised for one crop may be spent on inputs for another crop, as has been observed for modern and traditional potatoes in Rwanda. And coffee trees growing under bananas are unlikely to be torn out when the price of bananas goes up.

254. The impact of real appreciation on investment depends partly on the extent to which investment opportunities exist in traded or non-traded sectors and partly on the composition of investment. Adam and Bevan find that in Uganda, investment is relatively intensive in non-traded goods and hence real appreciation tends to squeeze private investment; by contrast, Warner attributes the decline of real investment in Mexico to increases in the price of machinery due to real depreciation during economic crisis.

255. In Rwanda’s case, there is reason to think that real appreciation would actually be good for some forms of investment directly related to poverty. The PRSP placed great emphasis on increasing the use of inputs on crops produced either for export or for the domestic market. In the case of fertiliser, this is mostly a traded input and is used on food crops that appear to have their prices determined by the domestic market. In this case, a real appreciation would actually increase the returns to fertiliser and would thus encourage its uptake by farmers. Similarly, reductions in the price of fuel relative to food would tend to support the commercialisation of agriculture. While the poorest farmers will not be the first to benefit from this, the multiplier effects within the rural economy are central to the government’s poverty-reduction strategy. Admittedly, producers of export crops tend to lose from real appreciation; however, at the moment export crops are a relatively small share of the value generated in the agricultural sector (though a larger share of marketed output).

256. It may seem obvious that anything which discourages exports is bad for growth (as assumption which is made e.g. by Elbadawi when he describes the level of aid which maximises nontraditional exports as the ‘optimal’ level of aid). However, the real exchange rate, like any other price, adjusts to reflect demand and supply. Its appreciation is bad only if the price of exports already understates the full economic benefit of exports to the economy. Possible reasons for this include (a) the real exchange rate appreciation is temporary and misleads investors about long-run prospects (b) exports or imports are already taxed (c) exports generate more positive externalities than other forms of output (d) exports offered better opportunities for investment and hence promoted investment and savings in the economy (e) an increase in exports relaxes the quantitative constraint on concessional lending by the government (an artefact of the design of sustainability ratios).

78 J. Mellor, Rapid employment growth and poverty reduction: sectoral policies and implementation in Rwanda, mimeo., 2001
79 The absence of taxes on exports (except for some producers’ levies to support OCIR) is significant, but taxes on imports also tend to raise the relative price of non-tradeables and hence lead to anti-export bias in the price structure.
80 In strict neoclassical terms, this is not an inefficiency, but one can make a strong case that in these circumstances it would make sense to promote export production.
257. It is certainly the case that the measured share of exports is extremely low in Rwandan and that it would be very desirable to increase it. However, there does seem to be scope for introducing non-price actions to increase production at the same time as allowing some real appreciation from the effects of aid inflows.

258. Fiscal impacts of devaluation have been examined by Adam, Bevan and Chambas\textsuperscript{81}. They find that real depreciation worsens the yield from taxes on yield in sub-Saharan African countries. In addition, it would tend to increase the real cost of international debt service payments, which are denominated in foreign currency.

259. Finally, the impact on distribution is in principle ambiguous. Minot\textsuperscript{82} uses the mid-1980s survey in Rwanda to examine the impact of the 1990 devaluation. He assumes that most staple food crops are nontraded. The direct impact of devaluation on nutrition is found to be negative, but much stronger for urban than rural households, because rural households ‘are insulated from price changes by the importance of home production’. These results suggest that urban households would benefit more from real appreciation than rural households, but that both groups would benefit.

260. Overall, the Rwandan evidence does not suggest that Dutch disease effects on exports are likely to be serious enough to warrant the rejection of grants, provided that energetic actions are taken to reduce the non-price constraints on exports.

**Increases in prices for government output**

261. Increases in public expenditure will tend to increase the prices paid by government for its output. Unlike Dutch disease, there is a general theoretical reason why this is damaging. Taxation is generally distortionary, and therefore there is an assumption that at the margin income in the hands of government is more socially valuable than income in the hands of the average taxpayer. When the prices of goods and services purchased by government rise, this transfers income from government to its suppliers. Hence, except where the suppliers are poor, there is a presumption that government should act like a monopsonist and moderate its demand for goods and services to keep their prices down. In concrete terms, the prices involved include public sector wages and prices of construction. Most public sector workers are considerably better off than the average Rwandan, and so these effects tend to transfer income to the better-off; however, this would not be true for a well-designed labour-intensive public works programme.

262. If the price increase caused by government expansion were particularly sharp and temporary, it could reverse the presumption that loans are concessional, because the expected inflation rate on government’s own spending would become negative, increasing the real interest rate effectively paid on the borrowing.

263. The increase in prices may be exacerbated by some donor practices. For instance, many donor offices pay wages far above those in the public sector, leading to a leakage of staff from government offices and either reductions in the quality of the public service or upwards pressure on wages there. In the case of housing, it has been found that international agencies working through were pricing new houses at about $1,000, which


\textsuperscript{82}N.Minot, Distribution and nutritional impact of devaluation in Rwanda, Economic Development and Cultural change, vol.46 no.1, 1997
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is much more than a Rwandan household would usually spend on a house. The shift to government implementation appears to be cutting costs in this sector.

264. These effects are a special case of Dutch disease, but are not caught by CPI-based measures of the real exchange rate, because the price of government output may behave quite differently to the CPI (involving, for instance public sector wages). They have been little studied, may well be both large and serious. However, they will depend on the composition of public expenditures. In some cases, such as imports or locally produced textbooks, bulk buying may actually reduce unit costs.

**Employment effects**

265. Not all the demand-side effects of public expenditure are bad. There is an old tradition, going back to Keynes, that suggests increases in public expenditure reduce unemployment. For poverty-reduction in Rwanda, the critical issue is rural underemployment rather than formal urban employment. Some public expenditure will directly or indirectly increase employment opportunities for the rural poor, and this is a benign effect.

266. The nature of rural labour markets in developing countries is controversial and is a matter of interpretation; for instance, two major books on the Indian village of Palanpur, done by equally capable economists, come to very different views about the existence of unemployment or ‘surplus labour’83. The most extreme position is that labour is available with infinite elasticity of supply – i.e. that increased demand for labour causes no increase in the real wage. A more plausible position is that there is a positive elasticity of supply of labour, in this case an increase in demand for labour will increase GDP and will also tend to increase the wages of rural labourers; depending on the targeting of the work, this may be good for income distribution. (For instance, the wage should be set low enough to target poorer rural households).

267. It is worth distinguishing this form of unemployment from the textbook Keynesian case. Keynesian unemployment typically arises from price and/or wage rigidity in integrated and regulated labour markets. The unemployment we are discussing arises rather from the fragmented and seasonal informal labour markets characteristic of rural areas in low-income countries.

268. In Rwanda, households in the lower expenditure quintiles work shorter hours in paid employment than those in higher quintiles84. One way to interpret this is as evidence of rural unemployment in the sense that people would like to work longer hours if jobs were available. This analysis needs to be extended to reflect the time spent on domestic tasks, because many poor households are female-headed and may be very heavily burdened by domestic tasks (sometimes including the feeding of prisoners, see World Bank Poverty Note REF). Mellor85 has calculated employment effects assuming positive elasticities in Rwanda.

**Integrating demand-side considerations into the design of public expenditure**

83 See C.Bliss and N.Stern, Palanpur: the economics of an Indian village (1982), and the later study by Dreze, Lanjouw et al. on the same village
269. We have seen that the demand-side effects of public expenditure include both positive and negative aspects, and there is no definite presumption about which aspect dominates.

270. It would be useful to integrate these considerations into the design and management of public expenditure. The government is in part a monopsonist and should act as one, i.e. it should shape its expenditures in order to make their macroeconomic impact as beneficial as possible. One way of doing this is limiting the wage bill. This is also going to make sense from the point of view of sustainability as downside risk. The government is currently grappling with the challenge of civil service reform, and the shortage of highly skilled staff in technical positions. The concerns about Dutch disease, and the concerns about economic growth discussed below in Section 5, make a strong case for aiming to restrain the overall wage bill while addressing the relative structure of incentives.

271. For non-wage goods and services, improved monitoring of costs is needed. This is a substantial challenge in a context where unit costs have not, until very recently, been specified in sectoral budgets. The development of a simple information system where unit costs were regularly monitored would also have value for avoiding possible corruption in procurement (we have no evidence on how large this problem may be in Rwanda).

272. How sectoral policies can be made responsive to price changes is a major question. It seems likely that the public-sector cost effects would be reduced if ministries became more responsive to prices in their expenditure decisions. This can be achieved by improving the incentives for ministries to focus on outputs and outcomes, a fundamental aspect of the MTEF process. Some government-wide restrictions may be needed; for instance, if ministries were to compete with each other in offering increased wages, this would tend to exacerbate upwards pressure on salaries.

273. Demand-side effects also depend on the geographical allocation of expenditure. While it is difficult to model this formally, it may have important effects on the pattern of growth and linkages across different areas; expenditures in urban centres outside Kigali are likely to have significantly different linkages to those in Kigali (though one of the striking structural features of the Rwandan economy is the persistent poverty of rural Kigali, indicating that linkages have been limited).

274. The expenditure proposals in the PRSP do not, for the most part, take the form of increases in the public sector wage bill. They would imply increases in the employment of casual labour, but as noted above this raises less concern in terms of its distributional consequences. More seriously, they include a substantial amount of construction. Particularly for the expanded scenario, it would be extremely important to strengthen the government’s capacity to control construction costs.

4.8 ABSORPTIVE CAPACITY

275. Absorptive capacity is a slippery concept, because it often reflects hidden financial constraints on managerial inputs. It can take the following forms:
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- Weakness in project preparation, administration and strategic planning in ministries, possibly exacerbated by the complexity and/or diversity of donor procedures.
- Delays in donor approval of projects.
- Shortages of physical infrastructure to cope with physical inflows of resources (a problem in the early stages of humanitarian relief in Rwanda, but not so likely to be a problem for the PRSP).
- Excessive administrative burden on staff as the range of activities increases.
- Shortage of private sector contractors to carry out work, perhaps manifested in delays and rising fee rates.

276. Absorptive capacity constraints are likely to reduce the implementation rates of plans. This does not necessarily imply that plans should be reduced to anticipate them. If it is impossible to predict the projects that will run into absorptive capacity constraints, then it makes sense to include larger totals than it is actually anticipated will be implemented. Where this does cause a problem is in cases where many projects are started and very few get finished, so that they are unproductive. This has been observed extensively in India, and is a serious contributor to the inefficiency of public investment.

277. All of these constraints can be alleviated by increasing the financial resources available for projects, for instance hiring extra numbers of highly skilled administrative staff. However, this increases project costs and may also change the composition of expenditure in ways that are macroeconomically damaging.

278. Discussions with Rwanda suggest strongly that absorptive capacity is specific to forms of funding and sectors. In particular, there is no sign of an absorptive capacity constraint for budget support.

4.9 TAXATION

279. The case for increased expenditures is clearly strengthened if there is high revenue-raising capacity. However, it makes a difference whether taxes respond to policy or to GDP growth. If taxes are responsive to increased tax rates and this can be achieved without economic distortion, then there is a case for financing some of the increased expenditures by raising rates of taxation. If, on the other hand, taxes are strongly responsive to GDP growth, this provides some support for increased aid flows now, on the grounds that the country’s ability to finance higher expenditure will increase in response to the GDP growth generated by increased expenditures.

280. Taxation policy has been studied both by the IMF, who have provided technical support to MINECOFIN, and by a recent report on the real sector supported by DFID.

International evidence on tax rates

281. The DFID report cites an international study on the response of GDP to tax rates and tax base, with the following equation estimated over 34 countries with a single tax rate:

VAT Revenue/GDP = -1.746 + 0.503*VAT Rate + 1.313*VAT Base
\(R^2=0.37\)

282. It is striking here that the increase in VAT/GDP is estimated at just half the value of the VAT rate. This seems likely to reflect substitution effects. Rwanda’s small size and land borders make it very difficult to prevent smuggling, suggesting that the substitution effects will be particularly strong. Customs have come up with imaginative schemes to limit these effects, for instance by country-specific tops on beer bottles.

283. Annex 5 gives the results of estimations of tax elasticities in Rwanda. Our findings suggest significantly higher elasticities than have been found in other studies; we get an estimate of 3.3. While this seems excessive, an estimate of 1.5 would seem reasonable given that growth in Rwanda will be associated with structural change – indeed growth probably cannot happen, in this context, without structural change.

**The scope for increasing tax rates**

284. What would the efficiency and distribution impacts of higher rates of tax be? For the case of VAT, if the tax is well administered, the only effect on incentives should be the quite general effects on the trade-off between market-oriented and domestic activities, including subsistence agriculture and leisure. Studies elsewhere in Africa\(^{87}\) show that the distributional impact of VAT is mildly pro-poor. It would be possible to improve the distributional impact by taxing luxuries at a higher rate, and this would appear to have considerable social justification given the very high degree of consumption inequality found in the EICV.

285. Difficulties in administration, however, may be very serious. VAT and duty-drawback systems have excellent incentive properties in principle, but become highly distortionary if businesses have difficulty reclaiming their expenses. Private sector representatives in Rwanda have repeatedly emphasised that these systems are problematic in Rwanda (raised in the DFID report, and confirmed during our consultations). It is therefore possible that the prospects for the private sector might be better with higher rates of taxation but quicker processing of drawbacks\(^{88}\). This point was endorsed by at least one participant in the workshop with the private sector, although other participants were worried about the effect of (even non-distortionary) taxes on disposable income and hence on demand. In this context, it should be remembered that public expenditure financed out of taxation will add to domestic demand even while the taxation itself reduces domestic demand.

286. One area of particular relevance to the present study is the effects of the taxation system on inflows of resources.

**Policy implications**

287. What the above discussion suggests is that there is considerable scope for increased revenues out of economic growth. There may also be scope for increasing revenues by increasing tax rates, though smuggling effects could be powerful. Attempts to increase the tax take through improved administration are more doubtful; improved

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\(^{87}\) See the papers in D.Sahn, Economic reform and poverty reduction in Africa (1997)

\(^{88}\) Recent reports indicate that duty drawbacks to fictitious companies in Uganda have been a major problem, so quicker processing would have to be combined with a sound system of verification.
administration in Rwanda should increase rebates as well as tax payments, and should not therefore be relied on to increase the resource envelope.

4.10 EXPORT PROSPECTS

288. Clearly, the vulnerability of the economy to a fall in external resources depends not only on the level of revenues but also the level of exports. A lower level of exports implies that the exchange rate adjustment needed to restore balance of payment equilibrium in the event of a shortfall in funding will be more severe. Hence realistic export projections are important for macroeconomic management, even though the focus on the stock ratios of NPV of debt to exports is misguided.

289. Rwanda has a low measured share of exports in GDP, though there is significant informal cross-border trade that is not picked up in the national accounts. Exports for 2001 are inflated by the boom in coltan, which appears likely to be temporary. Some observers feel that existing projections of exports are highly optimistic given observed in other countries, though the low export base should perversely make it easier to achieve higher proportional rates of growth in exports. The removal of nonprice constraints is central to achieving increases in exports. Sector by sector, critical actions are:

- Privatisation of tea factories, with incentive structures that encourage factories to buy tea from surrounding smallholders and make tea an attractive crop for he smallholders.
- Encouragement of private investment in coffee washing stations, with an increased attention to the quality of coffee.
- Extensive investment in new coffee trees in those parts of the country where coffee is potentially profitable.
- Support to extension and fertiliser distribution for potato farmers. As noted below in Chapter 6, one estimate indicates that with appropriate increases in quality and marketing, potato exports could reach as much as $17 million by 2020.
- Better marketing of Rwanda as a tourist destination.
- Restoration of the previously strong re-exports from Rwanda by a bonded warehouse or functioning duty drawback system.

290. How large are realistic growth rates for exports? On the Frontier has provided a strategy for the expansion of coffee, based on improving quality and disseminating seedlings of productive varieties. They suggest that Rwanda could increase green coffee tonnage to 60,00 tonnes in 2010, more than tripling the current levels of 19,000 tonnes in2001, with export earnings from coffee rising almost sixfold to $117 million, largely because of the improvement in quality and hence price received. In comparison, volumes in the early 1990s were between 28 and 38 million tonnes89; since then, labour has become more scarce, trees have aged and coffee has become less economically attractive at existing productivity levels. This strategy will require some public support, although the exact apportionment of activities between public and private sectors is unclear. The introduction of improved varieties is an essential component because the existing low-productivity varieties offer poor returns to farmers. There is likely to be some public support to private investors, and perhaps some moral suasion on the commercial banks.

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89 Data cited in Loveridge et al. show even steeper declines in production.
291. The question that arises is the realism of this kind of projection. It is probably best to see them as the upper limit of what is technically feasible, with optimal implementation and sustained investor confidence. More work is needed examining comparable experiences in similar countries. It should be underlined that the spirit of the approach is similar and potentially complementary to the strategy for increasing agricultural productivity developed in the PRSP, with smallholder production supported by appropriate public goods and better information and distribution of inputs. Complementarities arise in the fact that improved transport would serve producers of exports and producers for the domestic market, and from the potential for intercropping coffee with other crops such as bananas. The institutional separation between the export crop agencies and the Ministry of Agriculture has in the past impeded the full realisation of the potential synergies.

292. The conclusion of this discussion, so far as the realism of export projections goes, is very tentative. However, the discussion does strongly suggest that the progress of exports in Rwanda will be a function of the priority policy gives to them. The idea of sector-specific strategies, with well-defined public and private sector roles and energetic public action in those roles assigned to the public sector, seems to be the right way to go. Strengthening this component of the sectoral strategies has significant returns in terms of the sustainability of the whole programme and the amounts of concessional lending that can prudently be taken on.

4.11 CURRENT ACCOUNT DEFICITS

293. Increased aid inflows are likely to lead to increased current account deficits. The government's initial projections for the PRGF attempted to reconcile increased aid inflows with a conservative current account deficit, but the IMF pointed out, rightly, that this implies a squeeze on private consumption or investment. In practice, it is much more likely that the increase in the deficit will be at least as large as the increase in aid flows.

294. There is a serious possibility that the increase in the current account deficit could be larger than the increase in aid flows, since the increase in public expenditure is likely to generate multiplier effects, increasing private investment and consumption. The question then arises whether the country will have trouble financing its balance-of-payments gap, in addition to its financing need to cover the fiscal gap. This need not be a problem, if the real exchange rate is allowed to be flexible. However, the resulting real depreciation will (in order to preserve the identities) tend to reduce domestic consumption (unless private economic activity expands). For instance, it could lead to a squeeze on civil service salaries in real terms. The simulation results of annex 6 are encouraging; even where the marginal propensity to consume is set at unity, the residual 'other flows' in the balance of payments does not explode relative to GDP.

295. Some economists refer to current account deficits as 'disequilibria', with the strong implication that deficits ought to be reduced over time. This terminology is rather misleading. The term disequilibrium has at least three accepted and recognised uses in economics. First, it refers to a situation in which prices fail to clear markets, demand and supply are not equalised. Secondly, it refers to a situation in which all agents are acting optimally given the actions of other agents. Thirdly, it refers to a situation in which some

variable in the economy is stable over time. A current account deficit does not necessarily imply a disequilibrium in any of these three senses. Evidence on the growth impact of current account deficits is considered in section 5 below, since it reflects both demand- and supply-side effects.
5 The benefits of increased public provision of goods and services: macroeconomic factors, policy and poverty reduction

5.1 INTRODUCTION

296. The previous section discussed the demand-side effects of extra expenditure and its financing on demand. Not all of these effects are bad. However, the main purpose of public expenditure is its supply-side benefits. If increases in government expenditure were not to improve poverty indicators, either directly or indirectly, there would be no reason to undertake the possible additional risks associated with either increasing taxation, increasing aid inflows, or indebtedness. In order to address this, this section addresses four questions:

- Would increased expenditures in fact be used to finance the PRSP priorities?
- Is there good macroeconomic reason to think that increased public expenditures can promote growth and poverty reduction?
- What are the critical policy requirements for the expenditures to produce these benefits?
- What macro considerations are there about the phasing of increased expenditures?

297. Section 6 then examines the specific merits of the PRSP expenditure proposals sector by sector.

5.2 FUNGIBILITY, TRANSPARENCY AND ACCOUNTABILITY

298. Where an inflow of funds for a particular purpose may lead to other resources, which would have gone to this purpose, being diverted to other purposes, the flow is said to be ‘fungible’. Where other agencies can see what a particular agency is doing with its resources, the agency is said to be ‘transparent’. Where an agency has to answer to other for its actions, it is said to be ‘accountable’. All of these issues, which are strongly interlinked, raise some issues in Rwanda.

Will extra resources go on the purposes of the PRSP scenarios? Commitment and fungibility

299. ‘Fungibility’ refers to the case where extra money is spent on the intended purposes, but some of this spending would have occurred anyway. This is a general question about aid, but is probably less important in the case of the PRSP scenarios in Rwanda, because they are calculated on the basis of a baseline that comes from the already existing MTEF. If the extra resources are not forthcoming, the existing MTEF will be implemented without the proposed extra activities. There was an implicit judgement in the PRSP that the needed reallocations could best be achieved through expansion rather than reallocation within the existing budget. This is inevitably both a technical and a political judgement.
The benefits of increased public provision of goods and services: macroeconomic factors, policy and poverty reduction

300. The use of extra resources directly to finance purposes outside the PRSP scenarios raises more concerns. There are at least five possible cases:

- Extra resources may finance activities within the PRSP, but at greater cost than envisaged in the PRSP scenarios.
- Extra resources may finance other poverty-related activities not envisaged in the PRSP.
- Extra resources may finance additional administrative activity not included in the PRSP scenarios.
- Extra resources finance increases in wages.
- Extra resources may finance increases in military expenditures.

301. The possibility that the costs of PRSP activities will be greater than envisaged in the PRSP may arise for a number of reasons, including price rises in the economy, unforeseen costs, and donor modalities. The costings in the PRSP were developed by ministries themselves, using their best estimates of unit costs and optimal input mix. If donors impose further constraints on the input mix, this is likely to add to the overall cost. For instance, donors may prefer to give part of their aid in the form of technical assistance or food aid; indeed, in some cases different inputs come from different budgets, so that the donor has no mechanism to achieve the optimal mix of different inputs. Even when the input is optimal, its price may not be minimised because of tying of aid. This is a significant risk inherent in the expansion of expenditure, and it is the responsibility of donors at least as much as of government to minimise the impact. One possible approach is to ask donors to be flexible either about the form of input or about the sector in which their aid is provided; in this case a donor committed to providing technical assistance can be steered towards a particular sector.

302. If extra resources finance other directly poverty-related activities not envisaged in the PRSP scenarios, the appropriate response will be to revisit the scenarios to ensure either that some other expenditure is cut or that the overall resource need is revised upwards. The scenarios then serve, not as a straitjacket, but as a guide to the best exiting priorities as identified in late 2001. The discussion in section 6 identifies a number of areas where revisions of this kind may be needed; moreover, the sectoral strategies that are to be developed will provide an improved guide to expenditures in each sector. What is important is that the scenarios, and the sectoral strategies, are taken seriously as a guide to the use of extra resources, so that new expenditures are not undertaken without consideration of the overall implications for the shape of the programme as a whole.

303. The third possibility, that increased expenditures will finance increased amounts of administrative activity, is also a serious potential risk. The government is concerned about shortages of capacity and materials in the central and local administrations, and donors have a long track record of providing technical assistance and support to expansions in the administration. This applies to various parastatals and donor-supported units within government, including MINECOFIN itself; while each of these units may be well-conceived, there is a serious concern about how they can be fitted into a coherent fiscal framework. The use of extra resources to finance the PRSP scenarios will require tight discipline, on both government and donor sides, in any expansions of total resource expenditures on administration. This can only be achieved if the administration itself is planned subject to a tight resource constraint.
Fourthly, the possibility that extra resources will fund increases in wages is also a significant risk. It is possible for sectoral ministries to make commitments that the ministry of finance has great difficulty not honouring, such as a recent mass promotion of military personnel, which was undertaken without any apparent consideration of the fiscal implications. One reaction to this risk is to restrict the share of the wage bill in GDP. While this is in principle a good idea, it runs into the problem that costs can also be inflated by remuneration paid outside the formal wage bill, for instance on contracts issued by donors. There is no macroeconomic benefit, and some allocative damage, if a ceiling on the wage bill produces a proliferation of donor-financed positions paid outside the public sector wage structure. The measure that actually needs to be monitored is total public sector expenditure on remuneration for Rwandan personnel, including salary expenditures on donor-managed projects (many of which appear on the development rather than the recurrent budget). While some of these posts are temporary and can therefore be phased out over time, their resource cost and labour market implications may be worse than normal wage expenditures. There is also a good deal to be said for monitoring the total expenditures on T/A; the PRSP scenarios include little expansion in this area, and although its implications for local labour markets are obviously smaller than contracts for Rwandan staff, its resource implications are often much larger.

Finally, there is the question of military expenditure. Given the conduct of a successful campaign in a country many times its own size, Rwanda’s budgeted military expenditure has been remarkably small in recent years. Given the recent total withdrawal of Rwandan troops from Congo, the controversy about the objective of military expenditure should be reduced. Where fungibility might be a serious concern is that reductions in military expenditures may not be achieved if fiscal pressures on government are relaxed by increased donor inflows.

Table 5.1 shows recent trends in the wage bill, social and exceptional spending as proportions of GDP. It can be seen that the wage bill has not increased as a proportion of GDP since 1999 and that defence has been falling between 1999 and 2001, though it increases in 2002 (when it includes spending on the demobilisation). Social and exceptional expenditures have in the meantime significantly increased. These trend amount to a significant reallocation that is evidence of the seriousness of the government’s anti-poverty strategy.

<table>
<thead>
<tr>
<th>TABLE 5.1 SECTORAL ALLOCATION OF RECURRENT PUBLIC EXPENDITURE, AS % OF GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
</tr>
<tr>
<td>Current expenditure</td>
</tr>
<tr>
<td>O/w wage bill</td>
</tr>
<tr>
<td>Goods and services</td>
</tr>
<tr>
<td>Defence/security</td>
</tr>
<tr>
<td>Social (priority)</td>
</tr>
<tr>
<td>Exceptional</td>
</tr>
</tbody>
</table>

Transparency

Outside this framework, the allegation that most worries donors is that off-budget resources are being raised from operations in Congo. In general, a harsher view has been taken by...
donors of the use of such funds by government (the main allegation in Rwanda) than by corrupt individuals (the main allegation in Uganda). It is not possible, in this study, to examine the claim that resources have been raised and spent by Rwandan forces in Congo. It is, however, worth observing that the allegation of resource-extraction needs to be addressed within a broader context of conflict-resolution and human rights in Congo.

308. A further allegation that has been made on occasion is that the government was diverting fiscal resources raised in Rwanda into military expenditure in Congo. The reconciliation of fiscal and monetary accounts has been important for resolving this issue. And the Government has committed itself to further stocktaking of all accounts and incorporating them into the budget to avoid repetition of the discrepancies between accounts.

309. Outside the military area, international evidence suggests that corruption can arise in some areas of service delivery, especially if the transfer of funds through the system is not made public knowledge\(^91\), and in construction projects. Transparency will therefore be central to the successful implementation of the proposed PRSP scenarios.

Accountability
310. The aim of accountability should be to ensure that government is accountable to the Rwandan people. Where possible, donor processes should support this objective rather than adding additional elements of external accountability. Accountability to the Rwandan people is ensured through Parliament, which is authorised to control the actions of government. Some measures have been taken to enhance accountability, including the establishment of the Auditor general’s office and in the near future making the auditors’ reports public.

5.3 MACROECONOMIC AND MULTI-SECTORAL EVIDENCE ON PUBLIC EXPENDITURE AND GROWTH

311. Section 4 considered the demand-side, fiscal and monetary impacts of increased expenditures. We now consider supply-side effects, which constitute the main reason for increases in expenditure. The effects of public expenditure and aid on poverty can be modelled either at the macroeconomic or microeconomic level. There are a number of relevant bodies of evidence. First, there is a body of work which examines the link between growth and poverty: secondly, a literature on the links between aid (or public expenditures) and growth (and sometimes poverty): and thirdly, a literature on the determinants and importance of private investment. In each case, supply-side effects are hard to disentangle from demand-side ones, so the literature is focusing mainly on the overall effects of aid, not the supply-side effects in isolation.

The link between growth and poverty-reduction
312. There is no dispute that economic growth is needed for poverty-reduction. In the very long run high rates of economic growth are probably sufficient to end absolute poverty – for instance, very few people in Europe or America have expenditures below the Rwandan poverty line. However, the sectoral pattern of economic growth does matter for the speed of poverty reduction. For instance, a number of papers by Martin Ravallion\(^92\) have shown that poverty reduction in India has responded to specifically rural

\(^92\)
rather than urban economic growth. Poverty reduction operates both through increased 
aricultural production and through the linkages to non-agricultural incomes. This is likely 
to be even more true in Rwanda, given the very wide urban-rural gap and the high 
portion of people living in rural areas. The strong agricultural focus of the expenditures 
cluded in the PRSP represents a deliberate response to this evidence.

**Aid, public expenditure and growth**

313. The large literature on the effectiveness of aid is surveyed in a recent paper by 
Hansen and Tarp\(^93\). This finds that there is quite a robust positive relation between aid 
and growth. However, many authors find either that the effectiveness of aid diminishes as 
aid levels increase, or that aid effectiveness is dependent on the policy context.

314. Collier and Dollar\(^94\) have used the findings of Burnside and Dollar\(^95\) to estimate an 
efficient international aid allocation from the perspective of reducing poverty. Aid should 
general be targeted at poor countries with good policies. In this paper, the allocation of 
aid to Rwanda would actually fall. However, this depends on estimates of aid from OECD 
data in 1996 that were bloated by emergency aid and population movement, and on 
Rwanda’s economic policy being graded ‘poor’ on an index of economic policy 
constructed by the World Bank; while we do not have the updated index of economic 
policy in Rwanda, it must have improved significantly since 1996.

315. The application of the regression results to Rwanda’s case raises two further 
points. First, later work by Collier and Hoeffler\(^96\) finds that aid is more productive, and can 
be absorbed at higher levels, in post-conflict societies, and that the optimal period is 
between the fourth and seventh year of peace, when the country has had time to create 
the institutions capable of handing aid inflows. Secondly, the expenditure scenarios 
presented in the PRSP are meant to be improvements on the previously observed 
pattern of aid. Ignoring these two factors, aid is found to be productive at the margin in 
most countries up to levels of about 20% of GDP, suggesting that the most expanded 
scenario would take aid beyond the level at which it ceases to be marginally productive. 
However, the relatively good policy context, the post-conflict situation and the design of 
the PRSP scenarios should address these concerns.

316. Related work has been done on the effects of deficits by researchers at the IMF\(^97\). 
Using a sample of low-income countries, mostly highly dependent on concessional 
funding, the authors find that deficits have significant negative impacts on growth. 
However, the deficit is defined in such a way that grants are treated as revenue. Hence 
the finding is discouraging only for the use of concessional loans rather than grants. 
Within funding above the line, grants appear to be more productive than revenues. On 
the expenditure side, capital and non-wage expenditures boost growth, whereas wages 
reduce it. While the presence of a deficit reduces growth, external financing reduces it

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\(^{93}\) H.Hansen and F.Tarp, Aid effectiveness disputed, in Foreign aid and economic development, ed. 
F.Tarp, Routledge, 2000

\(^{94}\) Paul Collier and David Dollar, ‘Can the world cut poverty in half? how policy reform and effective aid 
can meet the International Development Goals’, World Development vol. 29, no.11, pp.1787-1802 
(2001), also World Bank Policy and Research Working Paper

\(^{95}\) C.Burnside and D.Dollar, Aid, policies and growth, American Economic Review (2000) 847-68

\(^{96}\) Paul Collier and A.Hoeffler, Aid policy and growth in post-conflict societies: Policy research Working 
Paper no. 2902

\(^{97}\) S.Gupta, B.Clements, E.Baldacci, and C.Mulas-Granados, Expenditure composition, fiscal 
adjustment, and growth in low-income countries, IMW Working paper 02/77, 2002
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less than domestic financing. Work by Gemmell et al. confirms that aid tends to fund public investment.

317. The finding that wage expenditures are relatively unproductive is important, and may reflect a number of factors. Wages might reduce growth because money is going into wages rather than employment, or because of Dutch-disease effects reducing incentives for private sector growth. There is no evidence at this macro level that increased public sector wages produce increased public sector productivity. While traditional aid has not financed wage increases, the increased availability of budget support could lead to wage increases if specific decisions are not taken to avoid this. The macroeconomic evidence tends to suggest that wage increases are not likely to be a productive use of aid. In this context it is important to note that the PRSP scenarios include no increases in wage levels and relatively modest increases in employment levels; most of the costs are nonwage. (One caveat is that primary school teachers usually account for a high proportion of wage costs. The productivity impact of primary education comes relatively slowly, and may therefore not be picked up in the econometrics unless a specific attempt is made to allow for a different lag structure according to the sectoral composition of expenditure – which no researcher seems to have done, and would be econometrically difficult).

Growth, poverty reduction and investment

318. It may seem obvious that private investment is important for GDP growth. However, some African countries have been able to grow for sustained periods with low rates of measured investment, and some authors have argued that no relation can be found between growth rates and investment in Africa. The main reason for this may be that measured investment does not capture the most important sources of growth in rural economies.

319. Consider, for instance, investments by smallholders in livestock, fertiliser, new seeds, product diversification, planting coffee trees, cleaning up decayed coffee plantations. All of these are investment in the sense of being changes in economic arrangements that tend to increase output, but only livestock investment is likely to be caught in national accounts as investment. So it is safest to assume that agricultural growth will depend primarily on public agricultural expenditures rather than private investment as formally measured (though investment by traders or in agro-processing may be more important than measured investment in agriculture itself).

320. This suggests that the relation between growth and investment should be sector-specific. Tourism and manufacturing, for instance, are heavily dependent on formal-sector investment.

321. If, in addition, it can be shown that agricultural and rural informal growth is the most important form of growth for poverty-reduction, then it maybe possible to argue that increased aggregate private investment rates, though desirable, are less critical for poverty reduction than much macroeconomic analysis suggests. However, there are some investments by the formal sector which will be critical for agricultural growth because of their very close linkages with smallholder agriculture, such as tea factories.

K.Gomanee, S.Girma and O.Morrissey, Aid and growth in sub-Saharan Africa: accounting for transition mechanisms, CREDIT research paper 02/05, University of Nottingham, 2002

See S.Devarajan, W.Easterly et al., Is investment in Africa too high or too low?
coffee washing stations, and transporters, or because of their effects on employment, such as some high-intensity agricultural enterprises.

**Determinants of private investment**

322. Analysis of the determinants and importance of investment is discussed further below.

323. Advocates of debt relief, including the IMF and some of its critics, have placed great weight on the impact of debt overhangs on private investment. However, other studies of investment have found that growth in GDP and the availability of private infrastructure are also critical determinants. In Rwanda’s case, it is valuable to distinguish three categories of private investors:

- Smallholders and small rural and urban entrepreneurs. As noted, much of the investment by this group is fundamental for poverty-reduction but may not be fully captured in the national accounts. The security of property rights has been found to be critical for investment, and this view has been very strongly confirmed by discussions with government and civil society. (In some cases household may invest in order to establish property rights). Price incentives will also be important.

- The formal private sector in Rwanda. Discussions indicate that domestic rather than external public indebtedness is an issue, because it directly affects the operations of private businesses. In the meeting the team held with the private sector, no participant mentioned public indebtedness as a constraint on investment even though the issue was specifically raised by the team members.

- Potential international investors.

324. To the extent that government finances its growth by domestic borrowing, this may tend to crowd out lending to the private sector. This is good news for inflation but bad for economic growth. However, this will depend on the extent to which lending to the private sector is constrained by the availability of funds as opposed to the availability of bankable projects. One way of getting at this is to examine the balance sheets of the financial institutions.

**5.4 THE POLICY ENVIRONMENT**

325. In the case of Rwanda, the policy environment is particularly crucial for economic growth, because the high population densities require agricultural transformation rather than extensive growth. Critical areas for the success of the strategy include:

- Property rights and land policy.
- Trade policy (openness is critical).
- Tea and coffee sector strategy.
- Contract enforcement and domestic legal system.
- Political stability and inclusive attitude to opposition.
- A successful resolution of the backlog in the legal system through *gacaca*; success depends on this process being generally perceived as fair.
- Decentralisation.

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100 S.Nickell, The economic theory of investment
- Sectoral strategies consistent with strategy.
- Flexible donor modalities to support the implementation of the strategy.

326. In general, Rwanda has embarked on a very widespread economic reform, and policy in most areas now provides a framework for pro-poor growth. Areas of possible policy risk include delay in establishing clear land rights, an insufficiently clear commitment to international trade in food crops, establishment of villages in the wrong places, and inadequate support to extension and input distribution in the agricultural sector. Because the Rwandan situation remains fragile and the effects of policies are highly interlinked, a single major policy error could prove very costly. For instance, even temporary adoption of trade restrictions on agriculture could send a negative signal about prospects for trade within the region; this would seriously undermine the whole approach to increasing the incomes of poor households.

5.5 THE TIME-PATH OF INCREASED EXPENDITURES: MACROECONOMIC CONSIDERATIONS

327. As noted above, the PRSP makes a case for a temporary increase in expenditures, based on the following arguments:

- There are various post-conflict needs to be resolved.
- There is an AIDS epidemic which needs urgent attention.
- The decline in soil fertility and other environmental problems urgently need to be arrested.
- There is temporarily high unemployment because of the low demand for nonagricultural goods and services.
- There is a need for recapitalisation in the rural economy.

328. This case appears to be sound, and receives further support from the work cited above by Collier and Hoeffler on post-conflict economies. However, administrative capacity and the risk of price spikes in public services might give grounds for a smoother increase in public expenditure. One approach is to relax the financial constraint but tightly monitor administrative capacity and prices in the public sector, to ensure that spending is delayed if it cannot yet be undertaken efficiently. This would be desirable but poses a significant technical challenge.
6 The poverty impact of the sectoral outputs financed by the increased expenditures

329. In the time available to the study, it is impossible to undertake a full-scale analysis of overall government expenditure plans. However, there are a number of activities identified within the PRSP as priority activities. These have been taken as the areas which the government sees as key to achieving its poverty reduction objectives. The study aims to examine how these activities may contribute to the objectives, any important implementation aspects which will affect impact, if possible, if these have been reasonably costed for inclusion in the PRSP budget, and whether there may be other activities arising in the foreseeable future which ought to be included in priority expenditure.

330. As indicated in Chapter 3 above, our assessment depends on a combination of past experience and studies in Rwanda, particularly where increased expenditure is based on expansion of existing programmes, inference based on need as indicated by the various poverty surveys and studies that have been undertaken, and international evidence and analysis of the specific issues being addressed in Rwanda.

6.1 IDENTIFYING THE MAJOR ELEMENTS OF THE INCREASED PUBLIC EXPENDITURE ENVISAGED UNDER PRSP

331. The PRSP is translated into three different expenditure scenarios, reflecting different assumptions about the availability of resources. As indicated earlier, the decision was made to focus on those activities identified within the PRSP as priority activities. They are as follows:

- Intensifying small-scale agriculture and livestock, including extension, credit, and support to marketing.
- Labour-intensive public works, including environmental infrastructure (agro-forestry, marshes, terracing and water management) and rural roads.
- Malaria and HIV/AIDS prevention, and support to health mutuelles and animateurs.
- Primary school textbooks.
- Economic infrastructure, including rural road maintenance and rehabilitation and rural electrification (microcentrales/grid extension/solar energy).
- Skills development for youth, women and small-business start-up schemes.
- Adult literacy.
- Gacaca.
- Demobilisation and reintegration into socio-economic activities.
- Shelter provision for the homeless, development of low-cost housing and imidugudu infrastructure.
- Development of sector strategies.
TABLE 6.1  2002 EXPENDITURE ALLOCATION TO PRIORITY ACTIVITIES, AND OTHER ACTIVITIES OF IMPORTANCE (FRW MILL)

<table>
<thead>
<tr>
<th>Priority Activity</th>
<th>Recurrent, Central Baseline</th>
<th>Recurrent, Provincial Baseline</th>
<th>Development Baseline</th>
<th>Recurrent, Central Additional, Scenario 3</th>
<th>Recurrent, Provincial Additional, Scenario 3</th>
<th>Development Additional, Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intensifying small-scale agricultural and livestock</td>
<td>1610.7</td>
<td>159.98</td>
<td>6056.2</td>
<td>1000</td>
<td>500</td>
<td>5464.4</td>
</tr>
<tr>
<td>2. Labour intensive public works</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4200</td>
</tr>
<tr>
<td>3. Malaria and HIV/AIDS</td>
<td>380.37</td>
<td>50.88</td>
<td>444.71</td>
<td>1700</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. Primary textbooks</td>
<td>1256.58</td>
<td>0</td>
<td>576</td>
<td>7000</td>
<td>3000</td>
<td>116</td>
</tr>
<tr>
<td>5. Economic infrastructure</td>
<td>2112.0</td>
<td>0</td>
<td>4461.6</td>
<td>7500</td>
<td>0</td>
<td>14454</td>
</tr>
<tr>
<td>6. Skills development</td>
<td>178.8</td>
<td>30.54</td>
<td>169.5</td>
<td>900</td>
<td>0</td>
<td>619</td>
</tr>
<tr>
<td>7. Adult literacy</td>
<td>215.84</td>
<td>31.34</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>8. Gacaca</td>
<td>1994</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9. Demobilisation and reintegration</td>
<td>5900</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10. Shelter provision for the homeless</td>
<td>0</td>
<td>0</td>
<td>832.5</td>
<td>0</td>
<td>0</td>
<td>22667.5</td>
</tr>
<tr>
<td>11. Development of sector strategies</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Budgetary allocations for priority activities</td>
<td>13653.29</td>
<td>302.74</td>
<td>12540.01</td>
<td>18100</td>
<td>3500</td>
<td>48020.9</td>
</tr>
<tr>
<td>Total budgetary allocations</td>
<td>150240.00</td>
<td>56400</td>
<td>37400</td>
<td>56210</td>
<td>15800</td>
<td>8189.1</td>
</tr>
<tr>
<td>Non-priority activities included in PRSP scenarios</td>
<td>n.a.</td>
<td>n.a.</td>
<td>15800</td>
<td>8189.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other Important Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Recurrent, Central</th>
<th>Recurrent, Provincial</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of Land Act</td>
<td>301</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Family Planning Programme</td>
<td>443</td>
<td>0</td>
<td>214.7</td>
</tr>
<tr>
<td>Soil Conservation</td>
<td>800</td>
<td>90</td>
<td>420</td>
</tr>
<tr>
<td>Decentralisation</td>
<td>1590</td>
<td>70</td>
<td>830</td>
</tr>
</tbody>
</table>
TABLE 6.1 shows the amounts allocated to these activities in the baseline scenario (the 2002 budget) and scenario 3.

The table indicates how important it is to look at the baseline scenario and the additional scenarios together. Some of the priority activities have been either undertaken, or planned for some time and are fully costed in the baseline scenario. This includes demobilisation and gacaca. Others, such as labour intensive public works, are new activities, and the figures for these are rather notional. For many of the priority activities, the PRSP additional scenarios represent a change in timing for activities acknowledged to be important (such as shelter provision and primary textbook provision) or an expansion of existing programmes (economic infrastructure).

Some of this attribution of expenses to priority activities is rather crude. Time did not permit a detailed disaggregation of, for example, Minagri’s budget to ensure that small subprogrammes which might not be strictly within the definition of small-scale agricultural intensification were excluded from the total figures. However, it is striking that over 80% of the total additional development budget envisaged under scenario three can be attributed to priority activities, and over half the additional recurrent budget. Only just over 20% of the baseline budget is allocated to these activities, which indicates that the additional expenditures reflect a real determination to make overall public expenditure more pro-poor.

It is important to stress that the Rwanda PRSP was written in the absence of well-defined sectoral strategies, and offers a framework within which such strategies can be developed. Hence the detailed expenditure proposals are likely to change and to become more specific over time. This is not unhealthy and experience in other countries has shown that once the need for sectoral strategies is clearly understood, plans can become more specific quite quickly.

6.2 ASSESSING POVERTY IMPACT OF THE SPECIFIC EXPENDITURES

As discussed in Chapter 3, where possible a number of different elements of potential poverty impact will be examined. These are:

- Direct impact in terms of the provision of goods and services to the poor by the public sector
- Indirect impact of public expenditure through the impact on the growth rate, both first and second round effects.
- Correspondence to the needs of the poor as expressed in the PPA.

In addition, issues of environmental and political and social sustainability will be assessed. Appropriate or necessary policy support for these activities will also be discussed.

Intensifying small-scale agriculture and livestock

101 Though there are queries as to how adequate these costings are. As will be discussed later, some of these activities are in the process of being recosted, at much greater amounts.

102 It should be noted that over 40 percent of the 2002 recurrent budget was in fact spent on priority programmes.
Almost 90% of the Rwandan population farm. 80% give own account agriculture as their main economic activity.\textsuperscript{103} Farm households as a whole are somewhat less well off than the general population (see Table 6.1 above). This largely reflects the rural-urban differential in living standards, but when the population is divided according to category of main economic activity, the two categories with the highest incidence of poverty are those reliant on agricultural wage labour (73%) and own account farmers (67%). This compares to a national incidence of poverty of 60%. A major part of addressing the problem of poverty in Rwanda has to be addressing the needs of the population involved in agriculture, whether by increasing the possibilities for income generation within agriculture, or by increasing the opportunities available outside the sector.

Historically agriculture has had a very low rate of growth, 0.5% in the 1980s and a negative rate of growth in the 1990s. This latter was very much affected by the disruption caused by genocide and war. However, even prior to 1994, overall production in the agricultural sector in Rwanda had stagnated and per capita calorie production had fallen to 1509 per capita per day by 1991, compared to a population requirement of 2100. Yields had fallen over the 1980s, due to over-intensive production, and increasing problems of soil erosion. Production was largely for food consumption and relatively few households produced cash crops for the market. However, small farmers were heavily integrated into local markets and produced around half of the food commodities on sale.

Post-1994, the agricultural sector faces the same problems, but from a weaker position because of the extensive decapitalisation which resulted from the genocide and civil war. The proportion of farmers using chemical fertilisers fell from 7% to 5% between 1990 and 2000. Access to livestock has also been affected, with a resulting impact on access to manure to maintain soil fertility. Although the overall number of cattle has increased since the major reductions during the war, much of this is due to returnees of 1994 bringing their herds with them. Inequality in livestock holding has almost certainly increased, both regionally and by wealth group.

The need for increased agricultural growth cannot be overstressed in Rwanda. The stagnation of rural productivity was a fundamental cause of the decline in incomes and increasing unemployment experienced in the late 1980s and early 1990s. Economic logic and international experience suggest that the early stages of nonagricultural development in rural areas are heavily dependent on demand generated by rural incomes. It is therefore acutely important to identify the constraints that have been depressing agricultural productivity.

The PRSP is based on the idea that increased use of agricultural inputs is potentially profitable for rural households, and that public action to support information and marketing is therefore critical. Recent experience in Ethiopia show that in highly-populated areas with depleted soils, there can be widespread interest in using fertiliser. However, the effect on incomes will also depend on the marketing of products, and this has been a problem in parts of Ethiopia during the expansion of fertiliser use, where some price collapses have occurred. The Rwandan government may wish to study the Ethiopian case more closely.

The growth strategy outlined in the PRSP focuses on expanding tradable agriculture. A growth rate of 5.3% in agriculture is estimated to generate non-farm rural

\textsuperscript{103} Profile of poverty in Rwanda, February 2002.
growth of 6.7%. This is an important contribution to an overall GDP target growth rate of 6.4%. 75% of agricultural growth is estimated to come from increased use of fertiliser, as opposed to 16% from crop intensification and 8% from extensive growth, mainly as a result of improved wetland management. The sources of growth by commodity vary from a predicted 3% growth in banana output (significant, because banana currently is estimated at a third of the total value of agricultural output) to 20% increase in output of potato. This reflects the high responsiveness of potato to fertiliser application found in field trials. The poverty reduction targets implicit within the PRSP, halving the proportion of people falling below the poverty line by 2015, is heavily dependent on achieving these growth targets. Public actions to support agriculture, and the establishment of appropriate support and incentives within the agricultural sector, are key to the Rwandan PRSP.

344. Increased export earnings are an important element for debt sustainability. Currently almost 50% of export earnings in Rwanda come from agriculture, in particular coffee and tea exports. In the first instance, most of the increased production projected in the target agricultural growth rate will go to meet increased domestic demand. Potato in particular is estimated to have a very high income elasticity of 1.45 in Rwanda. However, potato is also exported to Burundi, and there is potential for exports to Kenya, Uganda, Tanzania and DRC, either for ware potatoes or seed potatoes. One estimate indicates that with appropriate increases in quality and marketing, potato exports could reach as much as $17 million by 2020. This compares with current export values for coffee of $21 million. Increased production levels of banana and fruit and vegetables could also have a positive impact on the Balance of Trade, by reducing import levels. This again would be dependent on improving quality in both production and marketing.

345. Support to agriculture is also highly rated by the poor themselves. Agriculture was identified in the NPA as the sector most associated with problems identified by communities, though fewer than one in three communities identified agriculture-specific strategies as priorities. Access to land was the single most frequently identified priority problem by communities. Without further questioning, it is difficult to assess the extent to which increased returns to existing land plots would meet these community concerns. However it is reasonable to suppose that access to and understanding of more efficient and effective agricultural practices would go some of the way to easing perceived land shortage.

346. There are a number of key areas for government activity to encourage the process of improving the efficiency and quality of agricultural production and increasing commercialisation, in both the domestic and export markets: research into improved crop varieties and production methods; extension to promote the adoption of improved varieties and methods, in particular fertiliser use; monitoring both input and output markets to identify potential bottlenecks in both; improving livestock quality; and providing appropriate incentives for appropriate soil conservation and fertility improvement.

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105 The true level of dependence on tea and coffee is likely to be higher, if the effects of the recent cotton boom are removed.
107 Goossens, op.cit.
108 However the top strategy identified, organisation in associations and cooperatives, could easily be agriculture related.
activities. Although in some countries and for some commodities research activities have been privatised, they are often funded and organised by commodity organisations. Poor farmers have limited resources to fund research activities themselves and are often not well organised. The overall benefits to the farming community from research are such as to justify continued government funding, in particular for those crops that are grown by a wide spectrum of farmers. The long-term benefits from improved soil conservation again justify government support for these activities.

347. The baseline expenditure programme for agriculture in the PRSP encompasses a number of projects under the development budget that respond to some of these concerns. A number of donor projects provide support to the development of input markets, the seed sector, the development of dairy cattle and recapitalisation in the rural sector, all of which are important elements of the government’s commercialisation strategy. The funding proposed for the extension and commercialisation division in the baseline scenario seems rather limited, 0.15 FRw billion, all at the central level. This is less than the recurrent costs of the agricultural production, livestock or forest resources divisions. Part of this may be a result of how extension work is defined. There may well be officers undertaking extension activities in other divisions. Part may also be a result of the state of the transition of responsibilities from centre to provincial level under the decentralisation process, which makes budgets difficult to interpret, as between central and provincial. However, an effective extension service is one of the key instruments that a government has to stimulate a more commercially oriented agriculture, by raising returns to existing farming activities and assisting farmers to take advantage of market opportunities.

348. There has been much written over the past few decades on the appropriate level of public expenditure on agricultural research and development. Studies on agricultural research suggest that rates of return are often extremely positive, of the order of 30-60%. Studies of returns to investment in agricultural research and technology transfer for maize and cowpea in Africa show rates of return of 21-135%. The overall level of expenditure for research and extension in agriculture included in the baseline scenario is roughly 0.9 billion FRW. This is about 0.2% of agricultural GDP. Operational guidelines for appropriate levels of expenditure range from 1% to 3%. The increases included in scenario 3 would still keep the overall level for R&E well below this.

349. The additional scenarios contained in the PRSP allocate increased expenditure to the establishment of a fund for seasonal credit, further support to developing a national seed multiplication and distribution system, milk collection centres, soil conservation activities, building of 15 agricultural markets and a strengthening of the extension service. The unconstrained budget simply increases the amounts allocated to these activities.

350. As indicated above, public expenditure on agriculture will have its greatest impact on poverty through its impact on growth. However, in the short-term, certain sections of the population will benefit more directly than others. For example, milk collection centres will directly benefit dairy farmers in the specific catchment area, and possibly urban milk consumers. In the time available for the study, it was not possible to undertake a detailed


\[110\] The results of the recent PER in MINAGRI should allow a much better assessment of overall resources going towards R&E, and the possible constraint on increasing expenditure quickly in this area.
impact assessment of the entire agricultural strategy. Given the importance of increasing potato production the team has analysed the EICV to assess the current status of potato producers relative to other farmers. Table 6.2 shows that farm households as a whole are worse off than households in general. However, households growing potatoes are better off than farm households as a whole, and have relatively fewer households in the lowest quintile than the population as a whole. Their representation in the top quintiles is similar to the population as a whole.

**TABLE 6.2 HOUSEHOLDS GROWING SPECIFIC PRIORITY CROPS BY QUINTILE**

<table>
<thead>
<tr>
<th>% of hhs</th>
<th>% of farm hhs</th>
<th>potatoes</th>
<th>tea</th>
<th>coffee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1er quintile</strong></td>
<td>17.65</td>
<td>18.43</td>
<td>10.43</td>
<td>18.39</td>
</tr>
<tr>
<td><strong>2eme quintile</strong></td>
<td>18.65</td>
<td>20.11</td>
<td>20.18</td>
<td>16.76</td>
</tr>
<tr>
<td><strong>3eme quintile</strong></td>
<td>20.19</td>
<td>21.70</td>
<td>22.64</td>
<td>24.73</td>
</tr>
<tr>
<td><strong>4eme quintile</strong></td>
<td>20.96</td>
<td>22.02</td>
<td>24.59</td>
<td>22.95</td>
</tr>
<tr>
<td><strong>5eme quintile</strong></td>
<td>22.55</td>
<td>17.73</td>
<td>22.15</td>
<td>17.17</td>
</tr>
<tr>
<td>% of households growing</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Compared to farmers growing the traditional export crops of tea and coffee, potato farmers are also better off. Tea and coffee farmers show similar poverty levels to the farming population as a whole.

It is inevitable that, to implement an agricultural growth strategy that focuses on increased commercialisation of agriculture, the main targets of government support in the first instance should be those farmers who are capable of producing a marketable surplus quite quickly. What this means for poverty reduction is that it is important to monitor both the success of the strategy in increasing the income of the target farmers and the anticipated linkage effects in the rural areas, because the greatest effects on poverty reduction will be indirect.

Although beans and sweet potatoes are grown throughout Rwanda, production of other crops tends to be fairly geographically specific, for topographical reasons. Programmes focussed on specific crops will tend to affect certain regions more than others. Thus, according to the data from the EICV as shown in Table 6.3, potato farmers are concentrated in Gisenyi and Ruhengeri, tea producers in Gikongoro and Cyangugu and coffee producers in Cyangugu, Gitarama and Butare. Of these provinces, Ruhengeri, Butare and Gikongoro are amongst the poorest in Rwanda, whereas Cyangugu and Gitarama are amongst the better off rural provinces. As the indirect

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111 The quintiles used in the EICV are based on individual analysis. This was translated into household as a basis on which to compare farm households. Therefore, the proportions in each quintile for households differ somewhat from the 20% that might be expected. The household analysis indicates that larger households are more likely to appear in the lower quintiles, and smaller households are more likely to be in the upper quintiles.

112 Given the overall levels of rural poverty in Rwanda, even if agricultural support were to be focussed solely on potato, it would still directly benefit some very poor farmers. It could be argued that as long as farmers are not explicitly excluded from specific programmes, any successful initiative in the rural sector will reduce poverty.

113 Ministry of Agriculture data from the FSRP surveys, show slightly different distributions. However, it is hoped that the two surveys will be interlinked in future, allowing for greater consistency in data results.
effects of growth are most likely to occur in the first instance in areas local to the increase in income, this means that some of the poorer provinces in Rwanda will benefit from successful agricultural growth. Ruhengeri has also been very badly affected by insecurity and population movement, so that progress in this area may also help the development of political stability and consensus.

### TABLE 6.3 HOUSEHOLDS GROWING SPECIFIC PRIORITY CROPS BY REGION

<table>
<thead>
<tr>
<th>Region</th>
<th>% of hhs</th>
<th>% of farmers</th>
<th>% of farmers potatoes</th>
<th>% of farmers tea</th>
<th>% of farmers coffee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butare</td>
<td>8.76</td>
<td>9.48</td>
<td>5.03</td>
<td>0.00</td>
<td>13.70</td>
</tr>
<tr>
<td>Cyangugu</td>
<td>6.99</td>
<td>7.36</td>
<td>0.63</td>
<td>28.83</td>
<td>19.81</td>
</tr>
<tr>
<td>Gikongoro</td>
<td>6.33</td>
<td>6.94</td>
<td>1.61</td>
<td>30.08</td>
<td>8.01</td>
</tr>
<tr>
<td>Gisenyi</td>
<td>9.46</td>
<td>9.89</td>
<td>25.03</td>
<td>9.69</td>
<td>9.93</td>
</tr>
<tr>
<td>Gitarama</td>
<td>10.62</td>
<td>11.52</td>
<td>3.85</td>
<td>10.83</td>
<td>14.52</td>
</tr>
<tr>
<td>Kibungo</td>
<td>8.28</td>
<td>8.94</td>
<td>14.81</td>
<td>0.00</td>
<td>9.06</td>
</tr>
<tr>
<td>Kibuye</td>
<td>5.98</td>
<td>6.46</td>
<td>2.13</td>
<td>4.42</td>
<td>6.16</td>
</tr>
<tr>
<td>Kigali NGali</td>
<td>11.62</td>
<td>11.22</td>
<td>3.70</td>
<td>0.00</td>
<td>8.52</td>
</tr>
<tr>
<td>Ville de Kigali</td>
<td>7.00</td>
<td>1.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Ruhengeri</td>
<td>11.63</td>
<td>12.57</td>
<td>17.81</td>
<td>0.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Umutara</td>
<td>3.86</td>
<td>4.13</td>
<td>8.98</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

354. The most important element in the growth strategy is increased use of fertiliser. Increases in potato, tea and coffee production are all dependent, in the first instance on increasing the use of organic and inorganic fertiliser. Organic fertiliser is well understood in Rwanda, but reduction in livestock after the genocide has meant the access to manure has fallen. The pilot project on community action planning, ‘ubudehe mu kuro wanya ubukene’, found that the single most popular community project in Butare was provision of goats, primarily because it was felt that their manure would address the problem of reduced soil fertility. However, to achieve the high potential growth rates, organic fertiliser has to be complemented by inorganic fertiliser. One of the main barriers to increased use of this is lack of knowledge. Minagri surveys indicate that over 50% of the 88% of farmers who do not use inorganic fertiliser say this is because of lack of knowledge. This compares with 30% who quote price as a barrier and only 13% who say it is not available.  

355. Fertiliser has been shown to have high returns in the Rwandan context. A recent survey of existing research on fertilizer response indicates that for certain major crops, soybeans, potatoes, climbing beans, maize, sweet potato, cabbage and rice in some areas, the response to appropriate fertilizer use was sufficiently high to warrant strong fertilizer promotion campaigns. The studies showed value-cost ratios of between 2 and 4 for most crops, and up to 12 for potatoes. For farm households growing for the market,  

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116 Fertilizer response and profitability in Rwanda, V. Kelly and A Murekezi, FSRP, February 2000.  
117 This is the cash return relative to the cost of buying fertilizer.
and in particular growing potatoes, this could mean a significant increase in family income, provided that a) the increase in demand for fertilizer does not lead to an increase in price and b) the increase in production does not lead to a swamping of the market and a fall in price received for the commodity\textsuperscript{118}. If the latter happens, then some or all of the benefits of increased production are transferred to the consumer. This depends on the elasticities of demand and supply. Rwanda’s production of tea and coffee are unlikely to have a major impact on international prices, but for other commodities, such as regionally traded potatoes, care will have to be taken to ensure that the size of Rwandan exports do not flood the regional export market.

356. The only commodities shown not to have positive returns to increased fertiliser inputs were wheat, cassava and sorghum.

357. These positive findings on the profitability of fertiliser use are in contrast to the situation in many countries in Africa, where the concern has been that returns are too low to justify increased use of fertilizer at current market prices. These data clearly support the emphasis placed on increased fertilizer use in Rwanda. However, government strategy to achieve this is relying heavily on the private sector. In many countries the government extension service would play a key role in increasing knowledge and training farmers. However, the extension service in Rwanda has been streamlined and even within that streamlining, there are a considerable number of unfilled posts. A survey undertaken of agricultural demonstrations, in Rwanda, shows that these are almost entirely done as part of a specific development project or by an NGO, World Vision\textsuperscript{119}. There appear to have been few demonstrations carried out by Minagri as part of their regular activities. If it is not possible for the existing extension service to carry out a targeted fertilizer promotion, then Minagri should be giving consideration to alternative ways of funding and implementing such a programme.

358. The agricultural growth strategy is very supply-side led. There has been a detailed study undertaken of the potato sector\textsuperscript{120}, and the FSRP as also undertaken work on the coffee sector\textsuperscript{121}. However similar work needs to be carried out for other major crops, and the Marketing Department of Minagri must be in a position to monitor market trends and prices, and work with the extension service to improve marketing capabilities of farmers. In addition to supporting farmers in commercialisation, and analysing market options, Minagri might consider working with government and private sector trade organisations to increase the profile of Rwandan products, both regionally and internationally. This is beginning to happen for coffee, but could benefit other crops as well.

359. At present there is one person responsible for marketing issues in Minagri Again, this is an important issue, not just of resources, but of government capacity to recruit and retain appropriately qualified staff. This raises an important issue in regard to the implementation of the agricultural sector plans. Minagri has a considerable number of unfilled posts, particularly, but not only, in the extension service. Financial resources are obviously one element of this, but it could be important to undertake a study on what is

\textsuperscript{118} This happened for potatoes in the late 1990s. Such events can have major disincentive effects on commercial production.

\textsuperscript{119} Agricultural Demonstrations in Rwanda during season 2002A, A baseline study.(draft) J-P Rucakibungo, Abt.

\textsuperscript{120} Goossens, op.cit.

\textsuperscript{121} Farm-level perspectives in Rwanda’s coffee supply chain coordination challenge, S. Loveridge et al., Agricultural Policy Synthesis, FSRP, March 2002.
The poverty impact of the sectoral outputs financed by the increased expenditures

needed to create an effective and well-staffed agricultural service to support the agricultural growth strategy, and then act on its recommendations.

360. The various activities envisaged within the general heading “intensifying small-scale agriculture and livestock” are focused on achieving the growth rate target of the PRSP. The expenditures seem appropriate to this, and, if anything, rather modest compared to the overall task facing Minagri. The costing should be reviewed in the light of the current PER work.

361. The impact of these expenditures on the poverty target (halving the percentage of the population under the poverty by 2015) will largely be through the effect of increases in growth in the agricultural sector on rural non-farm employment and on the incomes of farm households directly. Empirical analysis on the relationship between agricultural growth and poverty reduction indicate that when agriculture accounts for a large share of aggregate employment and when growth is broad-based (i.e. targeted to products that are produced with labour intensive technologies and by a wide range of rural producers) then agricultural growth will have a high multiplier effect on the rest of the economy, and will also be poverty-reducing\textsuperscript{122}. The initial asset distribution matters.

362. At this stage we cannot make quantitative estimates of the impact of the proposed expenditures directly on the incomes of poor farm households. The raw data exist to develop a simple farm-household model to estimate the effect of, for example, increases in fertilizer use on poor farm household incomes, but this would involve bringing together information from the agricultural surveys and the EICV, and time did not permit this. The agricultural growth strategy, as expounded in the PRSP, depends on achieving high growth rates in a few crops – potatoes, tea and coffee – and respectable growth rates in bananas, vegetables and livestock. Although potatoes are grown at present by farmers who are better-off than average, there is a case for saying that poverty amongst farm households in Rwanda is so pervasive that any expenditure which increases yields and income is likely to have a positive impact on poverty. Mellor argues that an initial skewing of the benefits of agricultural growth towards the higher income rural producers is consistent with poverty reduction if these producers spend a considerable proportion of their income on local non-tradables, as this will create local employment. However, none of these programmes appear to be targeted, not recognise the particular constraints faced by women or other marginalized groups.

363. It is to be hoped that, as the agricultural sector strategy is developed, that its own targets will be developed, not just in terms of agricultural growth rates, but also in terms of the poverty and distributional impact of Minagri’s activities.

364. The environmental impact of Minagri’s activities is likely to be mixed. There have been concerns raised over the project for improved management of the marshlands. However, the activities identified under the additional scenarios of the PRSP, seasonal credit, seed multiplication and increased support to marketing and extension, are likely to be, at worst neutral, and may well improve soil conservation and quality. Rwanda farmers are very aware themselves of environmental impact on their livelihoods, and are likely to invest in soil improvement themselves, given the resources. The impact of improved marshland management will depend on where and how it is implemented; if attention is

focused on those areas where farmers are already using marshes unsustainably, its impact could be beneficial. There is a value judgement to be made about the importance of biodiversity as well as incomes in this context.

365. From the perspective of political sustainability, the same argument can be made on agriculture that was made about poverty reduction in general; as long as agricultural support is inclusive, it is likely to promote improved social cohesion. Ruhengeri, which is one of the major potato growing areas and likely to benefit early on from a focus on increasing potato production, has been one of the most troubled provinces because of its geographical location. However, it has good soils and the potential for considerable improvement in overall welfare.

366. Improvement in agricultural performance is not just dependent on government support. Farmers themselves are the most important actors in the sector, and they have to feel that the institutional context is supportive and provides incentives for them to invest in their own land. A very important issue here is land policy, which will be discussed later on in this section. Also, success in the agricultural sector will be dependent on the provision of supporting services, such as transport, which are the responsibility of other ministries.

**Labour intensive public works**

367. The second priority activity included in the PRSP is for a programme of labour-intensive public works for the development of soil and water management and forestry management. The details of this are still being worked out, but it is envisaged that it would include improvement and extension of rural roads, reforestation, terracing, soil conservation, drainage and irrigation works in the lowland swamps, provision of potable water and provision of ground limestone (for use alongside inorganic fertiliser).

368. Labour intensive public works are often undertaken as part of a system of safety net approaches, in conjunction with targeted food distribution programmes and other ways of reducing vulnerability of the poor. Perhaps the most well known of these is the Maharashtra Employment Guarantee Scheme. The rationale for public works is usually presented as a way of conferring transfer benefits to the poor, in the form of additional income or payment in kind, while using their labour to build infrastructure, such as rural roads, for developmental purposes.

369. The rationale given for investing in labour intensive public works programmes in Rwanda is rather more sophisticated and complex. As discussed above, the basic impetus for poverty reduction in Rwanda is seen to come from agricultural growth. Through linkages with the rural non-farm sector, and the urban sector, this will have multiplier effects on the rest of the economy, and ultimately increase the demand for labour in the non-agricultural sectors. This in turn will tighten labour markets, put upward pressure on wage levels, and thereby reduce poverty. This argument is expounded in a paper by John Mellor, where he estimates that the time necessary for this tightening of labour markets to occur is around ten years.

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123 Subbarao, K., Public Works as an Anti-poverty Program: An Overview of Cross-Country Experience, Paper given at ASSA Annual Meetings, January 1997 (available on the WB poverty net website), gives a good overview of these issues.

370. To speed up the process of absorbing unemployed labour in the workforce, Mellor suggests introducing a programme of rural public works. He argues that this would create additional employment (through multiplier effects from that part of the income transfer which would be spent on non-food goods and services) and, depending on the level of wage paid, bring a significant part of the population up to the poverty line. Depending on the specific type of public works projects included, there could also be a significant impact on access to markets (rural roads) and environmental sustainability (terracing, soil conservation and reforestation). He estimates that it would take five years for the public works programmes to build up to a level\(^\text{125}\) whereby unemployment would be eliminated. After that the programme would phase down, as the demand for labour expanded. By year 12 the need for the programme would have been eliminated.

371. The concept of establishing public works programmes that could address two issues simultaneously (rural unemployment and rural decapitalisation) is inherently attractive. However, the implications of establishing such a programme on future public expenditure, growth and poverty reduction depend on the validity of the assumptions made about growth and employment elasticities and the exact design of the programme.

372. The programme proposed is presented as a temporary measure that would be wound down after labour markets tighten, a period estimated to be twelve years. This estimate is based on assumptions about the relationship between growth in different sectors of the economy and the rate of growth in employment (employment elasticities). These are that the rural non-farm sector will grow in response to growth in the agricultural sector and that the urban informal sector will grow in response to growth in the formal urban sector. The underlying linkage between agricultural growth and non-agricultural growth is 1.5, and the same linkage is assumed between formal and informal urban sector. The value of these linkage effects are based on research undertaken by IFPRI, and seem consistent with experience in other parts of the world. Employment elasticities in these two sectors (rural non-farm and urban informal), which are demand-led, will be higher (0.9) than in the other two sectors which are perceived as led by technology and investment (0.6 and 0.4 respectively). This leads to an overall elasticity of employment to GDP growth rate of 0.61.

373. It is consistent with the results of studies in Asia, in particular, that rural non-farm and the urban informal sector should be the more dynamic sectors for poverty reduction in the medium-term, though in the short-run the size of the agricultural sector in Rwanda means that it will be the most critical in the short-run for poverty reduction. The size of the links (both between growth in the different sectors and between growth and employment) seem reasonable and are based on African studies. However, there is little discussion of the time frame over which these might be expected to happen. The IFPRI work is based on analysis of the demand effects resulting from an increase in agricultural growth, and there is little analysis of the time it takes to generate a supply response from the non-farm rural sector. Micro level work in Malawi, undertaken by Pauline Peters of tobacco-growing areas, indicates that it could take four or five years for the non-farm sector to respond to the stimulus of increased income in the farm sector.

374. There are other factors that will affect the time frame proposed for the programme: the initial level of un- and under-employment in the rural sector; the multiplier, and

\(^{125}\) This is assuming that it is feasible to increase public works employment by 32,000 a year, starting from a base of 10,000.
The impact of increases in public expenditure on poverty in Rwanda

therefore employment creation effects of the income transfer arising from the public works programme; and the overall growth rates achieved in the rest of the economy. There is some degree of uncertainty about the levels of unemployment in Rwanda. Mellor calculates that they must be around 14%, based on the labour requirements of the farm size distribution in Rwanda. He notes that a household survey undertaken by MSU shows that 9% of the workforce declare themselves unemployed. The EICV, which does not specifically ask if household members are unemployed, shows between 11-12% of the population over 7 years of age, are neither working nor in education. It also shows considerable variation in hours worked per week, with those in own account agriculture having the lowest number of hours worked, which could indicate considerable underemployment in agriculture.

375. There are two factors that could lead to increases in the number of people, and males in particular, not fully employed. Demobilisation of the army could increase the potential workforce by 50,000 and the return of genocide prisoners to the community could add at least that much again. Given these figures, there is unlikely to be a lack of take-up for a public works programme, even if the current number of people regarding themselves as unemployed is less than that given by Mellor. The demand for employment on public works programmes will also depend on the wage rate offered, and whether it is in cash or kind.

376. The reduced demand over time anticipated for the public works programme is dependent on the multiplier effects of overall growth in the economy and, more locally, the injection of resources resulting from the income transfer implicit in the public works. If the overall growth targets set out in the PRSP are not met, or if the injections of resources, whether cash or in kind, take time to stimulate either agricultural or non-farm activity, then it may not be possible to cut off the PW programme as anticipated. In short, from an economic perspective, although the scenario presented is internally coherent, there are considerable risk factors, not the least of which is a failure to achieve high growth rates in the overall economy. If employment opportunities are not created through growth, this could seriously affect the ability to withdraw from a FFW programme in ten or even fifteen years' time. There could still be a good case for a public works programme that will contribute to poverty reduction, growth, environmental and social objectives.

377. However, there is little detail available at present about how these public works might be designed, and about the workings of the commodities and labour markets that could be affected by such a programme. The team understands that an experienced consultant is being brought into Rwanda to design and cost such a programme. Until this has been done, it is difficult to do more than point out the critical assumptions which have to be validated to ensure that such a programme will have the desired outcome, both in terms of a smoother exit of labour from the agricultural sector, and in terms of the benefits of the PWP accruing to the poor.

378. The impact of a PW programme on poverty depends on the choice of participants, the size of the wage offered and the incidence of benefits from the public goods and services created by the PW. Experiences in other countries indicate that decisions on the level of wage, and whether it is offered in cash or in kind are critical as to whom the PW programme attracts. Too high a wage, and severe rationing of access will have to be employed, which may disadvantage groups who have poor political connections locally. Payment in food is often seen as more attractive to female participants, particularly where feeding the family is primarily the responsibility of the woman. Some studies have
shown that women spend more of income received from public works programmes on food commodities than men, who are more likely to spend the income on items such as tobacco and alcohol, which do not promote overall family welfare.

379. PW programmes can be designed to have an active influence on the distribution of beneficiaries, rather than leaving it primarily to market forces. In South Africa, PWPs are mandated to ensure that at least 60% of those employed are female, 25% youth and 2% disabled. These quotas are intended to ensure that the programmes assist in balancing skewed patterns in access to opportunities and resources. However, in Rwanda, the choice might be to focus also on ex-combatants and men released from prison. The question also should be asked about the ability of different groups to participate in PWPs. The EICV shows roughly similar numbers of hours worked in agriculture by men and women. Women are likely to spend much more time in unpaid work in fetching water, housekeeping and caring for family members. This could mean that participation in PWPs create even more demands on their limited time. This can be addressed by choices as to how much time any participant has to spend on the programme. Do they have to participate for whole weeks at a time, or can they spend two mornings a week, for example?

380. However, these considerations are more appropriate to a basic social safety nets programme, than a temporary programme for easing the transition away from the agricultural sector. It will be important to make very clear the overall objectives of the PWP. Regardless of objective, there is the issue of who benefits from the output of a PWP. Will the goods and services produced really be public goods, or will they be captured by more privileged sections of the community? Who decides what lands should be terraced?

381. The PWP could also have important effects on growth, both positive and negative. On the positive side, the goods and services produced by the programme could increase access to markets for communities, and increase agricultural productivity in the short to medium term through soil conservation activities and provision of crushed lime as a complement to inorganic fertilizer. However, if the programme is not carefully designed, it could push up local wages and, if it is based on food for work (FFW) as Mellor's paper suggests, local food markets could be disrupted. Mellor proposes that the PW programme is combined with an ambitious food price stabilisation programme, where food is either purchased locally or imported, depending on local food market conditions. This would require the setting up of a price monitoring system and a level of food market management which has not been seen to date in any of Rwanda's neighbours, and possibly not outside of the Indian subcontinent. A cash-based programme would increase the local demand for food. The influx of cash would provide an impetus towards better food market development, though there could be short-run food price rises.

382. There has not been much analysis of the disincentive effects of food aid in terms of the direct impact on local food markets. However, Bartlett et al.126 review experience from Ethiopia that shows that participants in FFW programmes are much less likely to intensify their agricultural production, or use fertiliser, pesticides or irrigation than those who do not participate, even allowing for farm size, labour productivity or other indicators of well-

126 op.cit.
The impact of increases in public expenditure on poverty in Rwanda

being.127 If the Rwandan programme manages to target people who then go on to leave the land and get employment in the off-farm sector, this may not be an important issue. However, if these relationships are duplicated in Rwanda, and the participants in FFW remain linked to their farms then the programme could have a negative effect on the local agricultural economy. It is not easy to predict the impact of PWP$_{s}$ on poverty, and production and investment incentives in rural areas. As one recent review of FFW programmes concludes, “the devil indeed appears to be in the local factor market details”.128

383. The environmental impact of the activities proposed for the PWP should be positive, and the programme could be an important vehicle for stimulating community-based conservation activities. However, there are also social issues that have to be considered. If roads and terracing are produced by paid labour in a FFW programme, will it be possible to revert to traditional mechanisms for mobilising voluntary labour to ensure that these investments are maintained? In other words, how sustainable is the investment process, and who will benefit from the output of such investment? These questions should be addressed in the design phase, but are raised here, because such issues have undermined FFW programmes in other countries.

384. The cost figures given in the PRSP are very preliminary, and will be revised once programme design has gone ahead. Examination of FFW programmes in other countries indicates that they are likely to be an underestimate. A survey of a number of countries shows that wage costs vary between 0.3 and 0.6 of the total cost of the programme129. For road construction programmes, this ranges from 0.4 to 0.5. In Mellor’s paper, the ratio of wages to total cost appears to be estimated at around 0.7. This would seem to indicate that the figures given in the PRSP could be an underestimate of around 50%, since the costs are found by multiplying up from a target labour force to be absorbed.

385. The success and impact of public works programmes has varied considerably from country to country. Capacity to manage such a programme is one important element, and one that has to be examined carefully in Rwanda, particularly when decentralisation is putting considerable pressure already on local authorities. It may be that such a programme has to be rolled out on a pilot basis, so that capacity issues can be assessed.

386. In summary, a well-designed public works programme could have a positive effect on both poverty and growth targets. However, the programme is likely to cost more, and to be longer-lasting than has been indicated in the PRSP. This raises the question as to whether the PWP should be seen rather as the beginning of a social safety net programme, rather than a temporary way of employing labour which would be absorbed into the labour market by growth processes over time. There is a high probability that a PWP will turn, de facto, into a social programme because of the unpredictability of the time factor in the tightening of labour markets. This has important implications for the objectives and design of the programme, and should be addressed from the outset of the programme.

127 It is not clear whether this evidence refers to incentive effects at the household level rather than effects on food markets, in which case activity would be depressed at the level of the community in which food for work is provided rather than the participant households.
129 Subbarao, op.cit.
The poverty impact of the sectoral outputs financed by the increased expenditures

**Economic Infrastructure**

387. This is by far the largest activity, expenditure-wise, proposed under the additional scenarios, reflecting the importance placed on boosting economic growth. The two main areas on which expenditure will be focused are road maintenance and rehabilitation and rural electrification.

388. Rwanda is a land-locked country, and the majority of its exports have to be transported by road either to neighbouring countries for sale, or through those countries to the coast for export by sea. Poor transport links add to the cost of exports — in fact it has been argued that high transport costs are a particularly strong non-tariff barrier for many African countries\(^{130}\). To address these constraints, the PRSP additional scenarios propose to increase expenditure on road maintenance and rehabilitation. In both scenarios, there is a proposed increase of 7.5 billion FRw for each of the three years, increasing the total amount for road maintenance by a factor of around 300%. For road rehabilitation, scenario 2 proposes a gradual increase over the three years, culminating in a doubling of expenditure\(^{131}\) by the third year. The third scenario more than triples the additional work. The additional scenarios also contain funds for feasibility studies, for improved international railway links, and for port improvement.

389. The other major economic infrastructure investment in the PRSP, particularly the additional scenarios, is in energy, both formal sector energy production and for rural electrification. It is anticipated that, by investing in the public sector company Electrogaz, and improving its efficiency, the price of energy in Rwanda, which is very high, can be reduced, and Rwanda can become more self-sufficient in energy production. Rural electrification is seen as an important enabling investment to encourage the development of non-farm activities, and hence provide incentives for people to move out of agriculture, thereby easing the stresses on the land. There is also funding for renewable energy promotion and a stove programme under the additional scenarios, to address issues of deforestation\(^{132}\).

390. There is a degree of uncertainty in the details of both of these two major activities. Where road maintenance and rehabilitation is concerned, the plans proposed by Minitraco\(^{133}\) are much more comprehensive than those contained in the PRSP, and careful prioritisation will have to be undertaken. With the investment in electricity, the precise form this takes will depend on progress in the move towards increased private sector participation in the sector. There was some debate during the preparation of the PRSP about the potential for private sector participation, for instance in the development of a methane plant in Lake Kivu. It will be important to compare the costs of imported electricity with those of the electricity that can be produced domestically with microcentrales before committing funds.

391. Improvement in existing roads has two main benefits: savings in transport cost and savings in travel time, both for personal and commercial travel. This would increase access to public services, such as education and health, and increase the

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\(^{131}\) In fact expenditure in the baseline on road rehabilitation falls in year 3, and the additional expenditure would effectively restore the gross levels.

\(^{132}\) At present fuelwood is the main form of energy used in Rwanda.

\(^{133}\) Préparation du Cadre Sectorial et Programme d’Investissement, Minecophin and Minitraco, 2002.
competitiveness of productive processes. It is clear, both from the PRSP and from discussions in Minitraco, that the main driving force behind the roads programme is cost reduction to encourage growth. The PRSP quotes that the construction of the road from Gitarama to Kibuye reduced travel time by 75% and increased producer price of coffee by almost 50%.\textsuperscript{134} When Minitraco were asked about the basis on which they prioritised roads, the team were told that the priorities were for the areas producing cement, tea and coffee. This is consistent with the role of agriculture in the growth strategy of the PRSP, though not necessarily the commodity mix implicit in it.\textsuperscript{135}

392. The ministry’s investment plan gives rates of return for the proposed road rehabilitation projects that range from 10% to 25%. These calculations, and the plan itself, were developed by an international consultancy company, and no-one at the ministry could assist with the details of the calculation. The ministry’s capacity to carry out basic economic analysis is limited, and they do not have a socio-economist on their staff.

393. What evidence is there that investment in improved roads will result in increased growth? A recent review of recent research on infrastructure\textsuperscript{136} identifies that internationally, public capital accumulation in infrastructure shows a rate of return of 14.2%, which is only slightly below that for equivalent private sector investment. A study in India showed that public investment in electricity and roads yielded substantially positive externalities, and accounted for nearly half of the total factor productivity residual in the growth equation for manufacturing.\textsuperscript{137} There is a clear case for investment in roads to assist Rwanda in reaching its growth target.

394. The case for investment in roads from a poverty perspective is more complex. The road rehabilitation programme in Rwanda is primarily for national network roads. These link primarily urban centres and are the main channels for commerce. However, most of the poor access the national network through rural and feeder roads. The division of responsibilities for rural roads is rather confused. In theory they are the responsibilities of the districts, but when community building of local roads almost disappeared as a result of the genocide and war, the centre took responsibility for putting in place the structures for the communities to build on. This limits the number of the poor who might be expected to benefit directly from the programme to those who live within easy access of the major road network. It was not possible to estimate what proportion of the rural population’s access to services, markets etc, would be improved as a result of rehabilitating these roads, partly because the details of which roads would come under the different scenarios cannot be finalised until the priorities have been agreed and partly because it is difficult to assess what a reasonable hinterland for a national road in Rwanda might be. Once those elements were in place, it would be relatively straightforward to estimate the number of the poor who might benefit directly from the programme. The increased benefits from reducing transport costs should feed back to

\textsuperscript{134} The study team were unable to identify the study on which this statement was based.
\textsuperscript{135} Potatoes were not mentioned by Minitraco, and are perhaps the most important commodity targeted for increase in the agricultural sector.
\textsuperscript{136} C. Willoughby, Infrastructure and Pro-Poor Growth: Implications of Recent Research, OPM, for DFID, 2002 (mimeo)
\textsuperscript{137} Hulten, Charles R., Bennathan, Esra and Sylaja Srinivasan, Infrastructure’s Impact on Productivity Effects, prepublication draft quoted in Willoughby, op.cit.
the primary producers, i.e. farmers, depending on the competitiveness of the market system\textsuperscript{138}.

395. Another possible source of direct benefit for the poor would be increased employment opportunities. At the national level labour-intensive methods are not being used currently to build roads. Mintraco agrees that, in principle, it would be beneficial to use more labour intensive technologies, but that in practice the use of cement implied would actually increase overall cost.\textsuperscript{139} Investment in rural roads seems a more likely candidate for increasing employment, as indicated in the discussion above on labour-intensive public works.

396. There have been a number of international studies at a broader macro level, which have examined the impact of investment in infrastructure on poverty. Notably IFPRI has carried out two major studies that look at the relationship between infrastructure and poverty in different regions in a country, one in India and one in China\textsuperscript{140}. The IFPRI studies show that in India, an additional £1000 expenditure on roads would result in an additional £5310 in agricultural GDP, and four fewer people under the poverty line. In China the corresponding figures are £2120 and 3.9. Rural GDP in China would increase by £8830. In Western China, although the increase in rural GDP was lower (£4290) the reduction in the number of the poor was greater (12.7). The equivalent figures for electricity provision were much lower, but this was put down to the high level of rural electrification already existing in both countries.\textsuperscript{141} Clearly these figures cannot be taken as indicative of likely returns to investment in Rwanda, but they do provide evidence of the importance of infrastructure expenditure.

397. In other countries there have been high levels of investment in roads, but the results on poverty are felt to have been disappointing. In Nepal, many road programmes are now taking a broader approach and linking investment in roads with access planning at a local level. There, methodologies are being explored to ensure that roads, markets, health services and education are being linked to enable the population to benefit more fully from the investment. As a part of the process, studies are being undertaken and capacity improved to develop new income generating activities as a result of improved access.\textsuperscript{142}

398. The EICV gives some evidence about accessibility to government services. In rural areas, over 50% of communities are more than 5 km away from a health centre. However, the results of the various different surveys recently undertaken indicate that financial accessibility is a much greater constraint to use of health services than physical accessibility. In any case, the road rehabilitation programme would only increase physical accessibility for a relatively small proportion of the population. Primary schools are more

\textsuperscript{138} In other African countries, for example Malawi, the view has been expressed that transport costs are kept high as much because of cartels amongst the big transport companies as the condition of the road network.


\textsuperscript{141} The figures quoted come from an analysis of the IFPRI work contained in Willoughby, op.cit.

physically accessible, the average distance being 2.5 km. The mostly likely direct effect on the poor of the roads programme could be a reduction in the cost of interurban journeys. Even in this case, the major beneficiaries would be the highest expenditure quintile, who spend almost 60 times as much on transport as the lowest quintile, who currently spend less than 400 Frw a year on transport.

399. There is not a strong case for additional expenditure on roads and electrification on the basis of environmental sustainability or social cohesion. The programme to encourage increased use of stoves and hence more efficient use of fuelwood does have an important role to play, and this accounts for 1.31 bn Frw in scenario 2, rising to 2.48 bn Frw in scenario 3. Wood is the main source of fuel for cooking for 90% of the Rwandan population and deforestation is one important cause of soil erosion. A case can be made for improved communication as promoting national cohesion, and the road network as being an important part of this. However, if this were an important factor behind expenditure on roads, then the rural road network should feature much more strongly.

400. Road rehabilitation in Rwanda has been costed at $350,000 per km. Clearly actual costs are dependent on the terrain, the type of road, and costs of labour and material inputs. There are limits on the validity of international comparisons. However, the World Bank has undertaken a comparison of international road costs in 40 countries, in the second half of the 1990s, which show an average cost for rehabilitation of paved roads of $214,000 per km. The range is between $45,000 and $700,000 with a median of $183,000\textsubscript{143}. Rwanda’s costs are above the average and median, but are by no means the highest in this survey.

401. All the international evidence indicates that rural infrastructure is an important component of accelerating growth, particularly in a predominantly rural economy. It has to be part of a package that includes an enabling environment for private sector activity.

402. None of the studies cited above give much indication of the time frame within which road improvement and electrification could be expected to have an impact on poverty indicators. The quantitative work is done over a ten to twenty year period. It is likely that the effect on transport costs would be relatively quick, but that the second round growth effects could take considerably longer. Some thought should be put into identifying intermediate indicators (not input or output indicators, but perhaps enterprise starts, or qualitative surveys) to follow through on the impact of the public sector investment.

403. In conclusion, it seems likely that investment in economic infrastructure is economically profitable and an important pillar in the government’s growth strategy. It should also increase the income of farmers producing for both the domestic and export market. Depending on which roads are proposed for rehabilitation, by increasing physical access, this expenditure could contribute to the government’s targets in health and education. It is difficult to say how much of the budget should be allocated to this. Like health, the road network could probably absorb as much expenditure as was given to it. What is needed is much clearer analysis of the benefits of this expenditure, both from a strictly economic perspective, including direct and indirect effects, and in terms of social benefits.

\textsuperscript{143} Archando-Callao, Rodrigo, Roads Works Costs per Km, World Bank, 2000.
404. A number of major questions, however, arise about transport costs. One is the relative impact of public expenditure and reductions in fuel taxes on transport costs. The second is the importance of the very lowest level of the transport system in imposing costs (including time costs) on producers who wish to market their output. Relevant issues include local tracks, intermediate means of transport, and the competitiveness of transport markets (which some studies have found to be a major reason why African transport costs are higher than South Asian ones). Finally, most of the transport costs of imports and exports are incurred outside Rwanda, and the government is interested in the prospects for improved international rail links. These are not included in the PRSP. Finally, there is a need for close linkages between the export strategy and transport investment. For instance, there is no point investing in a tea factory without a suitable road. There has been some discussion between the government and private investors about the appropriate sharing of the burden between public and private sectors here.

405. Bearing these in mind, the emphasis on the reduction transport costs does seem to be justified in the context of the PRSP’s overall emphasis on agricultural commercialisation. Rwanda is landlocked and densely populated and it makes a great deal of sense to spend money on infrastructure that compensates for these disadvantages. But an open mind is still needed on the best method to adopt.

The health sector

406. An important element in reducing poverty is improving the health of the population, and one major factor in this is improving the population’s access to effective health care. The issue of the level of public resources that should be devoted to providing public health care, as opposed to encouraging the development of private healthcare systems, is one that has no definitive answer, and is a matter for heated debate in most developed countries in the world at present. How much Rwanda should be spending on health at its present state of development cannot be answered in the context of this study. The most that can be done is an assessment of the additional expenditures envisaged under the PRSP, in terms of their importance within the overall government approach to health care, and the priorities identified by the population and the government.

407. National data indicate that both adult and child health have in Rwanda are now below the African average, having deteriorated since 1994. Health certainly appears quite high on communities’ priorities. Chronic illness is the 6th in the list of priority problems144 and health is the second sector after agriculture based on a sectoral analysis of problems identified in the NPA. Measures for prevention and cure of disease come after various agriculture, security and education strategies in communities’ own assessments of priority strategies. Currently 6% of total public expenditure goes to the health sector in Rwanda. Four of the seven targets included in the PRSP are directly or indirectly (population growth and fertility) to the health sector.

408. According to the initial analysis of the EICV, the incidence of illness varies considerably by region. Incidence is lower in Kigali, which might be expected, but is also considerably lower in Gisenyi than in other parts of Rwanda. On average, incidence of illness and injury increases slightly for the lower quintiles (strikingly, given that the self-reporting bias in illness data tends to work in the other direction), but there is variation within regions on this. The percentage of those ill who consulted health personnel varies

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144 Though this is identified by only half as many communities as a priority as insufficient land and lack of work.
much more strongly according to consumption quintile, with the poorest half as likely as the richest to consult health personnel, for men, and for women this falls to a third.

409. Doctors and nurses are the most likely persons to be consulted, but doctors are much more likely to be consulted by those in the highest quintile. Cost is the main factor determining use of the health system. Overall, the impression of the Rwandan health system is that quality may be higher than in some neighbouring countries, but the system of user charges deters use given the prevailing very low income levels.

410. The programmes within health that have been identified as particularly high priority within the PRSP are malaria and HIV/AIDS prevention and support to health mutuelles and animateurs. The second scenario increases the recurrent costs in the budget for health by almost 60%, all of which will be disbursed at provincial level for drugs, bednets, animateurs, mutuelles and support to preventive health care at local level. This is a much greater disbursement at provincial level than appears in the baseline budget, and must reflect the process of decentralisation, but it does raise questions over the capacity of the local structures to handle this level of financial flows. There is a fairly small increase in development expenditure towards rehabilitation and equipment. This goes up substantially in the unconstrained scenario, where the development budget more than doubles. Again this is on the rehabilitation of health centres and district hospitals. The increased funding for basic health services at local level included in scenario 2 rises, and there are also funds for higher salaries.

411. Animateurs are one of the main channels of dissemination of preventive measures. Mutuelle schemes, a form of health insurance, are being piloted in a number of districts, but involve prepayment for health insurance for a year in advance. Given that one of the main deterrents to use of the health system is cost, this may provide a useful element of cost recovery, and may increase access to some of the better-off households, but there will have to be careful analysis of the results of the pilot schemes, before the impact of this on increasing access of the poor can be assessed.

412. There is a range of gender concerns related to health, a few of which we discuss here. At the most basic level, women can be expected to need health services more than men because, in addition to ‘general’ illnesses, they have greater needs than men in respect of reproductive health. The HIV/AIDS pandemic increases the imbalance in the need for health care, as women are both biologically and socially more liable to become infected. They also tend to bear the main burden of caring for those who become infected. The above considerations apply both in Rwanda and beyond. Within Rwanda, there is further evidence of disproportionate female need for health services in the EICV, which found that 57% of people who had been ill or injured in the recent past were female. Finally, Rwanda has exceptionally high levels of maternal mortality (1,071 per 100,000) when compared with most other countries in the region.

**Malaria**\(^\text{145}\)

413. Malaria has been the leading cause of morbidity in Rwanda since 1991, estimated at 49.89%, and of under-five deaths, estimated at 34.8%. In 1982 its rate of incidence was 3.5%. By 2000 it had risen to over 56%. It was responsible for roughly 50% of all deaths in hospitals in 1998. In Rwanda generally the treatment of malaria is neither

\(^{145}\) This section draws heavily on information in working documents of the Malaria Technical Working Group, Minisante.
The poverty impact of the sectoral outputs financed by the increased expenditures

efficacious nor timely, the consequence of a combination of lack of skilled personnel, public awareness leading to poor treatment-seeking behaviour, of drugs and diagnostic equipment in health facilities, and a rise in levels of resistance to drugs such as chloroquine [50%] and sulfadoxine-pyrimethamine [86% in sentinel sites]. In terms of cost of treatment, current statistics are lacking. However, in 1995 it was estimated that in 1995 the direct cost per episode of malaria was US$2.09, while the indirect cost was over US$5.00. With a population of roughly 8 million people each suffering an estimated 2.5 episodes per year, malaria-related medical costs represent an enormous financial burden to the country.

414. The use of insecticide-treated bed nets has been constrained by lack of awareness of malarial transmission as well as the advantages of using them. Although use of bed nets has increased in recent years, only 7% of households nationwide and less than 3% of rural households possess at least one net. Besides lack of awareness, high levels of poverty and the absence of commercial outlets for nets in the predominantly rural country constitute significant barriers to their use. Many rural people are unable to purchase them or, where purchase is possible, re-treat them.

415. There is evidence from other African contexts that support to bednet programmes can lead to very dramatic reductions in child mortality146.

416. As well as the direct cost to households of malaria in terms of increased health expenditures, there will inevitably be costs in terms of days work lost. The EICV contains some evidence on days lost to illness, which has not been fully analysed, and, in any case would not give information on impact of specific illnesses. However, there has been work done at an international level on the impact of malaria. When all the effects of malaria on quantity and quality of work time are taken into account, it is estimated that a 10% reduction in malaria is associated with a 0.3% increase in economic growth. An important aspect that is not covered by this type of study is the positive impact of women’s time of malaria prevention, compared to their potential role in family care. Another study, by McCarthy et al. 147, found that for Rwanda the elimination of malaria would increase economic growth by 0.9%. The cost of providing 1.5 million bednets free is estimated at FRW 3 billion. If this were to reduce malaria by 10%148 then it could increase GDP by around FRW16 billion annually, which is a very good return, if the programme is properly implemented.

417. These measured economic costs should be added to the costs in terms of distress caused by illness, and the impact on human development outcomes as reflected in the Millennium Development Goals.

HIV/AIDS

418. The AIDS pandemic has had a major impact on revenue generation, economic growth and poverty throughout Africa. At the macroeconomic level it is estimated that annual growth per capita in half the countries of sub-Saharan Africa falls by 0.5% to 1.2%, in direct proportion with AIDS. At the microeconomic level, households in the worst countries react to the pandemic by reducing expenditure on food and other essential

146 Net gains,
148 A study done in Gikongoro showed that the introduction of bednets reduced the incidence of malaria between 10-16%.
needs.\textsuperscript{149} As noted above, HIV/AIDS also has a clearly gendered face, which will affect the economic and social impacts.

419. The general prevalence of HIV/AIDS among adult population in Rwanda is currently estimated to be 13.7%, with the country being one of the 10 worst hit in sub-Saharan Africa. However, disaggregated data shows that between 1996 and 1999 infection rates stabilised in urban areas whereas in rural areas they rose. For example, in Bilyogo (urban) infection rates fell from 37.2% to 17.7%, while in Nyagatare (rural) they rose from 5.6% to 19%. Women are more affected than men in the different age groups, especially those aged between 15-49 years. It is currently estimated that approximately 40,000 children are born to HIV sero-positive mothers annually with a transmission risk of more than 20\textsuperscript{.150}

420. An investigation at four health centres\textsuperscript{151} reveals that:

- On average people living with HIV/AIDS visit health facilities 11 times a year, while the rest of the population visit only 0.3 times.
- Average annual expenditure on health care for people living with HIV/AIDS is US$ 63, while for the rest of the population it is US$3 per household on average.
- Less than 30% of households affected by HIV/AIDS are able to pay for health care using their own resources.

421. Addressing the prevention and curative needs associated with HIV/AIDS in Rwanda is clearly a huge challenge. Very few countries in Africa are having any significant impact on the rates of infection, or are able to afford treatment for any but a small number of those affected.

422. It is difficult to assess the returns to additional expenditure on healthcare as envisaged in the PRSP, without undertaking an extensive analysis of existing returns to expenditure in this area, and the implications of not undertaking the specific activities concerned. This is particularly true for the substantial sums allocated to rehabilitation and equipment in scenario 3. For areas such as HIV/AIDS prevention and treatment, there is an obvious need, but the effectiveness of further expenditure depends on it being within a well-developed national strategy for combating the disease.

423. There is, however, a need for a full assessment of the health sector, in the light of the priorities and objectives set out within the PRSP, to examine whether the funds that are available are being best deployed to achieve these ends. Further thought could also be given to the health targets included in the PRSP. There is a strong case for including a target on access to HIV/AIDS support services. There appears to be a disconnect between the activities proposed under the additional scenarios and the health targets included in the PRSP. The targets relate to the ongoing activities of primary health care, and in particular, mother-child care, whereas the additional activities are more linked to health insurance and preventive approaches. There will be need for monitoring the link between outputs and outcomes in this sector.

\textsuperscript{149} See SAFCO, Bulletin Trimestriel de l’Equipe Inter-Pays ONUSIDA pour l’Afrique de l’Ouest et du Centre, No.04, octobre-décembre, 2001, p.2

\textsuperscript{150} Presentation sur la façon don’t les programmes actuels soutenus par le PNUD integrent le VIH/SIDA. Atelier du 18 au 21 juin, Johannesburg.

\textsuperscript{151} Equipe Inter-Pays ONUSIDA pour l’Afrique de l’Ouest et du Centre, Juin 2002.
Primary school textbooks
424. The choice of primary school textbooks as a priority activity in Rwanda has to be seen in the context of the overall situation of primary school education. Primary school education is seen as the most critical part of basic education in Rwanda. The country is seen as suffering from a shortage of well-educated people, a shortage that was evident in the early 1990s, and compounded by the effects of the genocide. The percentage of the population which has completed primary education is only 31% overall, according to the EICV. There is a very clear relationship between completion of primary education and consumption quintile. Only 15% of the lowest consumption quintile has completed primary education, rising to 53% for the highest quintile. Figures from the region indicate that completing primary education may increase future incomes by about 40%\textsuperscript{152}.

425. There has been a big push towards increasing enrolment rates in primary education in recent years, consistent with Rwanda’s aim to achieve Universal Primary Education (UPE) by 2010. Gross enrolment rate is 99.9% and net enrolment is 73.3%. However, this promising picture is marred by high drop-out rates and repeat rates. The drop-out rate in Rwanda for 2000/2001 is 14.2% according to administrative information from Mineduc. Evidence from the EICV shows that the main reasons for drop-out at primary school level are “lack of interest” (26.69% for girls and 33.43% for boys) and “cost” (27.29% for girls and 25.13% for boys). The QUID survey indicated that 50% of children in primary school are unhappy with their educational experience and for 91.5% this is related to absence of and quality of textbooks with very little difference between genders. The drop-out rate is slightly higher in the poorer than the richer quintiles.

426. There is substantial expenditure on education in the baseline expenditure in the PRSP. Education accounts for 18% of total expenditure, and just over half of that is on primary education. This includes two large primary education projects, one funded by the ADB and the other by the World Bank. Almost all the additional expenditure under scenario 2 goes towards primary textbooks, with a small allocation towards rehabilitation and equipment in primary schools. The textbook programme is intended to start a rolling programme of provision of textbooks, one for each of six subjects per three students, so that at the end of three years each student would have six books. In the unconstrained scenario, the additional expenditure envisaged increases by a factor of almost 7. The largest amount here is still on textbooks (this has more than doubled to increase the rate of implementation). Funds are also allocated to recruitment of more teachers at primary school, and to support non-wage costs.

427. One issue here is how far the public provision of primary textbooks replaces private purchase, in which case the net effect of the spending is to transfer money to families with children in school rather than to increase the number of textbooks in schools. Even if textbooks are currently scarce, the development of a private market might be possible.

428. However, about FRw 4 billion is allocated each to secondary education and higher education, neither of which are identified as priority activities. Mineduc argues the need for this in a number of ways: first, the need for secondary education as a part of supply of primary school teachers; secondly, the importance of access to secondary school as a motivator for participation in primary education; and finally as a contributory to overall growth in the economy. The case of investment in tertiary education is made in terms of

\textsuperscript{152} Mineduc submission to PRSP team
provision of teachers, and the role of higher education institutions in terms of developing applied research and undertaking advisory work in areas relevant to poverty reduction.

429. It is important in this context to distinguish the need for increased tertiary education from the need for increased public funding. Private sector demand for some forms of tertiary education in Kigali is proving very substantial. Given the fiscal constraints in Rwanda, there is a need to be open-minded about the possibility of funding expansions of tertiary education mainly from private sources. At least the principle of a graduate income tax or student loans would seem just in this context. It would also be desirable that secondary and higher education should be expanded in a way which is accessible to all members of society, in particular women, who are currently underrepresented. It is also important to ascertain that incentives are adequate to ensure that the public benefits of increased education (on the basis of which public investment is being justified) are actually realised, and not simply captured for private benefit.

430. Estimates of rates of return to education are often subject to conceptual confusion, but the most recent evidence is that in Uganda each year of primary education adds about 5% to an adult’s income. International evidence shows that rates of return to primary education rise in the context of agricultural transformation. Secondary and tertiary education may have higher private income effects but at greater cost. However, from a poverty-reduction perspective, the private returns to tertiary are almost irrelevant, because the beneficiaries are rarely poor. The poverty justification of spending on tertiary education is the externalities generated, for instance because educated people provide better public services or government or set up businesses that generate employment. While these externalities may be important, there is very little hard evidence on them.

431. Primary education is identified as a priority problem by communities, but in terms of physical infrastructure such as classrooms and primary schools, rather than quality of teaching. The more general problem, lack of knowledge and information, comes third in the overall list of priority problems, and improved primary education undoubtedly will respond to elements of this, as will adult literacy and skills training (see below).

432. Primary education is undoubtedly very important in increasing people’s opportunities and feeling of empowerment. It can also be an important instrument in improving social cohesion. The surveys undertaken as part of the preparation for the PRSP undoubtedly identify quality of teaching as an issue, and provision of textbooks seems a sensible response to this. It is important that the textbook programme is monitored to assess how effectively it is being implemented and to see if it has an impact on drop-out rates.

433. Increasing net primary enrolment to 100% by 2015 is one of the targets included in the PRSP. Communities also identify the area as a priority problem. The PRSP puts forward a case for focussing on improving the quality of primary education in Rwanda as a way of achieving this. Again, it will be important to monitor both outputs and outcomes in this area, to ensure that the activities included in the additional expenditure scenarios achieve the poverty reduction impact envisaged. There may also be a need for expanded classroom construction as pupil numbers increase. However, there are very strong arguments for seeking low-cost solutions with community participation, as major classroom investment can be very expensive.
Skills Development

Training programs are developed by Mijespoc in Youth Training Centers, but less than 2000 persons are trained every year and the training is available only to those who can afford 3000 RwF per term. The training is offered to disadvantaged young people, selected on the basis of a local survey. The PRSP indicates that this programme is impeded by inadequate facilities and the expanded scenarios include funding for rehabilitation of existing centres, a total of FRw 660 million under the constrained scenario and FRw 3.2 billion under the unconstrained scenario.

There are a number of questions that it would be useful to ask about this programme; in particular about the gender profile of participants, the avenues in which they are trained, the success of participants in using the skills they have learned and about whether the cost of the programme excludes the poor. However, the team did not have time to follow up these issues with Mijespoc. The amounts involved are relatively small – 1-2% of the additional development budget – and donors have been found for rehabilitation of centres in the past. Lack of employment is clearly identified by communities as a big problem, and 10% of communities did identify technical and artisanal training as a priority strategy.

Training programs are developed by Mijespoc in Youth Training Centres, but less than 2000 persons are trained every year and the training is available only to those who can afford 3000 RwF per term. The activities should reduce the poverty levels of those participating, and could play a role in reducing marginalisation of certain groups within the community.

Adult Literacy

The EICV shows that 43.66% of the adult population (aged of 15 or more) in Rwanda is illiterate, which breaks down as 48.6% of women and 37.5% of men. 51.9% of rural population declare that their community has benefited from an adult literacy program and that an average of 39 adults per rural community were taught during them. This could be one factor explaining why illiteracy is higher in urban than rural areas.

Mass education, which the adult literacy programme comes under, is the responsibility of Minaloc. The proposed increase in expenditure for adult literacy programmes is almost double the existing funding. At present only FRW 30 million go to the provincial level, all in recurrent budget, and under the expanded scenarios this would increase to FRW 500 million. As with so many other programmes included in the expanded scenarios, this raises the question of capacity at the provincial level. It might be more realistic to phase this type of programme in gradually, but concerted and high-profile campaigns in countries such as Mozambique and Tanzania have had impressive results which indicate the benefit of such an approach.

The additional funding appears to be primarily for provision of pedagogical materials and training primary school teachers to teach adult literacy.

Increasing adult literacy is recognised as an important element of empowerment for marginalized populations, and could have significant productivity impacts in the context of agricultural transformation. A recent study of a number of programmes that integrate elements of skills development with literacy programmes achieve much higher levels of
commitment than stand-alone literacy programmes, particularly with males\textsuperscript{153}. However, these programmes tend to be more expensive to run. A more gradual phasing in of additional expenditure could also allow for comparison of different types of approaches, to increase overall effectiveness in the medium term, but with the disadvantages outlines above. Whatever approach is chosen, given that illiteracy is concentrated amongst women, rural poor and increases with poverty level, expenditure in this area seems an important and urgent priority if agricultural growth is to be the route out of poverty.

\textbf{Gacaca}

441. As of the end of 2001, there were 107,000 people in prison in Rwanda, awaiting trial for genocide related trials. Rwanda’s judicial system lacks the human and financial resources to try even a small portion of those detained. Beyond shortages of financial resources, the genocide effectively purged the vast majority of judicial officials. Faced with the pressing need to demonstrate to survivors, prisoners and the international community alike that justice is being served, to reduce the enormous judicial burden on the State and to liberate innocent prisoners, the Rwandan government has decided to re-introduce Rwanda’s ‘gacaca’ process.

442. Gacaca is the traditional method of resolving disputes in Rwanda, whereby village elders pass judgement. In the modern update, local communities are electing judges for 11,000 gacaca courts, at four levels - cell, sector, district and prefecture – and these courts will judge all but those accused of the most serious of crimes committed during the genocide. In October 2001, 254,000 judges were elected, training of these judges in basic legal matters has taken place and the first trials started in late June 2002, in two prefectures.

443. The need for some resolution to the outstanding issue of war crimes is clear. The current situation, whereby prisoners have been detained for up to eight years, has both economic and political repercussions.

444. From an economic perspective, the continuation of large numbers of untried prisoners imposes considerable costs. There is a direct cost to the prison service. Prisoners’ households also bear a considerable cost, both in terms of loss of labour power, but also in terms of the time that prisoners’ wives spend travelling to and from the prisons to visit and feed their husbands. It is reasonable to assume that some prisoners will be found innocent and others will be freed on the basis that eight years is sufficient sentence for their crimes, thus reducing both prison and family costs. Gacaca should also return labour resources to the rural areas (see discussion under public works).

445. More important is the need to address these issues for political stability. There appears to be considerable community support for the process. News agency reports indicate that there was almost 90% participation in the election for judges for the gacaca courts. If successful, the gacaca courts may form the basis for other community level regulation of key initiatives, such as the implementation of the land act. The gacaca process should also help clear the backlog in the judicial system and allow the strengthening of the formal centralised system to address issues such as the development of an effective legal framework for responsible private sector activities.

446. Gacaca is regarded as sufficiently important that it is included in the baseline development budget. An amount of 1994 million FRw is included at the central level in the 2002 budget. This is the third highest allocation for any of the priority activities in 2002, only surpassed by demobilisation and economic infrastructure. However, in June 2002, donors in Kigali were presented with a detailed budget for gacaca which was considerably higher than the original budgeted amount.

447. Gacaca judges are unpaid volunteers. However, allowances have to be paid to cover their living and travelling expenses, and the proposal covers items such as provision of bicycles for judges at courts above the cellule level. In addition, the day-to-day logistics of the courts – stationery, proper reporting mechanisms, etc – all have to be covered. Although there is likely to be continued discussion over the appropriate funding levels for gacaca (donor assistance will undoubtedly provide much of the financial resources) the end result is likely to be an increase in the overall budget figure for 2002, and beyond. For political reasons, however, this is an expenditure that cannot be delayed.

Demobilisation

448. An effective demobilisation programme, which allows for full integration of former combatants into society, is seen as a critical element in achieving good governance in Rwanda, along with efforts to promote regional conflict resolution.

449. The demobilisation programme is included in the baseline PRSP recurrent budget, and has the highest allocation of any of the priority activities, Frw 5.9 billion in 2002 (see Table 6.2). This is a one-off expenditure. The government has prepared a project, in consultation with donors, to address the needs of demobilised soldiers, and this is being funded by a World Bank credit, currently being negotiated.

450. Some demobilisation has already taken place in Rwanda. A total of 18,692 RPA soldiers were demobilised between 1997 and February 2001. This process was cofinanced by government and various donors through a UNDP-administered fund. A significant number of these soldiers were referred to employment and education opportunities by the Rwanda Demobilisation and Reintegration Commission (RDRC). However, the programme had internal technical and management problems, and was hampered by insufficient financial resources. In response to this, the second phase of demobilisation is being redesigned. It is intended to cover 20,000 RPA soldiers and 25,000 members of armed groups returning from neighbouring countries. The programme is also expected to support those soldiers covered under phase 1 of the demobilisation programme who remain socially and economically vulnerable and to provide reinsertion assistance to 15,000 ex-FAR who returned to Rwanda but were not incorporated into the RPA.

451. The programme proposed will provide a basic needs kit to ex-combatants of food, seed and tools and basic household items, costing about Frw 50,000 each, in cash and kind (approx. $120). In addition RPA soldiers will receive recognition of service allowance, ranging from $330 to $1100 according to rank. This would be staggered in two instalments. Ex-combatants would receive a grant of Frw 100,000 to assist in reintegration, regardless of affiliation. The reintegration and reinsertion programmes

154 There is a small amount, 30 million FRw, included in the provincial budgets, but other than that, gacaca is a centrally funded activity.
amount to 2/3 of the overall programme cost. An additional 10% is allocated to assistance to special groups, in particular to the disabled.

452. A successful demobilisation programme is an important element in achieving greater political and social sustainability in Rwanda. It is clear from the first phase of demobilisation, where it is estimated that up to a third of former soldiers were in an economically vulnerable situation in 2001, that the process needs a great deal of technical and financial support. Demobilisation also has the potential to affect the rural economy significantly, either positively or negatively. Ex-combatants’ payments could represent a significant one-off inflow of resources. However, the ex-combatants themselves swell the size of a workforce that, in some areas, is seriously underemployed. Demobilisation will also result in a marked shift in the gender profile of rural areas, which could have negative social results, including in levels of public and domestic violence, if not properly managed. This latter issue is discussed in more detail under labour intensive public works. There is a potential synergy between these two activities that should be explored.

453. There has been international analysis of the factors that are likely to affect the risk of conflict in societies. Collier and Hoeffler find that 30% of variation in conflict experience can be systematically explained by four factors: the level of education and poverty, the degree of dependence on natural resources, the degree of ethnic fractionalisation and the level of democracy. Countries with little education, high dependence, partial democracy and a high level of ethnic dominance are at most risk of conflict. Some of these factors are not immediately amenable to modification through policy, and some, such as the dependence on natural resources, make take considerable time to change significantly. However, this analysis does indicate that success in reducing poverty and increasing education standards may be an important factor in achieving greater political stability in Rwanda. It also indicates that, since 70% of variation cannot be explained systematically, the appropriate policy for peace in post-conflict societies is likely to be highly context-specific.

454. Collier has undertaken analysis of the reconstruction process in Uganda and as part of this has examined the demobilisation process there. Access to land by demobilised soldiers was a critical element in reducing the potential disruption caused by the reintegration process. Those soldiers who reported that they did not have access to land prior to demobilisation were 100 times more likely to commit crime than the average Ugandan, once demobilised. The two overall policies that Collier indicated were most important in supporting the demobilisation process were targeting of growth on the poorest region and the expansion in education. The Ugandan experience would seem to indicate that successful reintegration of demobilised soldiers into society is dependent on how well the demobilisation programme is implemented, but also on success in programmes such as clarifying land rights and education.

455. One final point: at this stage, the number of ex-combatants who will be eligible for the programme is an estimate, which could be affected by recent political agreements reached in the region. Numbers should be monitored to assess whether the size of the programme is increasing or decreasing significantly.

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Emergency roofing and water harvesting kits programme

456. One of the outcomes of the large-scale population movements which have characterized Rwanda over the last decade has been a lack of housing in certain areas of the country as Rwandan expatriates have returned and others have moved out of the country and then returned, often spending time in temporary camps. This situation may be further exacerbated by demobilization of parts of the Rwandan army.

457. The lack of shelter was one of the main areas examined by the Brookings Task Force, which worked in Rwanda in late 2001. They estimate that 800,000 “old caseload” refugees returned in 1994, 1 million Rwandans were internally displaced in 1994, 1.4 million refugees from the conflict returned in 1996-97, and another 600,000 Rwandans were displaced in Gisenyi and Ruhengeri as a result of internal insurgency. This is all from a population of around 8 million.

458. There was a considerable inflow of funds to address the immediate resettlement and reintegration efforts, and 177,000 houses were built by 1999. However, there has been little funding for shelter problems since 1998. This is partly a result of the withdrawal of emergency focused agencies and partly may have been affected by a degree of donor distrust of the government’s imidugudu policy.

459. Traditional household surveys usually cannot provide estimates of the extent of homelessness or inadequate housing as, by definition, they focus on those who live in ‘dwellings’. A survey carried out by MINITERE in October 2001 indicated that 192,000 households were living under plastic sheeting. Two thirds of these were living in the provinces of Kibungo, Ruhengeri and Gisenyi. The Brookings task force report indicates that these families are amongst the poorest and most vulnerable in all Rwandan society and include female or child-headed households and the handicapped sick and elderly, who do not have the means and capacity to improve their housing on their own.

460. At present the baseline development budget includes a figure of FRw 832.5 million for shelter provision. This reflects two projects, funded by UNDP and the Netherlands government for reinstallation and reintegration of displaced populations in Gisenyi and Gishwati. The additional scenarios propose an extra FRw 22667.5 million on shelter provision. The two scenarios contain the same overall amount, but in scenario 2 this is spread over the whole three years whereas scenario 3 is front-loaded. A donor meeting is proposed to address the issue of funding the remaining shelter needs. This is a one-off expenditure. The maintenance and labour costs are the responsibility of the family to be housed.

461. This is one area where the costing has been substantially reduced since the project was initially put forward. Shelter will be addressed through the provision of roofing kits and water harvesting technology.

462. Provision of housing will have a direct impact on poverty, through improving living conditions. Although rural shelter is not directly one of the MDGs, it could be expected that an improvement in housing would have an impact on health, in particular respiratory

158 This is a villagisation policy which encompasses not only returnees but the entire rural population. It is based on arguments for improved service delivery, more rational land distribution, better security and a more promising basis for agro-industrial development. This is a voluntary process, but the erection of new housing in rural areas outside of this framework is prohibited.
The impact of increases in public expenditure on poverty in Rwanda

diseases. It is also likely to target many of those considered amongst the poorest in the community. The NPA\textsuperscript{159} showed that, when people were asked about the characteristics of the very poor, lack of housing was second only to begging as a determining factor. Having said this, provision of housing did not rank highly as a solution to poverty in the discussions reported in the NPA. One possible interpretation is that housing is important but only for a subset of households.

463. Housing provision is uniquely to have a major impact on growth, though it may make it more possible for the recipients to earn their own living. There is also no a priori reason to believe it will have a negative effect on the environment and may even have a positive effect if it encourages families to have greater ownership and responsibility for their surroundings.

464. The main reason for implementing improved shelter as rapidly as possible, other than a basic human need, has to be the impact on social and political stability and cohesion. The Brookings report declares that human settlement is “a vital function of sustainable peace” and makes much of the role it could play in establishing lasting governance structures at different levels in the country. Without permanent housing families are marginalized from social and economic processes. This is confirmed by examination of the EICV results. Nowhere in the survey is there any indication of families living under plastic sheeting. The question does not appear to have been asked. Yet the quick housing survey undertaken by the ministry indicates that around 3-4% of the population may be in this situation.

465. Obviously the macroeconomic impact of this expenditure has to be taken into account, and the feasibility of the most accelerated time frame. MINITERE administered the building of 8,000 houses in three months in 2000, in a limited area of the country, and are confident that they can implement the larger programme, given funding.

**Sector strategies**

466. The development of sectoral strategies to align the plans of the line ministries with the priorities and targets identified in the PRSP is a critical step in the implementation of the PRSP. Yet only one ministry, Minagri, explicitly identifies this as an activity in its baseline expenditure scenario. There is no mention of this in the expanded scenarios.

467. It may well be that ministries regard the development of strategies as part of their regular activities and therefore do not enter it explicitly into ministerial budgets. However, it could also be that the link between the PRSP and line ministry plans and budgets is not fully comprehended and/or accepted. All ministries need to bring their policies and strategies in line with the nationally agreed poverty reduction targets, and become used to justifying their projects and programmes in these terms. This may well require technical support and capacity building to do this, which should be provided through the MTEF process managed by MINECOFIN.

**6.3 PUBLIC EXPENDITURE – THE OVERALL PICTURE**

468. The previous section has examined the individual elements of the priority programmes identified in the PRSP. In particular it has tried to look at what the implications might be for poverty reduction if the activities included under the additional

\textsuperscript{159} Rapport d’Evaluation Participative de la Pauvrete au Rwanda, October 2001.
scenarios did not go ahead. In some cases the benefit has been clear, in others it has been more difficult to assess how much, if any, additional expenditure is desirable. This has been partly because of lack of detailed information about how the proposed activity would be implemented, and in some cases, such as road maintenance, a lack of access to the analysis that appears to underlie the planning decisions. Overall, the pattern of expenditure under the various scenarios is broadly consistent with the strategy outlined in the PRSP.

469. For many of the activities that are included under the expanded scenarios, particularly those that cover additional recurrent expenditure, the implementation level is the province. This is in keeping with the decentralisation process in Rwanda. However, this raises significant questions over the capacity to use this level of additional funding effectively at regional level. If this has not been undertaken already, there should be a serious assessment of the institutional capacity to carry out these programmes, and possible additional resources that may be needed.

**Non-priority activities included in additional scenarios**

470. 42% of the additional recurrent expenditure under scenario 3 is allocated to activities that are not included in the list of priority activities in the PRSP. The figure for the development budget is not so startling, 17%. How does this arise?

471. A large part of this additional non-priority expenditure is allocated to health and education activities. There is some support to the mining sector, and to commerce and trade activities. There is also some small amount to soil conservation, which will be discussed below. There is ambiguity in identifying some of the additional recurrent expenditure in the health sector as non-priority.

472. Much of it is going to primary health care in rural areas, but not to the specific activities identified as priority in the PRSP. If there were time to undertake more in-depth analysis of what these resources were intended for, it could be that some significant part of this should be regarded as priority. This would still leave expenditure on health care at the centre, which is more difficult to justify in terms of benefiting the predominantly rural poor. This is not the case for the additional non-priority recurrent expenditure in education, which is clearly identified as for the secondary and higher education sectors. As has been discussed above, Mineduc made a case for this as contributing either to poverty reduction or to the sustainability of effective primary education, both plausible on the face of it, perhaps particularly the second argument. (though primary school teachers are not expected to be university graduates).

473. As is discussed below, one of the problems in focusing on the eleven priority activities identified in the PRSP is the interdependence of various elements of the public expenditure programme. Yet priorities have to be set, and clear criteria for this are included in the PRSP document. If, when it came to developing the various budget scenarios, the need was felt to include additional activities, then perhaps the priority activities should have been revisited.

474. The apparent discrepancies are much smaller as far as the development budget is concerned. Here the biggest additions are for provision of water and purification facilities for schools and hospitals in Kigali and in rural areas, and feasibility studies for railway and port development. All of these activities could well have a significant impact on
health and wellbeing, and economic growth, but they have not been explicitly identified as key to the implementation of the PRSP.

475. These discrepancies between stated priorities and budgetary allocations reinforce the importance of undertaking both realignment of ministry strategies, and development of budgets within a sectoral MTEF framework, both of which are focussed on implementation of the PRSP. Rwanda is in the process of undertaking these activities. The development of an agricultural strategy is now underway. It is fair to say that most countries that have developed PRSPs have had considerable difficulty aligning their budgets with the analysis contained within the PRSP document, and, despite the concerns raised above, Rwanda has probably gone further than many in developing a framework for addressing this.

Activities which should be given priority

476. In addition to the eleven priority activities identified in the PRSP, there are a number of issues that should be tackled in support of the PRSP strategy. These are mentioned in brief, to give an indication of areas that may well need additional financing over and above the amounts included in the PRSP budgets.

477. Implementation of Land Act. As the Brookings process report indicates, land is the most important asset for most Rwandans and access to land has been decreasing as a result of excessive partitioning of agricultural plots in response to population growth. This is a problem for economic sustainability, environmental sustainability, and the achievement of reasonable growth rates in agriculture. Their importance goes beyond this, however. To quote the Brookings Initiative in Rwanda report directly (p.23), “the significance of the land tenure issues for durable peace cannot be overemphasised”. These are believed to have been an important factor in the genocide, and population movements after the war combined with issues of compensation arising from land used in the imidugudu process mean that land disputes are still an important cause of social conflict. 80% of cases coming before prefects are concerned with land.

478. The government is fully aware of the sensitivities in this area, and have developed both a Land Policy and a Land Act, which have been sent to government for review. Plans are being made to implement the Land Act, and there is some funding in the baseline/ MTEF for this, specifically for dissemination, information and sensitisation. However, until there are full details of any necessary cadastral surveys, and the nature of any conflict resolution process, it is difficult to assess how adequate this will be. There has been discussion of using the gacaca system to address land conflicts, but it will be difficult to implement this until there have been major advances in the genocide trials. The initial stages of the Land Act implementation are likely to require much more in the way of resources than have currently been budgeted. The initial stages are likely to be followed by the need for considerable investment in conflict resolution as a number of people indicated to the team that many Rwandans have accepted provisional solutions to land issues while waiting for the Land Act to be passed. It is critical for continued political stability that the implementation of the Land Act is properly funded.

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160 In this section, the term budgetary allocation is used for conciseness, but the reader should remember that expenditure under the additional scenarios is heavily dependent on donor financing.

161 This does not include core areas of government such as public expenditure management or civil service reform that are also important for implementing the PRSP strategy and may also require some financing, through budget support or other means.

162 It is difficult to identify this absolutely, but the amount seems to be around FRw 301 million.
479. **Family planning.** The high population growth rate is often cited as an important factor contributing to pressure on land and environmental degradation. Take-up of contraceptive services is low, though evidence differs as to whether this is because of lack of access to services, or lack of demand. The EICV indicates that there is a lack of demand. However, the PRSP quotes the DHS as showing that a majority of women do not want to have children in the next two years. The view was strongly expressed to the team by a USAID advisor that there was a strong suppressed demand for family planning services, but insufficient access. There are plans to mainstream family planning issues into adult literacy courses and health information, but this is an area that may need a more pro-active approach, which could involve more resources.

480. **Soil conservation.** As discussed elsewhere in this report, there has been considerable underinvestment in soil conservation in recent years in Rwanda. It is hoped that some of that will be remedied after land tenure issues have been addressed. The labour-intensive public works programmes are likely to include activities such as terracing, which will have positive impact on soil conservation also. However, given the severity of the problem in Rwanda, there could be considerable economic benefits from a community based information, sensitisation and monitoring programme. This would not necessarily cost a great deal, but should perhaps be included in priority actions in future revisions of the PRSP, and included in budgeting. In principle, the activity might also form part of the normal work of the extension service.

481. **Water supply.** Although water supply was included in the PRSP scenarios, based on the public expenditure review carried out in the sector, there was evidence of contrasting views on the costs of the sector, possibly differing by a very large amount. It is therefore possible that this sector will need more resources than have been estimated.

482. **Issues on interdependence.** However there is also an inherent flaw in examining some of these activities in isolation. The PRSP strategy to achieve high growth rates centres on the agriculture sector. This in turn depends on achieving high levels of production growth, as a result of increased fertiliser use, which in turn is dependent on a reasonable and stable market for farm output. In Rwanda fertiliser is used on commercial crops, so that farmers can cover the cost of inputs from the proceeds of sales. There are a number of elements included in the additional expenditure scenario for Minagri which could play an important role in achieving this, in particular the financing of a seasonal credit fund, and additional expenditure on extension and marketing. However, the additional expenditure on road rehabilitation and feasibility studies may also have an important role in reducing the cost to farmers and local traders of accessing markets. Similarly rural electrification plans could make a big difference in the cost to the private sector in setting up rurally-based processing plants, one possible market for potatoes and vegetables. It is not clear to the team how much coordination there is between ministries on these issues. Minitraco has identified the value of agricultural traffic as one element in planning the next steps in developing the road network, but ideally the two ministries medium-term planning strategies should be closely interlinked within the overall framework of the PRSP.

483. One important element which is much discussed within Rwanda, but does not perhaps get the prominence it deserves in the expenditure plans is the adoption and implementation of the Land policy and Land Act. As discussed above, this is likely to be costly and yet is critical to ensure proper incentives for individual farmers to invest in their land, in particular in land conservation and improvement activity such as terracing and
tree planting. While this is still an ongoing process, and while there is uncertainty over its outcome, this is likely to slow down any process of land consolidation and slow production advances, perhaps not so much for annual crops such as potato, but certainly for perennial tree crops, such as coffee and tea.

484. In summary, most of the additional expenditures proposed within the scenarios of the PRSP can be justified on the grounds of poverty reduction, with the possible exception of some of the high cost development activities that are not included within the priority activities. There are two further steps that have to be taken however. The proposed plans of implementing line ministers have to be examined for the extent to which they are consistent with the PRSP, and to what extent resources are being spent on activities which, for reasons of history or prestige, are being funded at a higher level than is justified within the poverty framework. As discussed above, only Minagri has set aside funds for this exercise. Also, there is need for a systematic examination of the interconnectedness of a number of key activities being carried out by different line ministries, but not in a coordinated manner. Improved coordination could increase substantially the effectiveness of the resources used.
7 Implications for optimal fiscal policy

7.1 THE NEED FOR A MACROECONOMIC CONSISTENCY MODEL

485. The magnitude of the various effects discussed above, as well as the supply-side benefits of the increased expenditures, need to be examined in the context of a macroeconomic consistency model. The macroeconomic scenarios presented by the government in late 2001 as part of the draft PRSP assumed that the current account deficit would be held down; this leads to a severe squeeze on private consumption and private investment. As the IMF team pointed out, these consequences are neither desirable nor realistic. These scenarios have been reworked recently to address these inconsistencies in the base scenario. Training is currently being provided to MINECOFIN staff in macroeconomic consistency modelling, using an approach closely related to the RMSM model.

486. For our purposes, we need a model that is closely related to the macroeconomic consistency models but is enriched in the following ways:

- The real exchange rate can move in response to increased inflows, allowing Dutch disease effects to be included.
- GDP depends on government expenditure.
- The determinants of GDP are disaggregated by sector, allowing different impacts of public expenditure and investment.

487. It will also be of interest to simulate the effects of sectoral GDP growth on poverty.

488. Annex 6 gives the structure of a consistency model designed during the PSIA study for this purpose. Within the scope of the PSIA, there has not been time to explore all the modelling issues fully, but the results nevertheless shed light on the issues involved.

489. Aggregate supply in the model depends on cumulative public expenditure and cumulative private investment; thus, for the purposes of examining the impact of the PRSP scenarios, we treat recurrent public expenditure as having a permanent impact on output. While innovative, this is a reasonable assumption for the expenditures proposed in the PRSP scenarios. Consumption and investment are driven by incomes, and exports are supply determined, leaving imports as the residual in the national-income identity. Inflation (for the overall price level) is exogenous, but the relative prices of traded and nontraded goods are given by the real exchange rate, which in turn determines the nominal exchange rate. The real exchange rate is determined by the ratio of absorption to GDP, and has an effect on exports. Interest and principal repayments are calculated in a simple debt module. On the balance of payments, external financing, imports and exports are included, giving a residual ‘other flows’ which includes off-budget aid.

490. Increases in public expenditure are funded externally, by grants or loans or a mixture. The implications for debt ratios are calculated.
7.2 THE MAIN SIMULATION RESULTS

491. Tables 7.1-7.3 show results for the main run of the simulation model: One of the most striking features of the results is that debt sustainability emerges as a much smaller problem, post-HIPC, than was expected; even in the most expansionary scenario funded 100% by IDA loans, the debt-service-export ratio remains well under control, never exceeding 20%. What this brings home is just how concessional IDA terms are for an economy with a healthy growth rate. Sensitivity analyses in Annex 6 show that the results are most sensitive to the terms of financing; OPEC terms give a much more significant increase in debt service. Even then, we think that the results suggest that if money is well spent, liquidity need not be as grave a concern as has been thought.

492. A simple exercise was conducted to examine the poverty impact. Using the results in Table 7.1, a population growth rate of 2% and a poverty elasticity with respect to per capita consumption of -1.595 (Ravallion\textsuperscript{163} estimates that the elasticity of poverty with respect to per capita consumption is -2.9 multiplied by 1 minus the Gini coefficient (0.45 in Rwanda), which gives an elasticity of -1.59 for poverty.), the poverty headcount falls to 32% of its current level under the baseline scenario, 33% in scenario 1, and 27% in scenario 2.

493. However, one potentially important caveat is that we have modelled a sharp spike in expenditure, where the real value of public expenditure is held constant for five years after the expansions of scenarios 2-3. Given wage pressures in a growing economy, this may be unrealistic and further work could explore alternative trajectories of public expenditure. Another caveat is that the GDP numbers do not capture non-economic benefits nor the unusual extent to which growth in Rwanda depends on agricultural transformation and hence on public action.

494. We do not pretend that the results of the model are at all definitive. We do think, however, that they are suggestive, and that further collaborative work on this kind of model offers the best chance of advancing the macroeconomic discussion in concrete terms.

\textsuperscript{163} M.Ravallion, Growth, inequality and poverty: looking beyond averages, World Development Vol.29 no.11, pp.1803-15
### TABLE 7.1 SIMULATION RESULTS FOR THE BASELINE CASE, SCENARIO 1

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**Notes:**
1. * for simplicity, interest in this line of the table is derived from the case where all new funds are based on loans. It would be lower, and hence the balance of payment better, in the other cases.
2. The percentages in the last six lines refer to the share of new funds that take the form of grants.
3. All magnitudes calculated post-HIPC.
### TABLE 7.2 SIMULATION RESULTS FOR THE CONSTRAINED CASE, SCENARIO2

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**Balance of payments**

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**Real exchange rate**

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**Debt service/exports**

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**NPV/exports**

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TABLE 7.3  MAIN SIMULATION RESULTS FOR THE UNCONSTRAINED CASE, SCENARIO 3

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Balance of payments

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7.3 HOW LARGE SHOULD THE EXPENDITURE PROGRAMME AND THE DEFICIT BE?

495. The researchers were asked to define an optimal level of deficit for Rwanda. Our approach has been to examine the effects of a specific set of proposals for expansions in expenditure. Our analysis illustrates the point that the optimal deficit depends both on the composition and financing of expenditures. We cannot therefore give a single number for the optimum deficit, but rather, an approach to defining a prudent fiscal strategy.

Expenditure and the composition of financing

496. None of the macroeconomic arguments appear to us to be strong enough to warrant turning down free money, and hence the macroeconomic programme needs to be flexible enough to allow for this.. In Rwanda’s situation, it is possible to find good uses for grants, such as imports of life-saving medical drugs, that do very little macroeconomic damage. Capping the overall level of expenditures financed by grants is therefore not warranted, although capping certain forms of expenditure is potentially warranted.

497. For loans, the critical judgement is the likely availability of funds in the future. Given that international assistance is in a state of transition, there can be no definite answer to this question. The balance of the evidence suggests to us that it would be reasonably
prudent to base a borrowing strategy on a significantly higher level of indebtedness than the 150% NPV/exports ratio proposed under the HIPC initiative, particularly if new borrowing is undertaken at IDA terms. Fundamentally, for a fast-growing economy the concessionality of IDA money is so substantial that turning down such funds makes little sense unless there are very serious sustainability worries. We do not see enough evidence of such worries on the basis of the model estimates so far, although further analysis may produce more grounds for concern. Moreover, the case for a temporary spike in public expenditure appears to be well-founded in Rwanda provided that administrative capacity is able to handle the spending.

498. For revenue-funded expenditure, it is possible that there is more scope than has been appreciated for increasing the revenue base by increasing rates of taxation. We have not been able to study this question in detail, but the argument that such increases would be contractionary appears to be spurious if the increased revenue translated into increased public expenditure, and the incentive effects are minimised by the use of VAT and potentially income tax. The very high degree of inequality suggests that increased rates of taxation on commodities mainly consumed by the better-off could produce a benign redistribution of income. The most serious objection is the possibility that increased rates of taxation could increase smuggling. We also see more potential buoyancy in the tax system than was expected; we do not, however, think that improvements in tax administration – desirable as they are – are necessarily revenue-increasing.

Managing the composition of expenditure

499. The most serious macroeconomic risk that we have identified is the bidding up of government’s own costs, reducing the real impact of extra public spending. For this reason, there is something to be said for capping total expenditures on wages and salaries, excluding casual work on public works programmes. Ideally, these expenditures should be measured in a way that includes the salaries paid on donor-supported projects; developing a good measure of this total is a challenge. It is also important to develop mechanisms within the budgetary process to monitor the evolution of costs.

500. Costs cannot easily be controlled, however, without cooperation by donors. There is limited evidence on the extent to which inflexible donor modalities increase the effective cost of public action, but we believe it to be significant. The acceptance by donors of the discipline of sectoral strategies defined by government is essential to the achievement of a coherent programme of public expenditure. If projects can be fitted in within such a framework, the project modality may not be a major problem, but budget support will in general be preferable.

501. Both government and donors need to be cautious about the proliferation of initiatives. The PRSP scenarios, while not containing anything outrageously extravagant, represent an already formidable fiscal and managerial challenge. There are some other areas, which we have identified, which may need more money. If resources are devoted to other purposes – however laudable – the chances of delivering the coherent agenda of the PRSP recede. To this end, government needs a much stronger mechanism for filtering projects to ensure that resources are not wasted on schemes that are incompatible with a coherent programme.

502. Forward expenditure planning is needed to take account of the costs incurred in the future by expenditures undertaken now. Pending the development of such a system
as part of the MTEF process, the approach suggested in the PRSP of prioritising cost-reducing over cost-increasing expenditures is appropriate.

503. Beneficial employment effects of public expenditure should not be totally ignored. The use of a public works programme to address unemployment in the rural economy appears to be warranted.

Policies supporting macroeconomic stability
504. There are a number of policies which will be essential to achieving the objectives of the PRSP. However, for the specific concerns of macroeconomic stability, particular attention needs to be devoted to the expansion of exports. The general approach offered by the recently commissioned work on the coffee sector seems appropriate. We do not think some appreciation of the real exchange rate is incompatible, in Rwanda, with the development of a dynamic export sector, because with the right kind of investment the returns to export crops can be greatly increased.

7.4 IMPLICATIONS FOR MACROECONOMIC INDICATORS AND PROGRAMME DESIGN

505. It is inevitable that discussion of macroeconomic programmes will often focus on some summary measures of fiscal stance and sustainability. It is therefore important to choose the right summary measures.

Deficit measures
506. The purpose of deficit measures is usually defined either in terms of fiscal impulse or in terms of the change in the net worth of the public sector. Buiter, in a number of papers, has drawn attention to the effects of inflation in eroding the value of public sector debt. In the low-income context Easterly’s work (cited above) explores the implication of the change in the net worth, showing that standard deficit measures are likely to be inadequate where governments have other ways of accumulating or decumulating assets.

507. In the case of Rwanda’s macroeconomic programming, the main importance of a deficit measure is as an indicator of future macroeconomic vulnerability. This is related to changes in net worth, but also to the certainty of future resource flows (in other words the variance, not only the mean, resource flow is of interest). Given the different levels of uncertainty of different flows, there is a case for monitoring the following three concepts:

- overall deficit excluding grants
- overall deficit including grants
- overall deficit including grants and the concessional element of new loans

508. However, the overall deficit excluding grants is not a very useful measure especially if donors can provide resources on more predictable and flexible terms. In particular, the deficit excluding grants should never be used as a programme target, because there needs to be flexibility to use grants as they become available. The IMF has previously allowed for some flexibility in the Rwanda, but in the PRGF it has been stipulated that unexpected grant inflows should be saved. It should be acknowledged nevertheless that flexibility has been shown over exceptional spending in 2002 for withdrawal of troops from DRC.
The impact of increases in public expenditure on poverty in Rwanda

509. The primary deficit is also designed as a measure of fiscal vulnerability. This gives recurrent and domestically financed capital expenditure, minus revenue. This treats inflows of support differently according to whether they finance recurrent or capital expenditure. The idea of this is that recurrent expenditures are harder to cut than capital expenditures. There are two problems here:

- Most capital expenses imply future recurrent costs, and some recurrent expenditures reduce future costs.
- The use of the primary deficit as a programme target gives the government an incentive to transfer spending from recurrent to capital, which is in some cases likely to reduce the efficiency of spending.

510. As a result, it is preferable to replace the primary deficit by measures which use the distinction between expenditures that increase future recurrent costs and those which reduce future recurrent costs. While the IMF’s definition of ‘exceptional expenditure’ captures aspects of this distinction, it does not capture everything.

511. One serious caveat is that the data indicate that there is a considerable amount of off-budget donor expenditure in Rwanda. This reduces the meaningfulness of any fiscal deficit target. It also raises the potentially serious problem that as aid flows are brought on-budget, there is an illusion that fiscal expansion is taking place, when in reality the flows are constant and only their accounting treatment has changed.

Measures of sustainability

512. The focus on stock ratios of debt to exports encouraged by the HIPC initiative is misguided. Attention should instead be focused on projections of future flows. Forward projections of debt service in relation to exports and the budgetary envelope are important.

How should the deficit and sustainability measures be used?

513. It is now generally accepted that no one deficit or sustainability measure should totally dominate discussion. All summary measures should be understood in the light of forward projections. In particular, three-year programmes should not necessarily be designed to show a reduction in a deficit measure over the period. If there are delays in absorptive capacity and strategy preparation, it may be optimal for a programme to show increasing deficits over the three-year horizon. Of course, this needs to be done in the context of good forward macroeconomic projections.

7.5 BUDGETING AND PLANNING SUBJECT TO UNCERTAIN RESOURCES

Reducing uncertainty for fiscal planning

514. Uncertain resource flows have recently been a major problem for budgetary management in Rwanda. Three institutional changes would help. First, increased length of donor commitments. Secondly, a larger contingent element in concessional loans. For instance, making loan repayments conditional on commodity prices would reduce the uncertainty of net resource flows. Thirdly, where donors can provide assistance that can be shifted across years, this can ease the ‘use it or lose it’ constraint, allowing the size of the intertemporal envelope to be distinguished from the optimal timing of expenditures. Greater mutual understanding on political issues would also help, but there is no obvious institutional way of achieving this.
Managing resources subject to uncertainty
515. Ideally, both macroeconomic programmes and the national budget should be written in a way that is contingent on resource availability. For macroeconomic programmes, this should be easy. For the national budget, there may be legal obstacles to this, and the option of introducing a budget revision partially addresses the need. Managing uncertainty also requires sensitivity analysis in the macroeconomic projections.

516. One of the main uncertainties concerns managerial capacity. This may slow down the government’s ability to spend money. As noted above, there is much more evidence of this on projects than on budget support, and it is possible that donor modalities contribute to the problem. Nonetheless, this uncertainty needs to be managed. First, it makes sense to budget generously and then forecast a less than 100% implementation, especially if it is hard to predict which activities will take off most quickly. Secondly, it is important that funds should not be diverted away from priority activities to quicker-disbursing but less important activities.

7.6 PROCESSES OF PROGRAMME NEGOTIATION
517. The PSIA in Rwanda emerged out of a difficult set of negotiations. Our study suggests some lessons about the process

518. First, the process of negotiation might benefit from the participation of a wider range of stakeholders. The IMF’s approval of macroeconomic programmes is effectively treated by some other donors as a veto. This means that the judgements reached by IMF teams have a wider significance. Given their importance, these judgements need to be informed by the views of economists in other institutions such as the World Bank. In particular, many of the issues discussed in this report involve micro-macro linkages that are acknowledged by IMF staff to be outside their competence (although many of these staff in fact have interesting ideas about them). The separation of micro from macro judgements undermines the quality of the overall macroeconomic assessment. Macroeconomics is too important to be left to macroeconomists.

519. Moreover, the IMF tends to represent one end of a spectrum of technically competent views on macroeconomic stance, and some of the habitual terminology of the IMF – such as the use of the term ‘disequilibrium’ to refer to the current account deficit – comes close to prejudging the issues in a conservative direction. While this would not be a problem if the IMF were simply one among many donors – there is no reason why some donors should not be more conservative than others – it becomes a problem when the IMF’s verdict is taken as an authoritative signal for the actions of the whole donor community. Whether the IMF could go so far as to participate in joint donor review of the whole PRS is not clear, but the macroeconomic discussions need to be more closely integrated to other policy discussions.

520. Secondly, the government’s own capacity to engage in the debate needs to be reinforced by improved macroeconomic modelling capacity.
8 Conclusions of the Rwanda PSIA

521. The study was asked to assess the impact of an increase in public expenditure, financed by grants or loans. The main conclusions of the study are as follows.

Macroeconomic concerns
522. Inflation should not be a major concern for increases in public expenditure financed out of revenue or external sources. The scope for financing out of seigniorage is limited and it would be risky to raise inflation as a form of taxation. There was not time to examine the scope for domestic borrowing in detail.

523. Debt sustainability post-HIPC is less of a problem than is widely thought, when attention is focused – as it should be – on flow rather than stock measures. Debt strategy should be formulated by examining forward macroeconomic projections with an emphasis on the flows. For OPEC lending, the approach needs to be somewhat more cautious than for IDA lending, but there is scope for a certain amount of OPEC lending provided that the overall profile is monitored. The argument that investment is deterred by high public external indebtedness is persuasive for commercial borrowing but unpersuasive (on both theoretical and empirical grounds) for highly concessional lending, if the medium term strategy is on track.

524. The increased expenditures would for the most part incur some costs in the future. Priority should be given to those that actually reduce recurrent costs. The development of a very simple long-run expenditure model might enable the strategic choices to be identified.

525. We would expect the increased expenditures to cause a temporary increase in the relative price of nontraded goods, except where they are financed by food aid. In the Rwandan context, this real appreciation could be directly beneficial in encouraging farmers to use internationally traded inputs on crops grown for the domestic markets. The main impediments to exports are non-price factors and expenditures on transport, rural electricity and extension can all help to address these impediments. Hence the net impact of the expenditures on exports might well be positive, but it will depend on the implementation. If the spike in expenditures is temporary, the real appreciation is likely to be temporary, as the simulation results in annex 6 illustrate. In any case, Dutch disease in the sense of bidding up prices of nontraded goods does not seem to be a strong reason against the increased expenditures.

526. However, there is a related and more important concern. This is that the expansions would cause an increase in prices for goods and services bought by government on the domestic market – wages and contractors’ fees, for instance. This effect could be alleviated by better cooperation between government and donors in choosing least-cost technology for all public sector activities including donor projects. There is a serious shortage of international evidence in this area and the monitoring of costs will pose a major challenge.

527. There does appear to be unemployment in Rwanda and appropriately targeted public work programmes, which are included in the PRSP scenarios, would help to address this.
Conclusions of the Rwanda PSIA

528. Administrative capacity may be a problem for sharp expenditure increases. Experience elsewhere shows that technical capacity can increase fast if a serious decision is taken to prioritise a sector. Nevertheless, an aggregate increase of the order of scenario 3 would pose some significant challenges. It may, however, be best to ascertain these by planning ambitiously and then seeing what is accomplished.

529. The risk of expenditures leaking into other areas if priority areas cannot absorb the funds is hard to assess. Rwanda’s performance has generally been quite good in shifting the budget towards pro-poor spending, but the last budget round showed some strong pressure for expenditures such as military promotions. Both government and donors will need to work more on ensuring that the strategy is adhered to and implemented through the budget.

Benefits of extra expenditure
530. The returns to the proposed expenditures are of many different kinds. Rwanda's PRSP is relatively focused on production, with strong support to economic growth. We accept the main judgements on which the strategy is based, including the importance of generating rural economic growth and the need to achieve technical transformation in small-scale agriculture. There is some concern, however, that the strategy is supply-based and that more work will be needed on ensuring that the products are marketable. This is being addressed in the coffee sector, but will also be important for marketed food crops such as potatoes.

531. As indicated in section 6, the expenditure plans contained in the PRSP are broadly consistent with the poverty strategy outlined. The team have some concerns that certain key areas, implementation of the Land Act, family planning, soil conservation and water supply, are not adequately addressed in the expenditure scenarios, and other programmes included, particularly in health and education, do not appear to be strictly with the activities identified as priorities in the PRSP.

532. The greatest problem in undertaking the expenditure assessment has been the lack of sectoral strategies within which to examine the PRSP activities. The activities identified appear justified as being importantly elements of reducing poverty, both in terms of service provision and growth promotion. However, the precise impact is dependent on how these activities are carried out, and this should be reflected in the sector strategy framework. These strategies are being developed. However, it is important that both at local and national level, capacity to design these activities to maximise their poverty impact, both short and medium term, is developed, and that both output and outcome poverty indicators become a regular part of local and sectoral monitoring processes.

Overall assessment
533. Examining both the macroeconomic concerns and the benefits of the expenditure, we believe that the expenditures proposed are potentially beneficial for poverty-reduction in Rwanda. This is most clearly the case for the ‘constrained’ scenario. As the size of the expenditures increases, the macroeconomic uncertainty also increases, but we also think that the expanded scenario would be beneficial if funded by grants or IDA loans, and possibly even if funded on OPEC terms. The main rider is that the government needs to ensure that sectoral strategies are put in place, that administrative constraints are recognised, and that nonpriority expenditures are restrained in the event that the proposed expenditures cannot be implemented as quickly as envisaged. Given that this
The impact of increases in public expenditure on poverty in Rwanda

draft of the PSIA is now being submitted in 2003, it is clear that either financial or administrative constraints have made the first two years unfeasible, but the study remains important as a guide to expenditure proposals over the next few years.

534. The highly technical nature of the arguments discussed in this paper should not obscure the importance of the question. The stakes are very high. Public action to reduce poverty requires resources, and Rwanda is unusual in the intensity of its needs and the coherence of its proposals for public action. If Rwanda can mobilise extra resources for its anti-poverty strategy, only very serious macroeconomic concerns would justify recommending that it does not do so. Excessive macroeconomic restraint could have grave consequences for the poor.
Annexes
Annex 1  An algebraic presentation of the model of section 3

Let the government seek to take government expenditure and taxation decisions to solve the following standard problem:

\[
\text{max} \sum_{t=0}^{\infty} SW(C_t) \quad (1)
\]

where \( C_t \) is private consumption in period \( t \) and \( W \) is social welfare\(^{164} \)

Now private consumption will depend on public expenditure, \( G_t \) and taxation, \( T_t \). For simplicity, we assume here that government expenditure influences consumption only within the period – an assumption we relax in the macroeconomic model below.

\[
C_t = C_t(G_t, T_t) \quad (2)
\]

(The form of the function is allowed to change over time, allowing for the effects of economic growth).

The critical question is the constraints. The first two are standard.

First, there is an intertemporal budget constraint:

\[
G_t = T_t + \Delta D_t - rD_t + A_t \quad (3)
\]

Where \( D \) is net debt, \( A \) is grants, and \( r \) is the interest rate. (For simplicity, it is assumed that liabilities and debt have the same interest rate).

There must also be a constraint that the level of debt must not explode (a no Pinzogame constraint) relative to the growth of the economy

\[
\lim_{t \to \infty} t D_t/C_t < \infty \quad (4)
\]

As we discuss below in chapter 4, this condition can be met without ever experiencing negative net inflows on debt so long as the interest rate is less than the growth rate of the economy.

So far, we have a standard problem of a form familiar from macroeconomics textbooks such as Blanchard and Fischer. However, the particular circumstances of a country receiving aid mean that it faces additional constraints as well.

First, grants may be treated as exogenous, or the country may face a ‘use it or lose it’ constraint. In the first case, the optimal reaction to a temporary inflow of grants may be to save the majority of it, or to spend it, depending on the relative returns to spending now and in future periods (bearing in mind that the country may also be quantity-constrained

\(^{164} \) (\( C_t \) might be a scalar or a vector, to allow modelling of income distribution)
in the credit market so that it is unable to spend as much as it wants in the current period). Formally, we can express the ‘use it or lose it’ constraint by writing

$$A_t = A_t(G_t), \frac{\delta A_t}{\delta G_t} > 0 \quad (5)$$

If there is an absolute use it or lose it constraint,

$$\frac{\delta A_t}{\delta G_t} = 1 \quad (6)$$

There must also be a quantity constraint given by the limits of international generosity:

$$A_t < A_t^* \quad (7)$$

Where $$A_t^*$$ is the most that donors are willing to provide in grants, whatever expenditure proposals they are presented with.

Obviously, the imposition of the constraint (5) will tend to increase the optimal level of expenditure in the current period, because extra expenditures now translate into extra resources. It is also noteworthy that the imposition of the constraint cannot increase, and is likely to reduce, the discounted sum of social welfare. We therefore discuss, below, the possibility of allowing the government more leeway to transfer expenditures across periods.

Secondly, the country is likely to face either a quantity constraint on lending or an interest rate that is increasing in the volume borrowed:

either $$\Delta D_t^* \geq \Delta D_t \quad (8)$$

where $$(\Delta D_t)^*$$ is the maximum amount of new net borrowing available in the period,

or

$$r_t = r_t(\Delta D_t) \quad (9)$$

In practice, a country such as Rwanda will often face a kinked budget constraint and hence reach a corner solution, where it accepts as much concessional aid as it can get and does not borrow anything at commercial rates.

In terms of this model, the optimal solution will imply accepting all grants unless one of the following two conditions hold:

either government spending has negative net impact

$$\frac{\delta W}{\delta G_t} \leq 0 \quad (10)$$

or there is a less than absolute use-it-or-lost-it constraint,

$$\frac{\delta A_t}{\delta G_t} < 1 \quad (11)$$
In the event that the interest rate is lower than the growth rate of the economy, it can be shown (see section 4 below) that the transversality condition (4) is satisfied even with positive net inflows on debt in all periods. Now government will typically borrow as much as it can so that (8) is satisfied with equality, unless (10) holds (meaning that extra expenditures are harmful): or the quantity constraint on new lending (8) is a binding constraint in some future period, so that extra spending now implies lower spending in that future period: or (9) holds (the cost of lending is increasing): or there is no absolute ‘use it or lose it’ constraint, which can be expressed by making the maximum level of new borrowing in a subsequent period an increasing function of unused debt in previous periods. (Another way of modelling this case would be to put a ceiling on the level of debt or the debt stock ratio D/C).
Annex 2  The demand for money in Rwanda

Standard findings from international estimates of money demand produce the following findings:

- The nominal demand for money responds one-to-one with prices.
- The real demand for money in real terms is reduced by inflation, representing the opportunity cost of holding money.
- The income elasticity is positive, and often lies somewhere between 0.5 and one. (The transactions theory of Baumol predicts an elasticity of 0.5 for cash but depends on specific institutions; different institutions or wealth effects might produce an elasticity nearer 1).

In examining the Rwandan data, we start by plotting the velocity of money. The demand for money may be related with to GDP or to total absorption, which is GDP + the current account deficit. Theory would suggest that absorption should be a better measure of total transactions. The velocity of different definitions of money in Rwanda is plotted in Figure A 2.1.

![FIGURE A 2.1 VELOCITIES OF MONEY IN RWANDA](image)

For 1994-5, there are significant data problems. For seigniorage, it is particularly important to note that currency and reserve money show rising velocities over time, suggesting that seigniorage will grow less fast than economic activity.

We have attempted econometric modelling of these series, regressing the logarithm of nominal money on the logarithm of prices (using the IMF series and the GDP deflator), the change in the log of prices (an approximation of inflation, to represent the opportunity cost of holding money) and real GDP. An alternative functional form is proposed by
Easterly et al.\textsuperscript{165} but Adam\textsuperscript{166} finds the Cagan form works better with Kenyan data). For money, we have modelled currency, demand deposits, M1 and M2. Following the Engle-Granger strategy, we aim to estimate the long-run in levels, then test for cointegration and estimate and appropriate dynamic model. The long-run relations exhibit some problems, illustrating the difficulty of good econometric modelling in the context of extreme instability and problematic data. Two problems stand out. First, the GDP deflator gives parameter estimates mostly close to 1, whereas the coefficient on the IMF price series tends to be significantly below 1. This may indicate that the degree of inflation in the IMF price series is overstated (since there is a strong theoretical presumption that the coefficient should be one). Secondly, the elasticities of money demand with relation to economic activity are disturbingly low, particularly for cash and demand deposits. For instance, the regression for cash using the GDP deflator and the level of absorption gives an elasticity of just 0.1, implying that a 10\% increase in GDP increases cash holdings by just 1\%. This finding is not typical of money demand findings elsewhere and we do not see it as reliable for policy purposes, although it does reflect the experience of macroeconomists that demand for money does not respond to economic activity in Rwanda. The equation for M2 performs relatively well, with a much higher and statistically significant elasticity with respect to absorption and GDP. The response of real demand for money to inflation is negative for most series and larger for M1 than M2, which corresponds to theoretical expectations (since M2 includes interest-bearing assets).

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|c|c|}
\hline
                      & \multicolumn{3}{c|}{Currency} & \multicolumn{3}{c|}{Demand deposits} \\
\hline
prices (GDP deflator) & .82   & .82   & 1.09  & 1.10  & .97   & 1.03  \\
                    & (25.7) & (25.4) & (20.54) & (20.2) & (26.0) & (29.4) \\
Inflation & -.12 & -.12 & -.58  & -.61  & -.39  & -.41  \\
                   & (-.67) & (-.65) & (-1.97) & (-1.95) & (-1.8) & (-1.72) \\
Absorption & .04  & .14  & .10   & .77   & (.32) & (.70)  \\
                 & (.32) & (.70) & (.73) & (5.88) &       &       \\
GDP & .03  & .09  & .12   & .63   & (.28) & (.50)  \\
               & (.28) & (.50) & (.97) & (5.26) &       &       \\
R2 & .98    & .98  & .97   & .97   & .98   & .98    \\
        & (.97) & (.97) & (.97) & (.97) & (.97) & (.97)  \\
DW & 1.89  & 1.90  & 1.81  & 1.88  & 1.71  & 1.35   \\
       & (25.8) & (25.4) & (25.2) & (24.5) & (33.1) & (32.1) \\
prices (IMF series) & .66   & .67   & .88   & .88   & .79   & .79    \\
                   & (25.8) & (25.4) & (25.2) & (24.5) & (33.1) & (32.1) \\
inflation & -.15 & -.13 & -.57  & -.61  & -.39  & -.40  \\
         & (-.67) & (-.54) & (-1.82) & (-1.75) & (-1.8) & (-1.7) \\
absorption & .11  & .16  & .14   & .87   & (.61) & (.67)  \\
             & (.61) & (.67) & (.89) & (6.2) &       &       \\
GDP & .10  & .10  & .11   & .76   & (.62) & (.46)  \\
        & (.62) & (.46) & (.72) & (5.52) &       &       \\
R2 & .98    & .98  & .98   & .98   & .99   & .99    \\
      & (.98) & (.98) & (.98) & (.98) & (.99) & (.99)  \\
DW & 1.92  & 1.93  & 2.18  & 2.26  & 2.27  & 2.3    \\
       & (25.8) & (25.4) & (25.2) & (24.5) & (33.1) & (32.1) \\
\hline
\end{tabular}
\caption{Long-run regressions for the demand for money in Rwanda}
\end{table}

Regressions of the logarithm of money on the logarithms of prices, log of absorption or GDP, and the change in the log of prices. T-ratios in parentheses.

\textsuperscript{165} W.Easterly, P.Mauro and K.Schmidt-Hebbel, Money demand and seigniorage-maximizing inflation, Journal of Money, Credit and Banking, pp.583-603 (1995)

\textsuperscript{166} C.Adam, Financial liberalisation and currency demand in Zambia, Journal of African Economies vol 8 no.3, pp.286-306
We have also estimated dynamic models for the equations using absorption and the GDP deflator, shown in Table A 2.1.

<table>
<thead>
<tr>
<th>TABLE A 2.2 SHORT-RUN REGRESSIONS FOR THE DEMAND FOR MONEY IN RWANDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency: Demand deposits</td>
</tr>
<tr>
<td>prices (GDP deflator)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Inflation</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Absorption</td>
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<tr>
<td></td>
</tr>
<tr>
<td>ECM</td>
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<td></td>
</tr>
<tr>
<td>R2</td>
</tr>
<tr>
<td>DW</td>
</tr>
</tbody>
</table>

Regressions of the change in the logarithm of money on the changes in logarithms of prices, log of absorption or GDP, and inflation, and the error from the previous period. T-ratios in parentheses.

We have also attempted to relate demand for money to the sectoral composition of GDP. Using the same logarithmic functional form, we find significant positive effects of services, but no effects or negative effects of agriculture and industry. These results suggest that rural households, who earn cash largely from agricultural activities, may hold little money. But it would be risky to infer too much, given that a negative elasticity for the scale variable is very hard to interpret.
Annex 3  Future expenditure implications by ministry

The additional expenditures falling under the various ministries will be allocated to specific activities, with medium term expenditure implications, as follows:

MINAGRI

Seasonal credit: A seasonal credit scheme should only incur major costs in the year which it is set up – the financing of the core fund. If there are reasonable repayment levels, the recurrent costs should be restricted to administrative costs, and coverage of bad debt. The PRSP estimates for a fund of 0.5 billion RwF are administrative costs of 2%.

Seeds: the PRSP scenarios envisages the setting up of a seed multiplication centre, with initial set-up costs of 0.1 billion RwF in 2002 and recurrent running costs of 0.01 RwF in subsequent years.

Labour intensive public works: The labour intensive public works programme proposed in the PRSP as a way of absorbing under and unemployed labour, and providing a boost to non-farm job creation was envisaged to develop over a ten year period, with the peak year, both in terms of cost and labour absorbed, being in year five, with a scaledown after that as overall growth creates more jobs. The programme has still to be costed in detail, and the scale on which its is adopted can be scaled up or down according to circumstances, but as it stands there would be cost implications for a ten-year period, i.e. for seven years minimum after the PRSP period.

However, provided that labour is employed on a casual basis, and households do not become absolutely dependent on employment on the scheme, it should be possible to adjust expenditures on this scheme more easily than can be done with the government wage bill.

Development of breeding: This activity is to be started in 2004. Any significant investment in improving local breeding of livestock will involve at least a ten year programme, including dissemination costs. The need for imported livestock could fall as a domestic stock is built up, but the other costs are likely to remain.

Conservation of water and soils: It is difficult to assess a priori to what extent expenditures under this heading are likely to be recurrent, though they appear within the development budget. Historically, Rwandan farmers undertook these activities either individually or communally on their own behalf. However, that has fallen away after the war and genocide. It is doubtful to what extent this can be revived, especially if conservation activities are covered by the public works programme. It is safer to assume that these are effectively going to be long-term expenditure commitments.

Extension services: These are recurrent costs, and, while the number of extension agents can be cut at short notice, should be regarded as long-term costs.
MINISANTE

**Drugs:** At best these expenditures, to subsidise the cost of certain key drugs in certain areas, will be expenditure neutral, but in practice this kind of programme tends to be difficult to curtail once set up. Here it is being categorised as expenditure augmenting.

**Bednets:** Once the whole country has been covered by bednet distribution, then it should be expenditure reducing, by drastically cutting the incidence of malaria. In any given initial set-up year, the costs are likely to outweigh the benefits, but if the returns are measured over time, then experience in other countries indicates that there should be positive returns to the programme.

**Animateurs:** This is a preventive health care programme (see below).

**Mutuelles:** This is a form of health insurance. Once it has been set-up it should reduce costs to the public purse, by enabling individuals to pay for their basic health care costs.

**Preventive health care:** In theory this should be expenditure reducing, by reducing the demand for acute health care. In practice, to be effective, the preventive health care has to be continuous, so much depends on the relative effectiveness of the expenditure, and the extent to which acute health care is supply constrained. It is possible that preventive health care is effective, but does not reduce acute health intervention costs, rather allowing more people to benefit from the combination of health services.

**Hospital rehabilitation and equipment:** This will tend to be expenditure neutral. There are unlikely to be high additional maintenance costs associated with the initial investment.

**Hospital salaries:** This is the most clearly expenditure augmenting activity of any, as it is very difficult to reduce salaries, even more so than laying off additional staff.

MINEDUC

**Textbooks:** The textbook programme is intended to start a rolling programme of provision of textbooks, one for each of six subjects per three students, so that at the end of three years each student would have six books. On the assumption that a textbook lasts three years, this will then be repeated on a rolling basis. The textbook expenditure is therefore continuous, part of an expenditure augmenting programme.

- **School rehabilitation and equipment:** This element should be expenditure neutral.
- **Recruitment:** Recruitment is expenditure augmenting.
- **Non-wage costs of schools:** Non-wage costs of schools can be seen as expenditure neutral.
- **Higher education expansion:** This is likely to be expenditure augmenting.
- **Scientific and technological research:** This is also likely to be expenditure augmenting in the medium term, as particular programmes are unlikely to be restricted to a three year framework.
MINICOM

Export promotion: There are additional recurrent expenditures under this heading. It seems unlikely that they will achieve very much unless they are continued for a longer period than three years. It is possible that, depending on the export tax regime, and the multiplier effect of increased exports, that this kind of expenditure could pay for itself, but it seems safer to expect it to be expenditure augmenting over the foreseeable future.

Industrial promotion and craft industry promotion: This is very similar to export promotion expenditures.

MINITRACO

Road maintenance: This should be seen as the establishment of a systematic process of regular road maintenance, and therefore as, in one sense, expenditure augmenting. This is a rather ambiguous area, because it could be argued that action at this point avoids more expensive maintenance later. However, it will be classified as expenditure augmenting.

Road rehabilitation: This is also expenditure augmenting, in that to get good value from road rehabilitation, there must be future resources set aside for maintenance. However, these would be of a smaller magnitude that the rehabilitation costs.

Feasibility study for ports: This can be seen as expenditure neutral. The decision to invest on the basis of the feasibility study, though in one sense is seen as possible, or there is no point in undertaking the study, in another sense is a totally separate decision.

Railway feasibility study: As above for port studies.

MINIRENA

Feasibility study for power generation and grid extension: This could be seen as expenditure neutral, if it were not for the fact that scenario 3 frontloads this activity and devotes a large increase in expenditure to its implementation.

Support to mining sector: Under this heading come a number of diverse activities, such as establishing a databank, adding value to various metallic ores and rocks, creating a seismic centre for volcano surveillance and improvement of mining sites. These all have longer term recurrent cost implications and should be classified as expenditure augmenting.

Update electrification master plan and start up: This activity starts slowly and builds up in scenario 3. It is a follow-on from the feasibility studies proposed in scenario 2. Together they should be seen as the beginning stages of a much larger electrification programme, and therefore as expenditure augmenting.

Improve sourcing of renewable energy: A number of activities, such as stove promotion, use of solar energy for electrification and substitution away from charcoal are included. Some of these have recurrent cost implications, but others are neutral. Overall, these will be classified as expenditure neutral.
**Water and purification for schools and hospitals:** These are, for the most part, stand alone investment activities where the recipients will be responsible for maintenance. They are expenditure neutral.

**Rural water provision:** The same as above.

**MIJESPOC**

**Rehabilitation of apprenticeship centres:** This is expenditure neutral, but the recurrent expenditure cost for professional apprenticeships is expenditure augmenting.

**MINITERE**

**Supervision of planning and conservation programme:** This has expenditure augmenting implications

**Emergency roofing and water harvesting kits for homeless:** This is expenditure neutral, and, under some circumstances could even be seen as having an expenditure reducing aspect, by reducing illness and therefore demand on the health service.

**Land titling:** This is being classified as expenditure augmenting, as the first part of a much bigger expenditure programme.

**MINALOC**

**Adult literacy:** This is expenditure augmenting.
Annex 4  Modelling the real exchange rate

The Dutch disease hypothesis suggests that the real exchange rate should be regressed on the ratio of absorption to GDP, with the expectation of a positive coefficient. It is desirable, however, also to correct for the effects of the terms of trade, GDP growth and policy stance. GDP growth has an ambiguous effect; for instance, a productivity shock in the non-traded sector will tend to depreciate the real exchange rate, but increased productivity in the traded sector will tend to increase it. However, it is important to include GDP growth in the model since if it is omitted the coefficient on absorption/GDP will pick up the impact of productivity shocks as well as aid flows. An increase in terms of trade should appreciate the real exchange rate. Policy stance is represented by the share of trade taxes in total revenue; the prediction is that a high share of trade taxes will tend to appreciate the real exchange rate, as it pushes up the domestic price level for any given world price level, inducing shift in demand towards non-traded goods.

Table A 4.1 presents regressions of the exchange rate on absorption/GDP, real GDP, terms of trade and the share of trade taxes in revenue\textsuperscript{167}.

<table>
<thead>
<tr>
<th>TABLE A 4.1  REGRESSIONS OF THE REAL EXCHANGE RATE ON ITS DETERMINANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMF definition</strong></td>
</tr>
<tr>
<td>Absorption/GDP</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GDP</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Terms of trade</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Share of trade taxes in revenue</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DW</td>
</tr>
<tr>
<td>R2</td>
</tr>
</tbody>
</table>


The coefficient on absorption is highly significant in both equations, but has the opposite sign to the Dutch-disease prediction. The likeliest reason is the endogeneity of absorption/GDP. In the event of real devaluation, the value of aid flows in domestic currency will increase; so will the value of imports, if the elasticity of demand is less than one. Both of these effects tend to increase the ratio of absorption to GDP. The negative coefficient is probably picking up these effects. Hence, while the equations provide no evidence for the Dutch disease hypothesis, they do not definitely refute the hypothesis either.

\textsuperscript{167} Other versions tried included GDP per capita (which, unlike GDP, should theoretically and empirically have a long-run relationship with the real exchange rate) and estimation in differences. The perverse negative coefficient on the ratio of absorption to GDP is the only robust result.
Another possibility is that the use of food aid tends to reduce food prices. For this reason, it cannot be taken for granted that the food/export price rate in Rwanda is higher than it would be in the absence of foreign assistance. Since food is a large part of the CPI and, as we have seen above, its price is positively correlated with at least the IMF measure of the real exchange rate, this may shed some light on the results.

The results also shed little light on the reasons for the decline in the real exchange rate. One possibility is that the damage done to exports by nonprice factors has caused the decline. Also, the government of the 1980s and early 1990s often required farmers to grow coffee even if it was not profitable for them; this may have artificially supported the exchange rate. The relaxation of this form of control would then cause a real devaluation.

A referee has suggested including the composition of expenditures as well as the overall level of absorption. We tried including government consumption and fixed capital formation, but with little improvement in the results. He also pointed out that the trade share of revenue may be endogenous; while true, this also applies to the share of imports in GDP and other measures of openness standard in the literature. Disaggregating government expenditure itself into traded and nontraded would be a very substantial exercise, especially since the wage bill does not capture emoluments on projects. We also tried using lags on the right hand side as in Elbadawi et al. in the hope that this might address the simultaneity problem, again with no success. After examining the work by Elbadawi et al., we are not clear why the results are so much less successful in the Rwandan case.

Annex 5  Tax elasticities in Rwanda

Tax rates have been studied in a project supported by DFID\textsuperscript{169}. The main body of this paper gives estimates of the revenue share under a linear model of tax collection, where coefficients are allowed to increase as the structure of the economy alters over time. In different models, the revenue share may increase. The annex, based on a discussion paper by Kigabo, presents econometric estimates of the elasticities of particular taxes with respect to GDP and to monetised GDP. These models show the tax system as a whole to be inelastic to GDP and even to monetised GDP, indicating that the share of taxes in GDP is likely to fall over time. However, the data given for GDP appear to include a structural break, which may have biased estimates downwards\textsuperscript{170}. It therefore seems worthwhile to attempt some further estimates with a revised GDP series, also distinguishing between increases in nominal GDP due to price increases, population growth, and growth of GDP per capita. and allowing for the effects of the marked change in tax policy during the late 1990s, when taxes were shifted from taxes on trade to broader-based taxes on goods and services.

We therefore use the data in the DFID paper for revenues but estimate a slightly different model and use a revised GDP series. Table A 5.1 present the results. While tax structure changes during the period, it may be reasonable to assume that these changes have been designed to be approximately revenue-neutral in the short run. The equations perform relatively well, and suggest that despite the apparent stagnation of revenue as a share of GDP, there is much more buoyancy in the Rwanda tax system than has been generally believed. The version using GDP – which performs better than the version using absorption – gives an elasticity of revenue with respect to real GDP of 3.3. This is encouraging news for revenue prospects (though it would also make revenues sharply responsive to drops in economic activity).

<table>
<thead>
<tr>
<th>dependent variable: nominal government revenue</th>
<th>GDP version</th>
<th>Absorption version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regressions in levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real GDP per capita</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>(4.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real absorption per capita</td>
<td>1.86</td>
<td></td>
</tr>
<tr>
<td>(1.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>1.50</td>
<td>1.97</td>
</tr>
<tr>
<td>(5.1)</td>
<td>(4.35)</td>
<td></td>
</tr>
<tr>
<td>GDP deflator</td>
<td>1.26</td>
<td>.76</td>
</tr>
<tr>
<td>(6.58)</td>
<td>(4.46)</td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>0.97</td>
<td>.94</td>
</tr>
<tr>
<td>DW</td>
<td>1.46</td>
<td>1.47</td>
</tr>
</tbody>
</table>

\textsuperscript{169} Review of Tax Policy and Tax Administration Forecasts of Revenue to 2020, REPIM (John Short, Tim Jones and Rusuhuzwa Kigabo Thomas).

\textsuperscript{170} The reported series for GDP in the dataset included by the authors increases by almost 200% in 1990; if this reflects the use of a different base year, it would cause a downward bias in the parameter estimates.
Annexes

<table>
<thead>
<tr>
<th>Error correction model</th>
<th>GDP version</th>
<th>Absorption version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP per capita</td>
<td>3.07</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>(5.0)</td>
<td>(2.3)</td>
</tr>
<tr>
<td>Real absorption per capita</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>2.35</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>(6.0)</td>
<td>(4.5)</td>
</tr>
<tr>
<td>GDP deflator</td>
<td>1.34</td>
<td>.58</td>
</tr>
<tr>
<td></td>
<td>(3.4)</td>
<td>(1.19)</td>
</tr>
<tr>
<td>ECM</td>
<td>-.69</td>
<td>-.79</td>
</tr>
<tr>
<td></td>
<td>(-3.0)</td>
<td>(-3.6)</td>
</tr>
<tr>
<td>R2</td>
<td>.97</td>
<td>.95</td>
</tr>
<tr>
<td>DW</td>
<td>1.65</td>
<td>1.30</td>
</tr>
</tbody>
</table>

All variables are in logs so parameters are elasticities. Dummy for 1994 is included. Estimates from 1982 to 2000. T-ratios in parentheses. The error correction models are estimated in differences except for the lagged error from the levels equation (the ECM).
Annex 6 The macroeconomic consistency model

THE STRUCTURE OF THE MODEL
The purpose of the model is to provide plausible orders of magnitude for the short- and long-term impact of public expenditure on poverty, growth and other macroeconomic indicators in Rwanda. For this purpose, public expenditure is treated as exogenous within each period. Inflation is also treated as exogenous.

The major impacts studied are the supply-side impact of public expenditure, and Dutch disease and debt sustainability effects. In the context of consistency models, our model is unusual in explicitly modelling the real exchange rate and its effects on exports and in relating output to the permanent effects of public expenditure. This allows supply-side and Dutch disease issues to be modelled without building a CGE model.

The model is specified in real terms and works as follows. First, the levels of public expenditure are set into the future. This is appropriate for a model examining the impact of different trajectories for public expenditure. Next, GDP is determined by productivity capacity. This depends on cumulative public expenditure and cumulative private investment. Thus, public expenditure (both recurrent and capital) adds permanently to the productive capacity of the economy, though in a concave fashion to catch diminishing returns to expenditure in any give period. Revenue depends linearly on GDP and consumption depends on disposable incomes in the period. Investment depends, through a linear accelerator function, on the increase in output.

The government sector is modelled as follows. Expenditure, as above, is exogenous, and revenue depends on disposable income. The deficit is financed either by aid or by external borrowing. Implications for the future flow and stock ratios for external debt are derived through accounting identities, using baseline information on the stock of external debt, assumptions about the terms of financing and the nominal exchange rate. (This then has to be linked through the real exchange rate???)

The external sector is not explicitly modelled. However, it is assumed that the demand for nontraded goods depends on overall absorption and their supply on productive capacity in the economy. The reduced form representation of this is that the real exchange rate is dependent on the ratio of absorption to GDP. The real exchange rate then enters the export supply functions, and also determines the nominal exchange rate. This parameter determines the foreign currency financing implications of the domestic public sector deficit.

The model is recursive in structure, and simple enough to be estimated on a single spreadsheet without iteration.

Inflation, public capital and recurrent expenditure in real terms and world coffee an tea prices are treated as exogenous.
National accounts

\[171\] We have benefited enormously from exchanging ideas with Paul Beckerman on this model.
All the national accounts variables are derived in real terms, imposing an inflation rate of 3% to all sectors. (Since there is a term for the real exchange rate, this amounts to assuming that the non-traded share of all sectors is the same).

Production is determined by productive capacity, which depends on cumulative public expenditure and cumulative private investment.

\[ CPE = CPE(-1) + G(1 + a_0(G/Y(-1) - .22)) \]

where PE is public expenditure in real terms.

Public expenditure – both recurrent and investment – is treated as a capital stock which produces a permanent increase in productivity. The joint treatment of recurrent and development is warranted by the design of the PRSP scenarios; it would not apply to public recurrent expenditure more generally. It is assumed that the effect of public spending is concave, catching absorptive capacity and price effects of increases in public expenditure within any one period. No attempt is made to model the lag between education spending and productivity, which is a possible future refinement.

\[ CPI = CPI(-1) + I(1 + f_5(I/GDP(-1) - .12)) \]

where I is private investment in real terms. The capital stock depends on investment in a concave fashion.

In both the equations for cumulative private investment and public expenditure, the turning points are taken as approximately the values in the base year.

\[ AGR = a_1 + a_2 CPE + a_3 CPI(-1) \]
\[ IND = b_1 + b_2 CPE + b_3 CPI(-1) \]
\[ SERV = c_1 + c_2 CPE + c_3 CPI(-1) \]

Growth is driven by public actions and private investment. The parameters are set so that agriculture depends more on public expenditure and industry on private investment. This reflects the judgement that the investment that is key for agriculture is often not well measured in the national accounts. The effects of private investment are lagged to preserve the recursive structure of the model, which is designed to be soluble on a single spreadsheet.

The linear parameters are based on an inverted ICOR of 5 so that the total effect of CPE is \(a_2 + b_2 + c_2 = 0.2\) and that of CPI is \(a_3 + b_3 + c_3 = 0.2\).

\[ GDP = AGR + IND + SERV \]
\[ \Delta \log(R) = d_2 \Delta \log(Y) \]

The elasticity in the base run is set at 1.5, which is a conservative estimate in light of the econometric results, although some authors have found lower elasticities in cross-country work. A possible extension would make revenue dependent on the sectoral pattern of output.

\[ C = e_1 + e_2 (Y - R) \]
This is a standard linear Keynesian consumption function. In principle consumption might also depend on the real exchange rate, both because the household sector is likely to be a net seller of nontraded goods to the public sector, and because there are possible monetary effects (though with inflation exogenous this raises some questions). We avoid this in order to keep the model recursive.

\[ I = f_1 + f_2 \Delta AGR + f_3 \Delta IND + f_4 \Delta SERV \]

Investment depends on income in a linear accelerator relationship, such that increases in activity cause increases in investment.

\[ A = G + C + I \]

As noted above, all the above equations are in real terms. Nominal magnitudes are found by imposing the exogenous inflation rate of 3%.

**External sector**

As explained above, the real exchange rate represents the relative price of nontraded goods which adjusts to clear the nontraded goods market. In this market, absorption increases demand whereas production increases supply. Hence

\[ \ln(e) = g_1 + g_2 \ln(A/GDP) \]

Despite the failure of our econometric investigation to identify this relationship in Rwanda, we assume that it holds on the basis of theory and international experience. The real exchange rate is defined so that an increase represents a depreciation of the Rwandan franc in real terms and \( g_2 \) is assumed to be positive.

\[ f = f_{base} \cdot \left( \frac{e}{100} \right) \cdot p_d/p_f \]

The nominal (f) and real (e) exchange rates are defined so that an increase represents a depreciation of the local currency (an increase in the domestic cost of foreign exchange). World inflation is set at 3%.

The function of the real exchange rate in the model is twofold: it directly influences the incentives for exports (the ‘Dutch disease’ assumption): and it determines the nominal exchange rate and therefore the foreign financing implications.

Exports are derived from a supply function derived in quantity terms. For convenience, it is assumed that export supply depends on the same factors as GDP as a whole, but grows more than proportionately. The reason for this assumption is that to model coffee with a linear dependence on public investment and public expenditure raises the difficult question of identifying a linear parameter, and would not be intuitively interpretable. It is more intuitively clear to assume that the proportional growth of coffee will reflect the proportional growth of GDP. However, it is very important to understand that this is not a demand-led equation but reflects the underlying dependence of exports on public investment and public expenditure. This involves assuming that exports are more dependent on measured private investment than other agriculture, which is reasonable. Export supply also, however, reflects the real exchange rate.
\[ \Delta \ln (\text{Coffee}) = h_1 \Delta \ln \text{GDP} + h_2 \Delta \ln (\text{REER} \ast \text{PCR}) \]
\[ \Delta \ln (\text{Tea}) = j_1 \Delta \ln \text{GDP} + j_2 \Delta \ln (\text{REER} \ast \text{PCT}) \]
\[ \Delta \ln (\text{Othexp}) = k_1 \Delta \ln \text{GDP} + k_2 \Delta \ln (\text{REER}) \]

Here the ‘Rwandan price’ is the dollar price received by Rwanda for its exports, in constant dollars.

Similar relations hold for other exports. However, coltan is assumed to fall exogenously in 2002 and then fixed at a lower level.

The conversion of these magnitudes into nominal terms depends on the world price. Rwandan tea is already high quality, but its coffee is capable of considerable improvement. The government argues that higher-grade coffee not only has higher prices, but also much better future price prospects, extrapolating from recent trends in coffee prices. Other observers have argued that this assumption may produce excessively optimistic export projections. For simplicity, we impose the assumption that the gap between the world price reported in international commodity markets remains constant for tea but closes asymptotically for coffee.

\[ \frac{\text{P}_{\text{WC}} - \text{P}_{\text{RC}}}{\text{P}_{\text{WC}}} = h_6 \left( \frac{\text{P}_{\text{WT}} - \text{P}_{\text{RT}}}{\text{P}_{\text{WT}}} \right)^{-1} \]
\[ \frac{\text{P}_{\text{WT}} - \text{P}_{\text{RT}}}{\text{P}_{\text{WT}}} = \left( \frac{\text{P}_{\text{WT}} - \text{P}_{\text{RT}}}{\text{P}_{\text{WT}}} \right)^{-1} \]

- again, in constant dollars. Exports are then converted back into constant RWF. Imports are then found as a residual from the national accounts:

\[ M = G + I + C + X - \text{GDP} \]

Here M is the real value of expenditure on imports. The treatment of imports as residual is logical in that it treats domestic absorption as setting demand in the traded goods market, and allows the gap between demand and supply to be met through international trade. This is somewhat more logical than the practice often followed in consistency models of making consumption the residual. It has the admitted drawback of not allowing the model conveniently to incorporate terms-of-trade effects.

The balance of payments includes exports, imports, interest on public external debt, and public external financing (which comes from the fiscal sector below). It is closed by a residual term in ‘other flows’, O.

\[ O = (M+a+i+X-(G-R+i)) \]

Where the last term captures the government’s financing gap after interest, which is assumed to be covered by the government’s own external financing. Hence other flows are needed only to cover the deficit arising from the gap between private saving and investment.

This is obviously a rather brief treatment of the balance of payments, and is really used as a diagnostic tool. Since the public sector deficit is assumed to be fully financed by external flows, the question that arises is whether private consumption and investment grow faster than output, creating a need for private sector financing.
Fiscal sector
The fiscal accounts are derived as follows. Noninterest public expenditure is exogenous, using the PRSP projections for the first three years and then making an assumption for each scenario. In the baseline scenario public expenditure is assumed to grow at 7%; in the two more expanded scenarios it is held constant in real terms for five years after the initial three year period, producing a temporary spike in the share of public expenditure in GDP.

Public sector debt is assumed to be external and treated as follows. We use the government’s data on existing amortisation and interest commitments at end-2001. Net present value is calculated by applying the discount rate of .063 to the stream of payments. This gives values of amortisation, \( a_{\text{old}t} \), interest, \( i_{\text{old}t} \), face value, \( D_{\text{old}t} \), and net present value, \( V_{\text{old}t} \), for each period \( t \).

New debt, defined as all debt contracted from 2002 onwards, is more complex.

For 2002 onwards, we calculate the new borrowing needed as

\[
L_{\text{new}t} = G - R + a_{\text{old}t} + a_{\text{new}t} + i_{\text{old}t} + i_{\text{new}t} - g_t
\]

where \( g \) is grants.

We assume that the government borrows new funds at least to keep its nominal stock constant. Any net increase in debt stock is funded either by 100% grants, 100% loans, or 50% grants and 50% loans. Obligations incurred by new debt are then calculated, assuming IDA terms of 0.75% service charge, 0% interest, and 40 years’ maturity including 10 years’ grace (except in the simulation where OPEC terms are used).

It would be cumbersome to calculate net present value explicitly for the stream of obligations extant at each particular year for new debt, since it would involve creating a separate row as well as column for each year. To keep the spreadsheet manageable, net present values in future periods are calculated by a short cut where net present value is increased by a given proportion of new lending; this proportion \( z \) is calculated at .34 and .62 for IDA and OPEC loans respectively. A discount rate of 6.3% is used in this calculation. The net present value of existing debt increases by a factor of 1.063 in each period minus any amortisation or interest paid. The net present value is also increased by \( z \) times the amount of new lending. Hence we get

\[
\Delta V_{\text{new}t} = 1.063 V_{\text{new}t-1} - r_{\text{new}t} - a_{\text{new}t} + z L_{\text{new}t}
\]

Parameter values
Table A 6.1 gives some of the main parameter values for the model. The model is constructed so that parameters can easily be changed and the results revised accordingly.
TABLE A 6.1 VARIABLE DEFINITIONS AND PARAMETER VALUES FOR THE CONSISTENCY MODEL

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions</th>
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<tbody>
<tr>
<td>G</td>
<td>Government noninterest expenditure in constant RWF</td>
</tr>
<tr>
<td>CPE</td>
<td>Cumulative public expenditure in constant RWF</td>
</tr>
<tr>
<td>I</td>
<td>Private investment in constant RWF</td>
</tr>
<tr>
<td>CPI</td>
<td>Cumulative private investment in constant RWF</td>
</tr>
<tr>
<td>AGR, IND, SERV</td>
<td>Agriculture, industry and services in constant RWF</td>
</tr>
<tr>
<td>GDP</td>
<td>GDP in constant RWF</td>
</tr>
<tr>
<td>R</td>
<td>Revenue in constant RWF</td>
</tr>
<tr>
<td>C</td>
<td>Private consumption in constant RWF</td>
</tr>
<tr>
<td>A</td>
<td>Absorption in constant RWF</td>
</tr>
<tr>
<td>e</td>
<td>real exchange rate, increasing when the real cost of foreign exchange increases</td>
</tr>
<tr>
<td>f</td>
<td>nominal exchange rate, RWF per dollar</td>
</tr>
<tr>
<td>Coffee, Tea, Othexp, X</td>
<td>Coffee, tea, other exports, total exports in constant RWF</td>
</tr>
<tr>
<td>pd, pf</td>
<td>domestic and foreign prices</td>
</tr>
<tr>
<td>PWC, PRC, PwT, PRC</td>
<td>Prices for world coffee, Rwandan coffee, world tea and Rwandan tea in constant dollars</td>
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<tr>
<td>M</td>
<td>Value of expenditure on imports in constant RWF</td>
</tr>
<tr>
<td>O</td>
<td>Other flows (residual in balance of payments), current dollars</td>
</tr>
<tr>
<td>g</td>
<td>Grants in current dollars</td>
</tr>
<tr>
<td>V, V old, V new</td>
<td>Net present value in current dollars</td>
</tr>
<tr>
<td>D, D old, D new</td>
<td>Face value in current dollars</td>
</tr>
<tr>
<td>a, a old, a new</td>
<td>amortisation in current dollars</td>
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<tr>
<td>i, i old, i new</td>
<td>interest in current dollars</td>
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<tr>
<td>L</td>
<td>borrowing</td>
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<tr>
<td>z</td>
<td>Ratio of NPV to face value for new loans</td>
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<table>
<thead>
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<th>Parameters</th>
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<td>b3</td>
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<td>h6</td>
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SIMULATION RESULTS

We have run the model has been estimated for the following cases. There are obviously many other cases that could be simulated.

- Case 1 (preferred model)
- Case 2 lower revenue buoyancy
- Case 3 high consumption propensity
- Case 4 lower export buoyancy
- Case 5 No HIPC relief
- Case 6 borrowing at OPEC terms

1 Main case of the model

Here all parameters are as in the text. New lending is assumed to be on IDA terms.

<table>
<thead>
<tr>
<th>TABLE A 6.2</th>
<th>1A BASELINE, SCENARIO 1</th>
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<tbody>
<tr>
<td>Public expenditure as % of GDP</td>
<td>20.1</td>
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<tr>
<td>Revenue as % of GDP</td>
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Balance of payments

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<tbody>
<tr>
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<td>7.9</td>
<td>8.6</td>
<td>9.3</td>
<td>12.5</td>
<td>16.2</td>
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<td>27.8</td>
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<td>10.9</td>
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<td>Debt service/exports</td>
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<td></td>
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<tr>
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<td>8.8</td>
<td>8.8</td>
<td>8.4</td>
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<td>8.8</td>
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<td>8.8</td>
<td>8.1</td>
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<td>6.1</td>
<td>3.3</td>
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<td>1.2</td>
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### TABLE A 6.3 1B SCENARIO 2, CONSTRAINED

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<td>30.6</td>
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<td>24.4</td>
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<td>12.4</td>
<td>12.9</td>
<td>13.4</td>
<td>15.7</td>
<td>18.2</td>
<td>21.1</td>
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**Balance of payments**

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<tr>
<td>Exports as % of GDP</td>
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<td>6.9</td>
<td>7.2</td>
<td>8.1</td>
<td>8.9</td>
<td>13.1</td>
<td>16.9</td>
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<tr>
<td>Imports as % of GDP</td>
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<tr>
<td>External government financing minus interest</td>
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<td>17.7</td>
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<td>10.6</td>
<td>2.8</td>
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<td>-1.8</td>
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<td>10.7</td>
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<td>5.1</td>
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**Real exchange rate**

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**Consumption growth**

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<td>15.6</td>
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**Debt service/exports**

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<td>9.0</td>
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<td>8.9</td>
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<td>8.9</td>
<td>8.1</td>
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**NPV/exports**

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### TABLE A 6.4 1C UNCONSTRAINED, SCENARIO 3

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<td><strong>Public expenditure as % of GDP</strong></td>
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<tr>
<td><strong>Revenue as % of GDP</strong></td>
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<td>11.9</td>
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## 2 Low revenue buoyancy

Here the elasticity of revenue with respect to GDP is set at 1.

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#### Balance of payments:

- **Exports as % of GDP**: 9.4, 7.5, 7.7, 8.3, 8.9, 11.0, 12.9, 15.4
- **Imports as % of GDP**: 27.6, 28.0, 28.4, 27.5, 27.4, 27.1, 27.5, 29.1
- **External government financing minus interest**: 8.0, 10.7, 11.2, 10.5, 10.5, 10.5, 10.2, 10.1
- **Other flows**: 10.3, 9.8, 9.4, 8.7, 8.0, 5.6, 4.4, 3.6

#### Real exchange rate

- 100.0, 98.1, 98.1, 99.2, 99.8, 101.9, 103.2, 104.0

#### GDP growth

- Agriculture: 7.3, 7.3, 7.2, 7.1, 6.9, 6.8, 6.7
- Industry: 10.9, 10.9, 10.4, 10.0, 8.5, 7.8, 7.3
- Services: 4.7, 4.9, 4.9, 5.0, 5.3, 5.6, 5.8

#### Consumption growth

- 5.8, 6.8, 6.7, 6.7, 6.6, 6.6, 6.6

#### Export growth

- -12.9, 11.4, 13.6, 13.6, 11.2, 10.0, 10.4

#### Debt service/exports

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#### NPV/exports

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3 High consumption
Here the marginal propensity to consume is set at 1. The idea is to see whether a balance-of-payments problem emerges as a result. However, even in this case ‘other flows’ (which include off-budget aid and are substantial) do not explode as a proportion of GDP.

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**Balance of payments**

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**Real exchange rate**

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**Consumption growth**

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**Debt service/exports**

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**NPV/exports**

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#### Balance of payments
- **Exports as % of GDP**
  - 2001: 9.4
  - 2002: 6.4
  - 2003: 6.5
  - 2004: 7.1
  - 2005: 7.8
  - 2010: 11.1
  - 2015: 13.8
  - 2020: 17.8
- **Imports as % of GDP**
  - 2001: 27.6
  - 2002: 43.5
  - 2003: 45.0
  - 2004: 41.2
  - 2005: 38.0
  - 2010: 28.0
  - 2015: 27.2
  - 2020: 27.6
- **External government financing minus interest**
  - 2001: 8.0
  - 2002: 24.2
  - 2003: 25.1
  - 2004: 21.1
  - 2005: 17.8
  - 2010: 6.8
  - 2015: 2.6
  - 2020: -0.8
- **Other flows**
  - 2001: 10.3
  - 2002: 12.9
  - 2003: 13.4
  - 2004: 12.9
  - 2005: 12.4
  - 2010: 10.1
  - 2015: 10.8
  - 2020: 10.6

#### Real exchange rate
- 2001: 100.0
- 2002: 86.3
- 2003: 85.4
- 2004: 88.2
- 2005: 90.9
- 2010: 101.2
- 2015: 104.3
- 2020: 107.7

#### GDP growth
- 2001: 8.9
- 2002: 9.5
- 2003: 9.2
- 2004: 8.8
- 2005: 7.1
- 2010: 6.9
- 2015: 6.8
- 2020: 6.8

#### Agriculture
- 2001: 9.5
- 2002: 9.9
- 2003: 9.5
- 2004: 9.0
- 2005: 7.2
- 2010: 7.1
- 2015: 7.0
- 2020: 7.0

#### Industry
- 2001: 13.0
- 2002: 13.6
- 2003: 12.9
- 2004: 12.0
- 2005: 8.6
- 2010: 7.8
- 2015: 7.4
- 2020: 7.4

#### Services
- 2001: 5.9
- 2002: 6.4
- 2003: 6.4
- 2004: 6.3
- 2005: 5.6
- 2010: 5.8
- 2015: 6.0
- 2020: 6.0

#### Consumption growth
- 2001: 8.5
- 2002: 9.0
- 2003: 8.7
- 2004: 8.2
- 2005: 6.5
- 2010: 6.1
- 2015: 5.9
- 2020: 5.9

#### Export growth
- 2001: -13.6
- 2002: 12.3
- 2003: 15.5
- 2004: 16.0
- 2005: 12.7
- 2010: 11.1
- 2015: 11.9
- 2020: 11.9

#### Debt service/exports
- 100%
  - 2001: 8.7
  - 2002: 8.9
  - 2003: 8.9
  - 2004: 9.7
  - 2005: 10.4
  - 2010: 10.1
  - 2015: 16.4
  - 2020: 12.2
- 50%
  - 2001: 8.7
  - 2002: 8.9
  - 2003: 8.5
  - 2004: 8.4
  - 2005: 8.2
  - 2010: 6.7
  - 2015: 9.2
  - 2020: 6.9
- 0%
  - 2001: 8.7
  - 2002: 8.9
  - 2003: 8.2
  - 2004: 7.1
  - 2005: 6.0
  - 2010: 3.2
  - 2015: 1.9
  - 2020: 1.4

#### NPV/exports
- 100%
  - 2001: 167.4
  - 2002: 323.4
  - 2003: 424.5
  - 2004: 475.4
  - 2005: 495.0
  - 2010: 438.4
  - 2015: 358.7
  - 2020: 262.8
- 50%
  - 2001: 151.3
  - 2002: 238.5
  - 2003: 279.8
  - 2004: 295.2
  - 2005: 296.3
  - 2010: 243.1
  - 2015: 179.6
  - 2020: 114.6
- 0%
  - 2001: 135.3
  - 2002: 153.6
  - 2003: 135.0
  - 2004: 115.1
  - 2005: 97.6
  - 2010: 48.9
  - 2015: 37.9
  - 2020: 33.9
4 Low export response

Here the elasticity of exports with respect to GDP is set at 1. As noted above, this parameter is not a demand-side relation but reflects the idea that productive potential for exports grows more or less proportionately with that of exports. The debt-service/export ratio naturally increases more than in the baseline case, but remains manageable even in the most expansionary scenario.

| TABLE A 6.11 4A BASELINE CASE, SCENARIO 1 |
|-----------------|-----------|---------|---------|---------|---------|---------|---------|---------|
| Public expenditure as % of GDP | 20.1      | 22.6    | 23.1    | 22.4    | 22.4    | 22.6    | 22.9    |
| Revenue as % of GDP          | 11.4      | 11.8    | 12.3    | 12.7    | 13.1    | 15.5    | 18.3    | 21.5    |
| Balance of payments          |           |         |         |         |         |         |         |         |
| Exports as % of GDP          | 9.4       | 7.3     | 7.4     | 7.8     | 8.1     | 9.3     | 10.2    | 11.7    |
| Imports as % of GDP          | 27.6      | 27.4    | 27.3    | 25.8    | 25.1    | 21.7    | 18.6    | 16.3    |
| External government financing minus interest | 8.0       | 10.3    | 10.4    | 9.3     | 8.8     | 6.4     | 3.3     | 0.2     |
| Other flows                  | 10.3      | 9.8     | 9.5     | 8.8     | 8.2     | 6.0     | 5.1     | 4.4     |
| Real exchange rate           | 100.0     | 98.4    | 98.7    | 100.2   | 101.1   | 105.2   | 109.1   | 113.0   |
| GDP growth                   | 7.1       | 7.3     | 7.2     | 7.1     | 6.9     | 6.8     | 6.7     |
| Agriculture                  | 7.3       | 7.5     | 7.3     | 7.3     | 7.1     | 6.9     | 6.9     |
| Industry                     | 10.9      | 10.9    | 10.4    | 10.0    | 8.5     | 7.8     | 7.3     |
| Services                     | 4.7       | 4.9     | 4.9     | 5.0     | 5.3     | 5.6     | 5.8     |
| Consumption growth           | 5.3       | 6.3     | 6.2     | 6.2     | 6.0     | 5.8     | 5.6     |
| Export growth                | -15.2     | 8.5     | 10.9    | 11.1    | 9.2     | 8.2     | 9.2     |
| Debt service/exports          |           |         |         |         |         |         |         |         |
| 100%                         | 8.7       | 9.1     | 9.4     | 9.3     | 9.1     | 9.6     | 13.8    | 13.3    |
| 50%                          | 8.7       | 9.1     | 9.0     | 8.5     | 8.0     | 7.0     | 8.4     | 7.9     |
| 0%                           | 8.7       | 9.1     | 8.6     | 7.7     | 6.9     | 4.5     | 2.9     | 2.2     |
| NPV/exports                   |           |         |         |         |         |         |         |         |
| 100%                         | 167.4     | 246.4   | 278.1   | 294.8   | 306.2   | 342.1   | 343.0   | 294.0   |
| 50%                          | 151.3     | 201.4   | 210.2   | 210.6   | 209.0   | 203.9   | 182.5   | 137.9   |
| 0%                           | 135.3     | 156.4   | 142.3   | 126.3   | 111.9   | 67.2    | 49.2    | 41.5    |
The impact of increases in public expenditure on poverty in Rwanda

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5 No HIPC relief
Here the amortisation and interest on old debt is calculated pre-HIPC.

TABLE A 6.14 5A BASLINE CASE, SCENARIO 1

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Balance of payments

- Exports as % of GDP | 9.4 | 7.5 | 7.9 | 8.6 | 9.3 | 12.5 | 16.2 | 21.8 |
- Imports as % of GDP | 27.6 | 27.7 | 27.8 | 26.6 | 26.3 | 24.9 | 24.6 | 26.5 |
- External government financing minus interest | 6.5 | 9.0 | 9.2 | 8.1 | 7.8 | 5.6 | 2.8 | -0.3 |
- Other flows | 11.8 | 11.1 | 10.7 | 9.9 | 9.2 | 6.8 | 5.7 | 4.9 |

Real exchange rate | 100.0 | 98.4 | 98.7 | 100.2 | 101.1 | 105.2 | 109.1 | 113.0 |

GDP growth | 7.1 | 7.3 | 7.2 | 7.1 | 6.9 | 6.8 | 6.7 |
Agriculture | 7.3 | 7.5 | 7.3 | 7.3 | 7.1 | 6.9 | 6.9 |
Industry | 10.9 | 10.9 | 10.4 | 10.0 | 8.5 | 7.8 | 7.3 |
Services | 4.7 | 4.9 | 4.9 | 5.0 | 5.3 | 5.6 | 5.8 |

Consumption growth | 5.3 | 6.3 | 6.2 | 6.2 | 6.0 | 5.8 | 5.6 |
Export growth | -12.4 | 12.2 | 14.6 | 14.9 | 12.9 | 11.8 | 12.8 |

Debt service/exports

- 100% | 30.2 | 30.7 | 28.9 | 25.9 | 23.1 | 15.6 | 13.4 | 9.8 |
- 50% | 30.2 | 30.7 | 28.6 | 25.2 | 22.1 | 13.5 | 9.9 | 6.9 |
- 0% | 30.2 | 30.7 | 28.2 | 24.5 | 21.1 | 11.5 | 6.2 | 3.7 |

NPV/exports

- 100% | 505.9 | 619.7 | 597.7 | 558.4 | 519.4 | 385.3 | 288.7 | 197.2 |
- 50% | 489.0 | 574.1 | 531.4 | 479.0 | 430.8 | 278.7 | 181.9 | 107.2 |
- 0% | 472.1 | 528.6 | 465.2 | 399.5 | 342.3 | 173.3 | 95.0 | 53.9 |


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6 OPEC terms

Here it is assumed that all new lending is at OPEC terms. This case delivers higher debt service-export ratios than the other cases.

### TABLE A 6.17  6A BASELINE CASE, SCENARIO 1

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#### Balance of payments

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