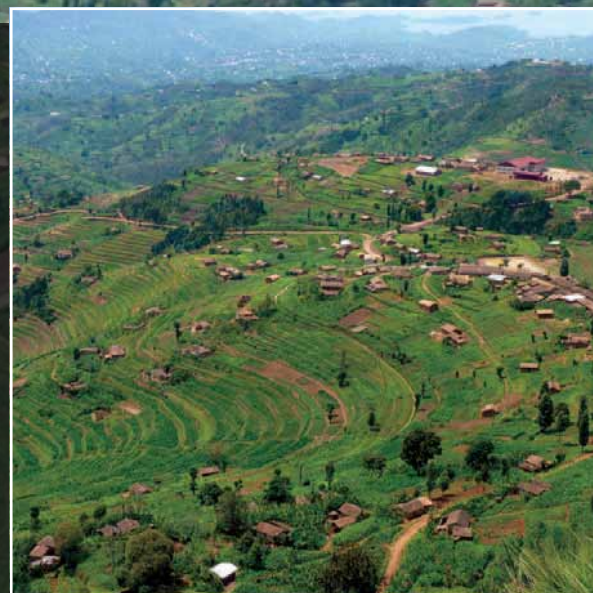


Rwanda Economic Update

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Managing Uncertainty for Growth and Poverty Reduction

With a Special Focus on Agricultural Sector Risk Assessment



WORLD BANK GROUP
Working for a World Free of Poverty

Rwanda Economic Update

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ABBREVIATIONS AND ACRONYMS

BNR	Banque Nationale du Rwanda (National Bank of Rwanda)
CAADP	Comprehensive Africa Agriculture Development Program
COMTRADE	United Nations Commodity Trade Statistics Database
CPI	Consumer Price Index
DRC	Democratic Republic of Congo
EDPRS 2	Second Economic Development and Poverty Reduction Strategy
EICV	Enquête Intégrale sur les Conditions de Vie des Ménages (Integrated Household Living Conditions Survey)
EU	European Union
FAOSTAT	Statistics division at the Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Economic Prospects
IMF	International Monetary Fund
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MTEF	Medium-Term Expenditure Framework
NAEB	National Agricultural Export Development Board
NAP	National Agricultural Policy
NEER	Nominal Effective Exchange Rate
NISR	National Institute of Statistics of Rwanda
OPEC	Organization of the Petroleum Exporting Countries
PSTA	Strategic Plan for the Transformation of Agriculture in Rwanda
PTBF	Prices To Be Fixed
REER	Real Effective Exchange Rate
REU	Rwanda Economic Update
Rwf	Rwandan Franc
UN	United Nations



FOREWORD

The *Rwanda Economic Update* reports on and synthesizes recent economic developments and places them in a medium-term and global context. It analyzes the implications of these developments and policies for the outlook for Rwanda's economy. These reports attempt to make an analytical contribution to the implementation of Rwanda's national development strategy. Each edition includes a special feature on a selected topic. The report is intended for a wide audience, including policy makers, business leaders, other market participants, and the community of analysts engaged in Rwanda's economy.

The seventh edition of the Rwanda Economic Update was jointly prepared by the Rwanda Macroeconomics and Fiscal Management Global Practice and Agriculture Global Practice teams at the World Bank. Toru Nishiuchi (Economist) led the team and the section on recent economic developments. Åsa Giertz (Agricultural Specialist) led the special focus section. Other team members who contributed to the seventh edition are Yoichiro Ishihara (Senior Economist), Tom Bundervoet (Senior Poverty Economist), Valence Kimenyi (Economist), Peace Aimee Niyibizi (Consultant), Mark A. Austin (Program Leader) and Traci Johnson (Consultant). Apurva Sanghi (Lead Economist and Program Leader) supervised the team. Diarietou Gaye (Country Director), Carolyn Turk (Country Manager), Pablo Fajnzylber (Practice Manager), and Albert Zeufack (Practice Manager) provided overall guidance. Sylvie Ingabire (Team Assistant), Maude Jean-Baptiste (Program Assistant), Lydie Ahodehou (Program Assistant), and Barbara Karni (Editor) supported the team. The special focus section synthesizes findings from the two World Bank reports: Agriculture Sector Risk Assessment Volume I (2014) and Promoting Agriculture Growth in Rwanda: Recent Performance, Challenges and Opportunities (2014).

Although this report does not represent the official views of the authorities, the macroeconomic unit of the Ministry of Finance and Economic Planning (MINECOFIN) and the Ministry of Agriculture and Animal Resources (MINAGRI) were engaged in its formulation and provided valuable comments. The Bank team appreciates their contributions.

The findings, interpretations, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the World Bank's Board of Executive Directors or the countries they represent. The World Bank does not guarantee the accuracy of the data included in this report. For more information about the World Bank and its activities in Rwanda, please visit www.worldbank.org/rw. To be included in the email distribution of this semiannual series and related publications, please contact singabire@worldbank.org. For questions and comments about this publication, please contact Toru Nishiuchi (tnishiuchi@worldbank.org).

OVERVIEW

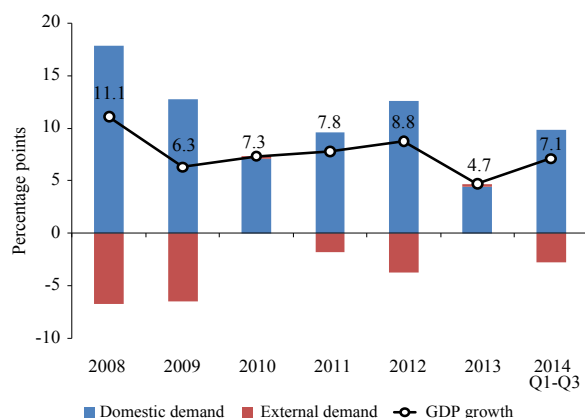
Rwanda's economic growth recovered in the first three quarters of 2014. The economy grew 7.1 percent (year-on-year), 2.4 percentage points faster than in 2013 (Figure 0.1). Faster GDP growth reflected higher growth of the services sector, at 9.1 percent, up from 5.4 percent in 2013, when the economy suffered from the lagged impact of the 2012 aid shortfall.

The first section on macroeconomic issues of this edition of the Rwanda Economic Update (REU-7) examines two key questions: What led to the growth recovery in the first three quarters of 2014, and what are growth prospects for 2014, 2015, and 2016?

What led to the growth recovery in the first three quarters of 2014?

The growth recovery mainly reflected increased government expenditure, which boosted domestic demand such as private consumption and investment (Figure 0.1). Increased government expenditure in 2014 was attributable to delayed execution of capital expenditure and net lending in the first half of the

Figure 0.1: Higher domestic demand was a major cause of growth
(contribution to growth rate)

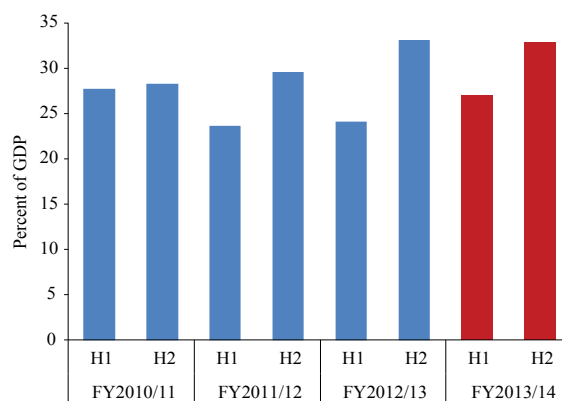


Sources: NISR and World Bank staff calculations.

2013/14 fiscal year between July and December 2013, indicating that higher growth in 2014 was at the expense of slow growth in 2013 (Figure 0.2).¹ Capital expenditure increased by 2.7 percentage points of GDP to 15.2 percent in the second half of the 2013/14 fiscal year between January and June 2014. Net lending (including government investment) increased by 1.5 percentage points of GDP to 1.7 percent in the second half of the 2013/14 fiscal year. Although Rwanda's fiscal policy has been consistent with growth and stability objectives, delayed implementation of capital expenditure and net lending remains as a structural bottleneck as a result of capacity constraints in large line ministries.

The expansion of domestic demand was partially offset by lower external demand for Rwanda's traditional commodities. As a result of declining international prices for Rwanda's traditional export commodities, revenues from exports of goods decelerated significantly. After solid growth of 65.9 percent in 2013, mineral exports contracted 9.9 percent in 2014. The decline caused export growth to slow to 4.7

Figure 0.2: Budget execution was concentrated in the second half of the 2013/14 fiscal year



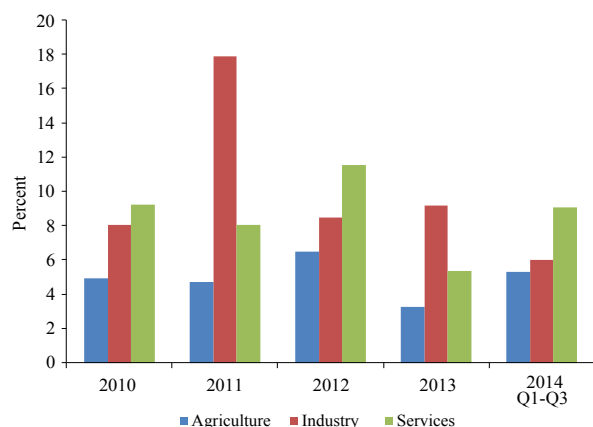
Sources: MINECOFIN and World Bank staff calculations.
Note: H1 covers July–December. H2 covers January–June.

¹ Rwanda's fiscal year runs from July through June.

percent, down from 18.7 percent in 2013. The trade deficit expanded, as the growth of imports outpaced the growth of exports.

Higher government expenditure contributed to growth recovery in the services sector through government consumption of private services (Figure 0.3). Wholesale and retail trade services were the main drivers of growth in the services sector, generating about 17 percent of real GDP growth in 2014. Growth in the industrial sector slowed, as a result of weaker growth in construction and, to a lesser degree, manufacturing. Agriculture, which contributed about 23 percent to GDP growth in 2014, recorded higher growth of 5.3 percent. Favorable weather conditions and expanded cropped area in low lands were the primary causes of the better than expected food harvest.

Figure 0.3: Growth in the services sector recovered, thanks to the increase in government consumption
(year-on-year growth rate)



Sources: NISR and World Bank staff calculations.

Inflation declined throughout 2014, reflecting lower growth in import prices. Lower international energy prices and food prices contributed to declining inflation. Annual average headline inflation—the overall change in the price of the consumption basket—was 1.8 percent in 2014, down from 4.2 percent in 2013. Energy prices increased only 0.6 percent, down from 2.7 percent in 2013. Annual average food inflation declined to 1.3 percent, from 5.1 percent in 2013.

What are growth prospects for 2014, 2015, and 2016?

The World Bank estimates that growth momentum was sustained in the fourth quarter of 2014 and projects that it will continue through 2016. The August 2014 edition of the Rwanda Economic Update projected that Rwanda's economy would grow at 5.7 percent in 2014 and 6.6 percent in 2015. Those projections assumed unfavorable agricultural harvests as a result of adverse weather condition in season B, lower international commodity prices of minerals, and delayed implementation of government investment projects.² During the first three quarters of 2014, the economy recovered, thanks to strong growth in the services sector supported by increased government spending and high agriculture production in seasons A and C. Coincident and leading indicators, such as credit growth to the private sector and imports of capital goods, show that growth momentum remained robust in the fourth quarter of 2014 and will continue to be so in 2015. Ongoing implementation of priority policy areas—agricultural productivity, export capacity, domestic resource mobilization, and expenditure prioritization—will also reinforce growth. In light of these developments, the World Bank revised its growth projections to 7.0 percent for 2014, 7.5 percent for 2015, and 7.7 percent for 2016.

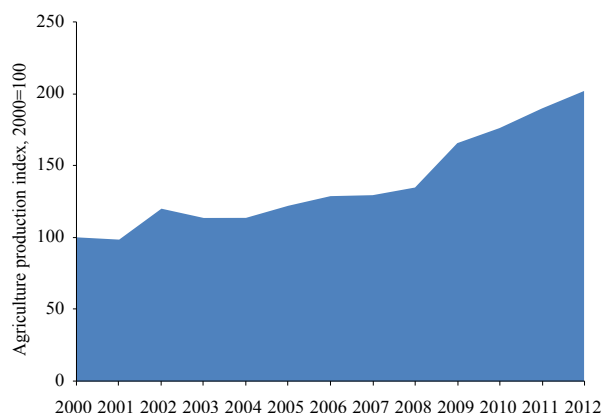
The recent decline in oil prices is expected to contribute not only to lower inflation but also to more stable exchange rate, an improved balance of payments, and smaller electricity subsidies. Macroeconomic stability in turn increases policy flexibility. The direct impacts of lower energy costs on the poor will be limited, however, because their expenses on energy represent a small share of their consumption basket.

² Rwanda's agriculture seasons A, B, and C run from September to February, March to June, and July to August, respectively.

Growth in the agriculture sector has been very strong since 2000

Agriculture production in Rwanda almost doubled between 2000 and 2012, with most of the increase occurring since 2008 (Figure 0.4). Agricultural GDP grew at an average annual rate of 5.4 percent between 2008 and 2013, thanks to impressive performance in the food crop subsector. Significant gains in productivity of selected priority crops were also observed. Between 2008 and 2011, yields (production per hectare) increased 225 percent for maize, 129 percent for wheat, 90 percent for cassava, 66 percent for potatoes, 62 percent for bananas, and 34 percent for rice. Growth in agricultural production accounted for 35 percent of Rwanda's reduction in poverty over the past decade, and increased commercialization of agriculture accounted for another 10 percent.

Figure 0.4: Agricultural production almost doubled in a decade



Sources: FAOSTAT and World Bank staff calculations.

Success has been achieved thanks to the government's National Agricultural Policy (NAP), adopted in 2004, supplemented by its Strategic Plan for the Transformation of Agriculture in Rwanda (PSTA 1 and 2), with support from the Comprehensive Africa Agriculture Development Program (CAADP 1). The goals of the NAP are to contribute to national economic growth, improve food security and the nutritional status of the population, and raise rural incomes. The strategy calls for the

transformation of agriculture into a modern, professionally operated, and market-oriented economic undertaking through promotion of professionalism, specialization, technological innovation, and public-private partnerships.

Having fulfilled PSTA 2/CAADP 1, the government has begun implementing PSTA 3 for 2013–18 and is preparing CAADP 2. The objectives of PSTA 3 are to transform Rwandan agriculture from a subsistence sector to a knowledge-based sector and accelerate agricultural growth in order to increase rural incomes and reduce the incidence of poverty from 45 percent in 2012 to 20 percent in 2020. Other targets for 2020 include (a) increasing external trade (exports plus imports) to 60 percent of GDP, (b) reducing the proportion of the population in the agricultural sector to 50 percent, (c) increasing the share of mechanized agricultural operations to 40 percent, (d) reducing the Gini coefficient from 0.454 to 0.350, (e) increasing the number of off-farm jobs from 200,000 in 2000 to 3.2 million in 2020, (f) providing 100 percent of the population with access to clean water and sanitation, (g) increasing the share of the population living in urban areas to 35 percent, (h) reducing the infant mortality rate to 27 percent, and (i) achieving a literacy rate of 100 percent.

To achieve the targets under PSTA 3, it is important to identify lessons learned and remaining risks from previous programs

Despite recent gains, Rwanda's agriculture sector faces structural bottlenecks, which could expose the agriculture sector to risks. Agricultural land plots are very small (80 percent of land holdings are less than 1 hectare, often divided into three or four plots), and more than 70 percent of agricultural land is on hills or the sides of hills, making it hard to make space for mainstream commercial agriculture. Agriculture is dominated by small-scale, subsistence farming under traditional agricultural practices and rain-fed agriculture. Irrigation is underdeveloped and not yet widespread, use of improved seed is still

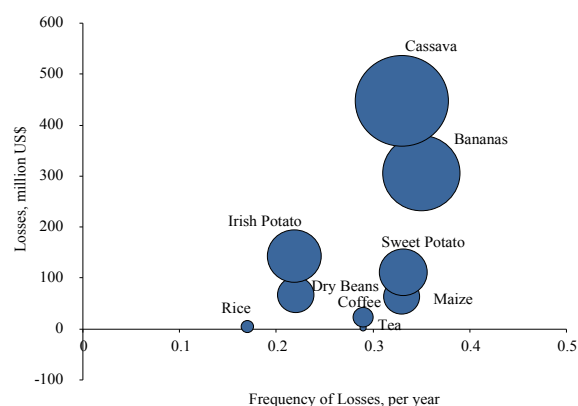
constrained, and only one-third of farmers are using fertilizers, though the figure is rising. As a result, average crop yields are low.

Effective measures to manage risks contribute to further growth in the agriculture sector

The special focus section of this report identifies and quantifies risks in the agriculture sector, with targeted interventions that complement the lessons learned under PSTA 2/CAADP 1 to more effectively manage these risks and to achieve further growth in the agriculture sector. Although agricultural risks are low in Rwanda compared to neighboring countries, they have important consequences for sector productivity, growth, and the government's efforts to transform the sector. Risks to the agricultural sector caused production losses worth US\$1.2 billion between 1995 and 2012, about 2.2 percent of Rwanda's total annual agricultural production (Figure 0.5).

Identifying risks and prioritizing interventions for identified risks are important first steps in designing a set of comprehensive and effective measures to manage them and to

Figure 0.5: Losses in 1995–2012 were greatest for cassava and bananas



Sources: FAOSTAT and World Bank staff calculations.

meet the government's targets under PSTA 3/CAADP 2. Based on frequency and severity, the main risks to Rwanda's agricultural sector are regarded as pests, disease, and weather-related risks for crops and livestock and price volatility for export crops and dairy producers (Table 0.1). The impacts of pests and disease are expected to rise as a result of increased mono-cropping, land consolidation, use of storage, and higher growth in the livestock subsector. The impacts of adverse weather conditions, such as drought and erratic

Table 0.1: Risk prioritization matrix for Rwanda's agriculture sector

Probability of event	Impact of risk		
	Low	Moderate	High
High (1 year in 3)	- Potato taste (coffee) - Landslide (all crops) - Local and large-scale floods (all crops) - Milk contamination (dairy) - Power cuts at milk collection centers (dairy) - Counterparty risk (coffee) - Price volatility (food crops and milk) - Exchange rate volatility (export crops)	- Price volatility (export crops) - Disease outbreaks (livestock)	- Pests and diseases (all crops) - Drought and erratic rains (all crops and livestock)
Moderate (1 year in 5)	Hail (all crops)		
Low (1 year in 10)	- Glut (dairy) - Frost (tea) - Losses in transit (tea) - Aflatoxins in feed (livestock) - Maize shortage (dairy)		

Source: World Bank Agriculture Risk Management Team.

Note: Data on some crops and some risks were not available. This table is therefore not exhaustive. The ranking of risks is based on the team's evaluation based on both data analysis and on-the-ground research.

rains, will remain high if measures to address underdeveloped irrigation are not addressed. Price volatility will continue to affect producers of export crops and dairy products unless an improved market information system and risk-hedging mechanisms are put in place.

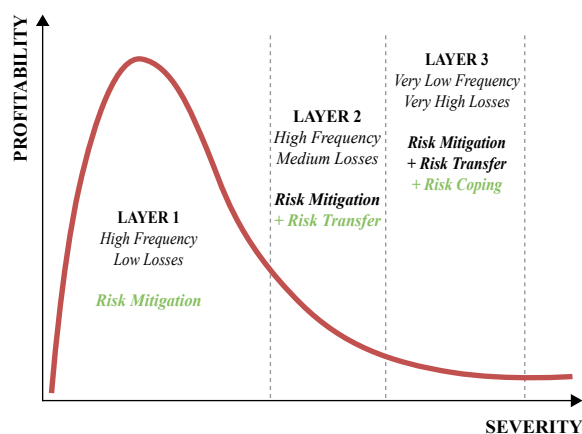
The government could implement targeted interventions to more effectively manage risks and to achieve further growth in the agriculture sector. As the potential interventions identified below are mainly risk-mitigating mechanisms, they are win-win in nature, contributing to improved agricultural productivity for many producers and general agricultural growth in the sector:

- Risk mitigation measures are ex ante actions designed to reduce the likelihood of risk or the severity of losses. Such measures are often win-win practices, in that they reduce the impacts of agricultural risks on farmers while at the same time improving productivity. Examples include soil and water conservation measures; changes in cropping patterns; adoption of practices that improve performance and reduce risks, such as use of conservation farming, short cycles, and tolerant varieties; and creation of improvement of irrigation and flood control infrastructure.
- Risk transfer measures are ex ante actions that transfer the risk to a willing third party for a fee. These mechanisms usually trigger compensation in the case of a risk-generated loss. They include insurance, reinsurance, and financial hedging tools.

- Risk coping measures are ex post actions that help the affected population and the government cope with loss. They usually take the form of compensation (cash or in-kind), social protection programs, and livelihood recovery programs (for example, government assistance to farmers, debt restricting, and contingent financing).

Instruments applied for a given risk depends on the probability of the risk and the severity of its impact (Figure 0.6). Any risk strategy will likely include a combination of all three types of risk management instruments. Joint implementation has positive, complementary impacts while addressing multiple risks and contributing to improved risk management in the short, medium and long terms. Implementing risk management interventions will require integrating risk management approaches in existing policies and programs and a risk management plan.

Figure 0.6: The choice of strategic risk instrument depends on both the probability and severity of the risk



Source: World Bank Agricultural Risk Management Team.

PART ONE

Recent Economic Developments and Prospects



Average real growth in Rwanda exceeded 8 percent a year over the past decade, one of the highest rates in the world. The services sector contributed more than half of the increase in GDP. Large inflows of foreign aid financed government expenditure, which in turn stimulated the service sector. The government effectively channeled aid for economic development and poverty reduction. The contribution of the services sector was preserved despite the aid shortfall in 2012, enabling the economy to grow 8.8 percent in 2012. The aid shortfall and resulting delays in budget executions in the second half of 2012 contributed to growth deceleration in 2013, however. Growth in the services sector fell from 11.5 percent in 2012 to 5.4 percent in 2013. As a result, the economy grew just 4.7 percent in 2013, the lowest rate since 2003.

The aid shortfall and the resulting economic slowdown revealed structural bottlenecks.

Aid accounts for 30 to 40 percent of the budget. Aid finances public investment, accounting more than 50 percent of total investment. Because of heavy reliance on aid and the dominance of the public sector in the economy, the narrower fiscal space created by the aid shortfall had not only the direct effect of slowing down government expenditure but also a significant indirect effect on private sector economic activity. The services and construction sectors were especially hard hit by reduced public sector activity and the crowding-out of credit to the private sector as a result of increased domestic borrowing to finance the budget by the government. The poor harvest in 2013 further subdued growth, highlighting the vulnerability of Rwanda's rain-fed agriculture

to adverse weather conditions. Although mining sector exports were impressive, that sector's performance is vulnerable to fluctuations in international commodity prices, as evident in the sharp drop in export growth in 2014.

Given a possible decline in the share of aid in the economy in the medium term, the role of public expenditure is expected to shift from driving growth to catalyzing it. Maintaining high growth will require a shift from an aid-dependent, public sector-led development process to growth driven by the private sector. Such a structural transformation will depend on addressing constraints to private investment and continuing to make effective and efficient use of public resources through enhanced public financial management. In particular, it will be important to mobilize additional domestic resources to create fiscal space and to further prioritize expenditures, including through improved public investment management. For growth to be accompanied by faster poverty reduction, further progress in policy reforms will be needed in a number of areas. This includes the accountable governance pillar of the government's medium-term plan, encompassing not only enhanced public financial management but also more effective decentralization, in order to ensure greater equality in the delivery of public services. Continued growth in agricultural productivity and the establishment of an extensive and effective social protection system will sustain or even accelerate the rate of poverty reduction by supporting the incomes of the poorest and most vulnerable Rwandans (see Box 1.1 for input-output table analysis).



Box 1.1 What does the input-output table reveal about Rwanda's economy?

The input-output (I-O) framework provides a comprehensive picture of the flows of goods and services in an economy for a given year. Rwanda's National Institute of Statistics of Rwanda (NISR) constructed the I-O framework for 2011 when it rebased the national account in 2014.

The I-O framework reveals the link between the production and expenditure accounts (Box table 1.1.1). On the supply side, total output by the agriculture sector was Rwf 1,327 billion, including intermediate inputs of Rwf 82 billion. Total value added was thus Rwf 1,245 billion. On the demand side, of total output value of Rwf 1,327 billion, Rwf 414 billion was used as intermediate inputs (including Rwf 32 billion for the agriculture sector). Total final demand was thus Rwf 913 billion, of which Rwf 881 billion was domestic and Rwf 26 billion net external demand. Of total production of Rwf 1,327 billion, Rwf 414 billion (31 percent) was used as intermediate inputs; the remaining Rwf 913 billion (69 percent) was for final demand. In the industry sector, about 70 percent of total outputs were used for intermediate inputs (including for the industry sector). The share of final demand was 31 percent.

Box table 1.1.1: I-O table for Rwanda, 2011*(Rwf billions)*

			Demand														Total output
			Intermediate				Final demand										
			Agriculture	Industry	Services	Total	Household	Gov't / NGO	Investment	Others (-)	Domestic demand	Exports	Imports	External demand	Total		
Supply	Intermediate	Agriculture	32	343	39	414	908	0	53	80	881	78	52	26	913	1,327	
		Industry	40	641	507	1,188	1,173	0	840	718	1,295	196	946	-750	546	1,734	
		Services	10	190	637	837	856	616	12	-535	2,019	250	141	109	2,134	2,971	
		Total	82	1,174	1,183	2,439	2,937	616	905	263	4,195	524	1,139	-615	3,593	6,032	
	Gross value added		1,245	560	1,788	3,593											
	Total output		1,327	1,734	2,971	6,032											

Sources: NISR and World Bank staff calculations

Input coefficients show the shares of intermediate materials of a sector per output (Box table 1.1.2). For the economy as a whole, the share of intermediate inputs was 40 percent. This means that out of the total output value, 40 percent was intermediate inputs and 60 percent gross value added. These ratios differ widely across sectors. The intermediate input ratio was high in industry (68 percent) and low in agriculture (6 percent). These figures reflect the fact that industry requires many inputs, including imported materials. These figures indicate that an increase in agriculture outputs would directly contribute to GDP.

Box table 1.1.2: Input coefficients for Rwanda, 2011

Item	Sector			
	Agriculture	Industry	Services	Total
Intermediate from Agriculture	2	20	1	7
Intermediate from Industry	3	37	17	20
Intermediate from Services	1	11	21	14
Total Intermediate	6	68	40	40
Gross value added	94	32	60	60
Total output	100	100	100	100

Sources: NISR and World Bank staff calculations.

1.1 Growth Recovery in the Real Sector

Rwanda's economy recovered from the lagged impact of the aid shortfall in 2013.

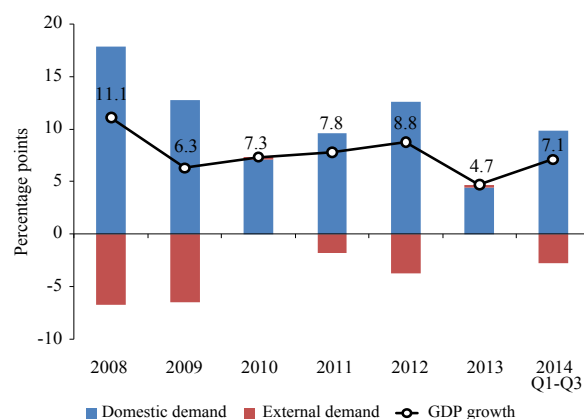
Growth accelerated from 4.7 percent in 2013 to 7.1 percent in the first three quarters of 2014 (7.5 percent in the first quarter, 6.1 percent in the second quarter, and 7.8 percent in the third quarter). This growth exceeded the projections of the August 2014 edition of the Rwanda Economic Update (REU-6) of 5.7 percent. That projection was based on weak coincident indicators of economic activities, such as unfavorable agricultural production as a result of adverse weather condition; lower growth in cement consumption and wholesale and retail trade, reflecting delayed implementation of government investment and consumption; and stagnant credit growth to the private sector.

Domestic demand, supported by higher government spending in the first half of 2014, led the growth recovery. Acceleration in government spending and a moderate increase in private consumption led to growth in the services sector, which represents 45 percent of Rwanda's GDP. Higher government spending between January and June 2014, however, is attributable to catching-up of delayed implementation of the 2013/14 fiscal year budget between July and December 2013 due to capacity constraints on executing capital expenditure by ministries with large budgets. This indicates that economic growth in the first three quarters of 2014 was compensating for lower growth in the second half of 2013. As a result of favorable rainfall in the first agriculture season (season A) and increased cropped area of marshlands in the third (season C), agriculture growth improved significantly, contributing to the recovery of the overall growth rates. On the negative side, the decline in external demand (exports minus imports), reflecting decelerated growth in exports as a result of lower international prices for Rwanda's major export items, muted economic growth.

a. Expenditure Account

Recovery of domestic demand was the main driver of growth in the first three quarters of 2014 (Figure 1.1). The expenditure account consists of domestic demand (private consumption, government consumption and gross fixed capital formation (i.e., investment)) and external demand (exports minus imports). Domestic demand contributed 9.9 percentage points to the overall growth rate of 7.1 percent. External demand reduced growth by 2.8 percentage points.³

Figure 1.1: Higher government consumption was a major cause of growth
(contribution to growth rate)



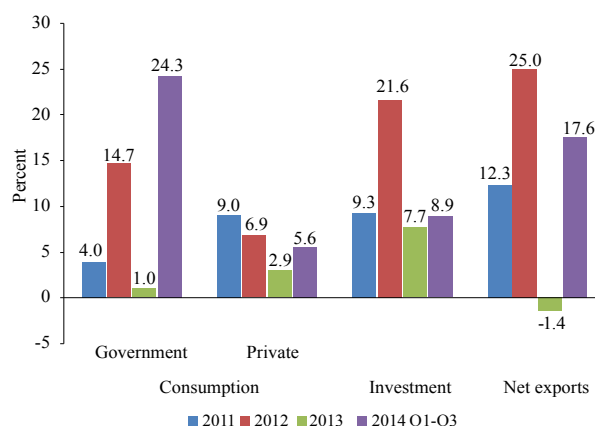
Sources: NISR and World Bank staff calculation.

Consumption expanded by 8.5 percent, returning to the level observed before the 2012 aid shortfall. Government consumption growth accelerated from 1.0 percent in 2013 to 24.3 percent in the first three quarters of 2014, reflecting increased current expenditures (Figures 1.2 and 1.3). Private consumption expanded from 2.9 percent in 2013 to 5.6 percent. Investment accelerated from 7.7 percent in 2013 to 8.9 percent, led mainly by investment in durable goods, particularly related to farm mechanization.⁴ Growth of construction investment decelerated to 7.2 percent in the first

³ In REU-6 the team relied on data published by the National Institute of Statistics Rwanda (NISR) in March 2014. Those data indicated that domestic demand slowed and external demand led the economy in 2013. The September 2014 revision revealed that external demand only marginally contributed to economic growth and domestic demand fully led the economy in 2013.

⁴ Data that are disaggregated into private and public investment are not available on a quarterly basis.

Figure 1.2: The increase in government consumption was robust (year-on-year growth rate)



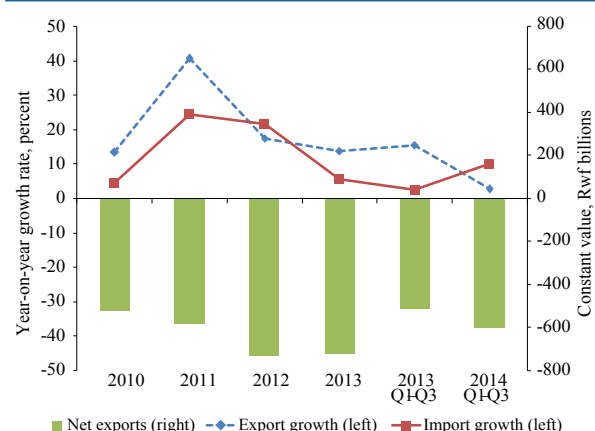
Sources: NISR and World Bank staff calculations.

Note: Because net exports in 2013 were negative, positive growth in 2014 indicates that the net exports deficit expanded in 2014.

three quarters of 2014, down from 11.0 percent in 2013, as a result of continued delays in government construction projects.

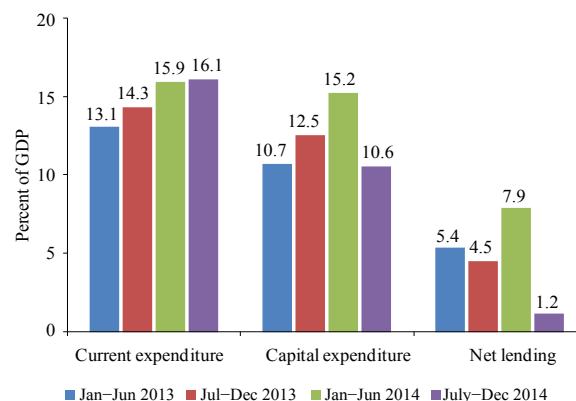
A sharp drop in export growth and higher import growth caused net exports to deteriorate (Figure 1.4). In the first three quarters of 2014, net exports deteriorated by 17.6 percent over the same period in 2013. Exports grew 2.7 percent (year-on-year), down from 13.7 percent in 2013. Lower export growth was attributable to both flat growth in the production of export crops (coffee

Figure 1.4: Net exports deteriorated



Sources: NISR and World Bank staff calculations.

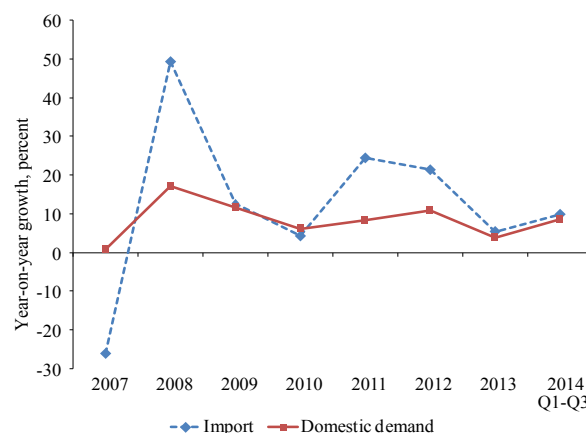
Figure 1.3: Government expenditure was high in the first half of 2014



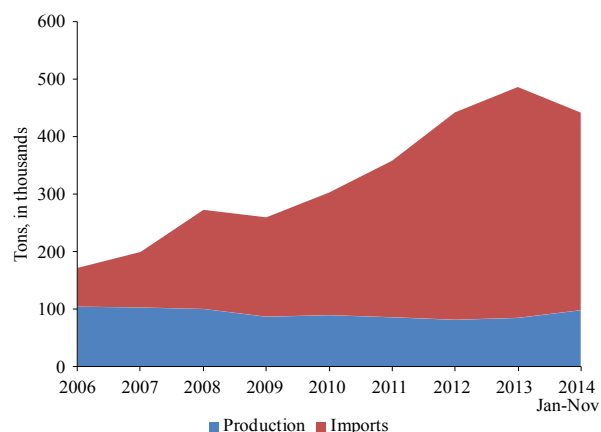
Sources: MINECOFIN and World Bank staff calculations.

and tea) and lower international commodity prices for them. Import growth accelerated to 9.9 percent in the first three quarters of 2014, up from 5.5 percent in 2013. Stronger import growth reflects improved domestic demand supported by increased government expenditure. Because of Rwanda's high reliance on imports, domestic demand and imports are highly correlated (Figure 1.5). The decelerated growth of construction investment reflects the decrease in cement imports (Figure 1.6). Cement imports grew 32.5 percent in 2012 and 11.3 percent in 2013.

Figure 1.5: The increase in imports reflected high domestic demand



Sources: NISR and World Bank staff calculations.

Figure 1.6: Slower growth in construction slowed cement imports

Sources: BNR and World Bank staff calculations.

b. Production Account

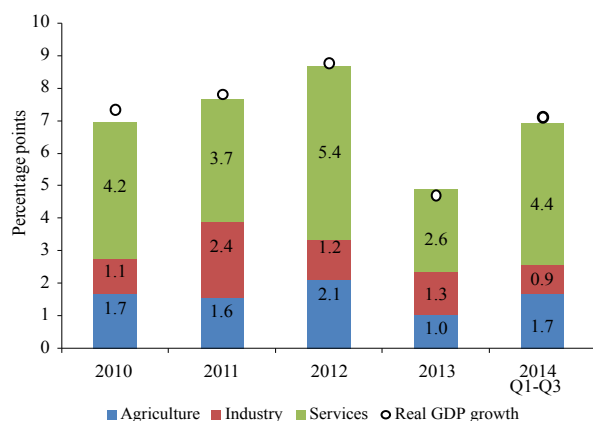
Strong growth in the services sector supported by higher government consumption was the main factor behind the growth recovery in the first three quarters of 2014 (panel a of Figure 1.7). The services sector has been the single biggest contributor to economic growth since 2003 and its accounts for 47 percent of GDP, grew 9.1 percent in the first three quarters of 2014, up from 5.4 percent in 2013. Due to the high share in the economy and high growth, the service sector contributed to the overall growth by 4.4 percentage points out of 7.1 percent in the first three quarters of 2014, up from 2.6

percentage points out of 4.7 percent in 2013. Higher government consumption in the first half of 2014 accounted for the growth acceleration (panel b of Figure 1.7).

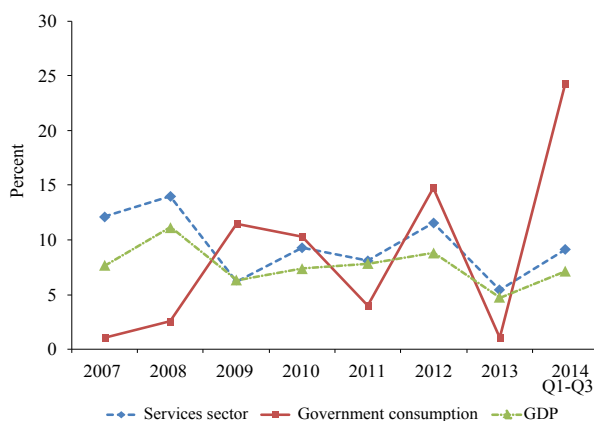
Growth accelerated in both the public and private sector services in the first three quarters of 2014 (Figure 1.8). In the services sector, public services (public administration, health, and education) accounted for 19 percent of growth, and private services accounted for 81 percent. While the share of public services is small, the government is the biggest consumer of private services. Thus, increased government consumption also stimulates private services. Growth in both public and private sector services sharply decelerated in 2013, led by the sharp reduction in government consumption and continued contraction in private consumption. In the first three quarters of 2014, growth in both private and public sector services accelerated, thanks to sharply increased government consumption and moderately increased private consumption. In private services, wholesale and retail trade (26 percent of the sector) and real estate activities (12 percent) were the major subsectors. Growth in the wholesale and retail trade subsector increased from 5.8 percent in 2013 to 9.7 percent in the first three quarters 2014, reflecting recovery in the volume of Rwanda's international trade.

Figure 1.7: Increased government consumption boosted the services sector, which accounted for most of the growth recovery in the first three quarters of 2014

a. Sectoral contributions to growth, 2010–14



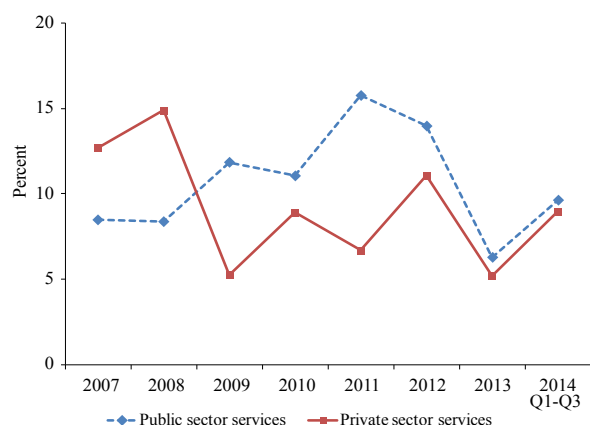
b. Annual changes in services sector output, government consumption, and GDP, 2007–14



Sources: NISR and World Bank staff calculations.

Real estate activities grew 8.4 percent, up from a mere 1.1 percent in 2013, reflecting credit growth to the commerce, business, and hotel subsectors.

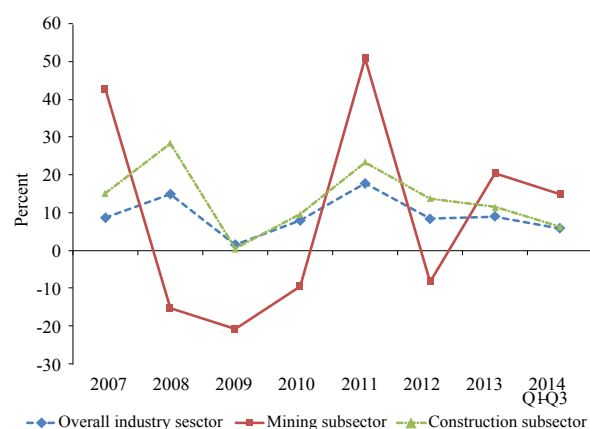
Figure 1.8: Growth in the services sector recovered



Sources: NISR and World Bank staff calculations.

Growth in the industry sector slowed in the first three quarters of 2014 (Figure 1.9). The sector expanded by 6.0 percent in the first three quarters of 2014, down from 9.2 percent in 2013. This rate of expansion was the lowest since 2009. Weaker growth in the construction subsector accounted for the poor performance. Construction, which represents 50 percent of the industry sector, expanded by 6.4 percent in the first three quarters of 2014, down from 11.5 percent in 2013, reflecting slower growth in construction investment as a result of continued delays in government construction projects. Average growth in the subsector between 2007

Figure 1.9: Growth in industry was weak



Sources: NISR and World Bank staff calculations.

and 2013 was 14.7 percent. Weak growth is reflected in the 6.1 percent decline in imported cement in the first three quarters of 2014.

The mining subsector grew 15.0 percent in the first three quarters of 2014. Boosted by seven new mining investments in 2013, it grew 20.6 percent in 2013 (see the special focus in REU-6). Foreign direct investment sustained this growth in 2014. In September the government awarded a 25-year mining license to Tinco, a Canadian mining company, to operate in Nyakabingo and Rutongo Provinces. Tinco committed to invest US\$7 million. At the Rutongo concession, it committed to increase monthly production of cassiterite from 60 tons in 2013 to 90 tons in 2015 and 120 tons in 2016.

Growth in the manufacturing subsector weakened, as activity in beverages and tobacco contracted. Growth in the manufacturing subsector fell to 2.4 percent in the first three quarters of 2014, after growing 4.6 percent in 2013. Most subsectors showed no growth. Beverage and tobacco production was severely hit by movement restrictions between the Democratic Republic of Congo (DRC) and Rwanda. According to the annual economic report by the Ministry of Finance and Economic Planning (MINECOFIN), soft drink production declined because exports to the eastern DRC by Brasseries et Limonaderies du Rwanda (BRALIRWA) stopped in April 2014, following complaints from a Congolese company producing the same products.

Manufacturing other than furniture production remains small. Lack of adequate infrastructure, especially electricity and transport routes, and a low skill base, together with Rwanda's landlockedness, limit investment in manufacturing. Addressing these constraints requires prioritization of expenditures, including through improved public investment management, and provision of targeted vocational training to build basic skills.

The agriculture sector expanded by 5.3 percent in the first three quarters of 2014, up from 3.2 percent in 2013. It accounted for 1.7 percentage points of growth, up from 1.0 percentage points in 2013. Growth came from food crops, which accounted for 69 percent of total agriculture production. The value of food crops increased 6.0 percent in the first three quarters of 2014, up from 3.5 percent in 2013, thanks to sufficient rainfall in season A. Increased cropped area of marshlands in season C boosted growth in the third quarter. Export crops (coffee and tea) registered no growth in the first three quarters of 2014, after declining 5.8 percent in 2013.

The rain-fed nature of Rwanda's agriculture, one of Rwanda's structural bottlenecks, leaves

harvests vulnerable to adverse weather shocks, which in turn poses weather-related production risks to farmers and the economy. Thorough analysis of risks to Rwanda's agriculture is the first step to manage risks to the agriculture sector (see the special focus section of this report). Structural reforms and investment based on the analysis are likely to improve the chances of steady and stable growth in the medium term. Various policy actions, including legislative reform; investment in rural infrastructure (feeder roads, markets, and postharvest storage facilities); education in specialized agricultural skills; and land administration reform could raise productivity, increase agricultural incomes, and sustain rapid poverty reduction.

1.2 The External Sector: Widening Trade Deficits

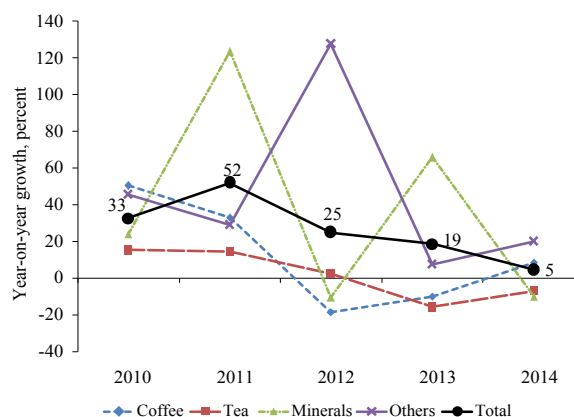
Rwanda's formal trade balance in goods deteriorated in 2014, as a result of weak performance in traditional export products (primarily coltan) and stronger import demand. Weak export performance mainly reflected the sharp fall in international commodity prices. The tourism sector remained the largest single source of foreign currency. Strong import demand caused the level of gross international reserves to fall in the first half of 2014.

Trade in Rwanda is characterized by a highly concentrated export basket and a chronic large trade deficit. Goods exports averaged 8.3 percent of GDP, imports 25.4 percent, and the trade deficit 17.2 percent in 2011–13. The export basket is dominated by a small number of traditional commodities, with coffee, tea, and minerals accounting for 60 percent of goods exports. This level of concentration, another structural bottleneck, leaves Rwanda highly vulnerable to fluctuations in international commodity prices. On the import side, Rwanda's limited domestic production capacity leaves it heavily reliant on imported capital and intermediate goods.

The formal trade deficit widened in 2014, because import growth exceeded export growth. Exports expanded by just 4.7 percent, to US\$600 million, as a result of weak performance in traditional export products, especially minerals

(Figure 1.10). Mineral exports contracted by 9.9 percent, to US\$203 million, after growing 65.9 percent in 2013. The share of mineral exports to total exports fell from 39.4 percent in 2013 to 33.9 percent in 2014. The contraction of

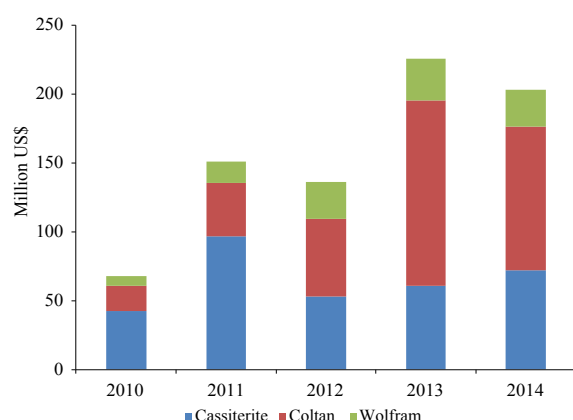
Figure 1.10: Total export growth slowed, as a result of the decline in mineral exports



Sources: BNR and World Bank staff calculations.

mineral exports was attributable to unfavorable international commodity prices, especially for coltan (Figure 1.11 and Table 1.1). The value of coltan exports contracted 22.1 percent, driven by the 16.6 percent fall in its average price. The share of coltan exports to total exports (17.5 percent) and mineral exports (51.4 percent) also declined, from 23.5 percent for coltan and 59.6 percent for all minerals in 2013. Although the mining subsector registered very strong growth and exports in 2013, its performance is vulnerable to fluctuations in international commodity prices, as evident in 2014 (see Box 1.2 for exports and fluctuations of international commodity prices).

Figure 1.11: The value of coltan and wolfram exports fell



Sources: BNR and World Bank staff calculations.

Table 1.1: Mineral exports by Rwanda, 2011–14
(year-on-year percent change)

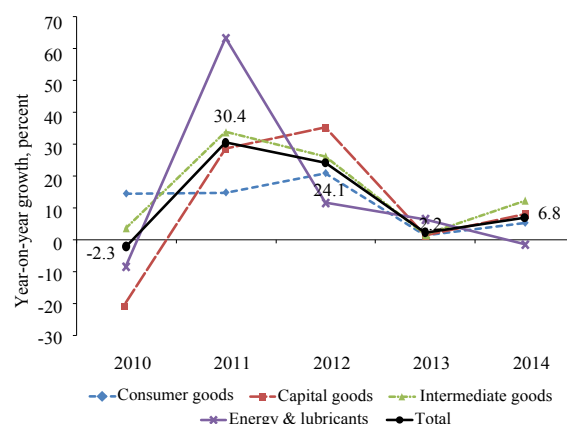
Item	2011	2012	2013	2014
Value (US\$)				
Total	123.4	-10.1	65.9	-9.9
Cassiterite	129.4	-45.4	15.5	17.8
Coltan	108.8	47.5	136.5	-22.1
Wolfram	125.7	63.9	14.4	-11.5
Price (US\$/kg)				
Cassiterite	27.8	-18.1	9.4	-3.1
Coltan	75.6	14.7	9.8	-16.6
Wolfram	89.2	-5.8	-9.7	-11.4
Volume (tons)				
Cassiterite	79.4	-33.3	5.6	21.6
Coltan	18.9	28.6	115.4	-6.6
Wolfram	19.3	74	26.7	-0.2

Source: BNR and World Bank staff calculations.

Coffee exports expanded by 9.8 percent, to US\$59.7 million, in 2014, after contracting by 9.8 percent in 2013. In contrast, tea exports continued to contract, falling by 6.7 percent, to US\$51.8 million. The share of coffee exports in total exports fell from 22.0 percent in 2010 to 10.0 percent in 2014, and the share of tea exports fell from 21.9 percent in 2010 to 8.6 percent. The decline in the share of coffee and tea was attributable to the very strong growth of mineral exports. Coffee and tea retained their importance in the economy, however, as the value of coffee and tea exports and the share of export crops in GDP remained unchanged.

Import values expanded by 6.8 percent as of November 2014, after rising 2.2 percent in 2013 (Figure 1.12). The expansion was attributable largely to the acceleration in imports of capital, which grew 11.0 percent, and intermediate goods, which grew 14.0 percent. As a result, the formal trade deficit expanded by 7.7 percent, to US\$1,320 million, in 2014, up from US\$1,225 in 2013.

Figure 1.12: Import growth rebounded



Sources: BNR and World Bank staff calculations

Import volume increased 3.7 percent (year-on-year) in 2014. The volume of cement imports declined 3.5 percent, leading to deceleration in the growth of intermediate goods imports (from 8.5 percent in 2013 to 2.9 percent in 2014). In contrast, the volume of imports of consumer goods (4.9 percent), capital goods (3.0 percent),

Box 1.2 Diversifying the export base would reduce the impact of volatility of export prices

The growth of goods export slowed to just 4.9 percent in the first 11 months of 2014, down from 18.7 percent in 2013. Export values declined in tea, coltan, and wolfram. The declines in tea and wolfram exports were led by price drops; for coltan, both price and volume fell. Coffee, tea, and minerals accounted for 53 percent of goods exports (73 percent excluding reexports). Performance of goods exports thus depends on the export prices of traditional commodities.

Have Commodity Prices Become More Volatile?

Prices of traditional commodities were more volatile in 2010–14 than in 2004–06 (Box table 1.2.1). Prices of coffee, coltan, and wolfram were more volatile even than in 2007–09, when global commodity prices plummeted as a result of the global financial crisis.

Does Volatility Differ across Commodities?

Mineral prices, especially for coltan, were much more volatile than coffee and tea prices throughout the period. The share of minerals in total traditional commodities skyrocketed in 2013 and 2014 (Box Figure 1.2.1). Changes in mineral prices therefore had a greater impact on traditional commodity exports. Prices of other exports have been mostly stable since 2007.

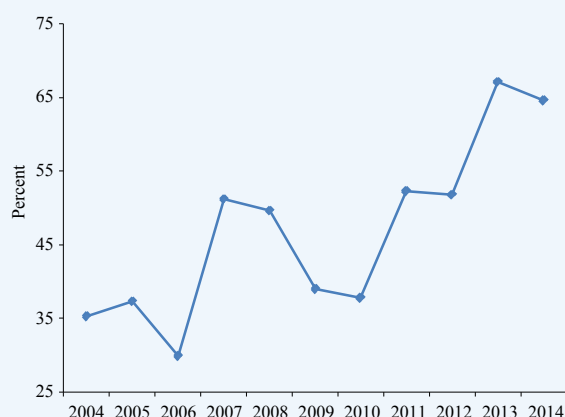
Are the Prices of Rwanda's Main Commodity Exports Correlated?

Export prices of traditional commodities are highly and positively correlated—that is, prices of all traditional commodities move in the same direction (Box table 1.2.2). In contrast, prices of traditional commodities are negatively correlated with other exports.

The increase in price volatility and the high correlations across traditional commodities mean that Rwanda's export composition exposes it to high risk to price changes. Diversification of exports has become more important than the past.

Box table 1.2.1: Prices of Rwanda's commodity exports, 2004–06 through 2010–14*(standard deviation of monthly unit export prices)*

	2004–06	2007–09	2010–14
Coffee	0.50	0.47	0.92
Tea	0.20	0.42	0.29
Cassiterite	0.76	2.22	1.80
Coltan	2.96	6.94	8.78
Wolfram	1.73	1.67	2.57
Other exports	0.83	0.18	0.12

*Sources: BNR and World Bank staff calculations.***Box figure 1.2.1: The share of mineral exports in Rwanda's total traditional commodity exports has increased since 2010***Sources: BNR and World Bank staff calculations.***Box table 1.2.2: Correlations of prices of Rwanda's export commodities**

	Coffee	Tea	Cassiterite	Coltan	Wolfram	Other exports
Coffee	1.00					
Tea	0.58	1.00				
Cassiterite	0.72	0.73	1.00			
Coltan	0.68	0.64	0.77	1.00		
Wolfram	0.77	0.66	0.77	0.82	1.00	
Other exports	-0.30	-0.35	-0.30	-0.28	-0.28	1.00

Sources: BNR and World Bank staff calculations.

and energy-related products (3.4 percent) rose. The decline in cement imports was attributable to continued delays in new construction activities, including the Kigali Convention Center. The

volume of energy product imports rose, although the value fell 1.4 percent, as a result of the sharp fall in oil prices (Section 1.5 discusses the impact of the recent fall in oil prices on the economy).

Tourism continues to be the leading source of foreign exchange, but the sector lost momentum in the first half of 2014. Tourism receipts increased 2.7 percent, to US\$146 million, down from a 13.0 percent increase in the first half of 2013. This weak growth was attributable mainly to the smaller increase in tourist arrivals. During the first half of 2014, tourist arrivals increased just 6.1 percent, to 588,610, down from a 13.8 percent increase in the same period of 2013. Arrivals for leisure declined 5.3 percent, and arrivals for business purposes declined 9.5 percent. The drop in tourist arrivals for business reflects movement restrictions between the DRC and Rwanda that were in effect through August

2014. In the first half of 2014, tourist arrivals for business from the DRC declined 24 percent, to 72,749. The restrictions also affected transit arrivals from other African countries to the eastern DRC. The number of African arrivals for transit purpose declined 11 percent, to 8,492.

Gross international reserves continued to decrease from their peak in December 2013, falling by US\$123 million to US\$946 million in June 2014. They still cover about four months of imports, however, a level consistent with the optimal level of reserves in low-income countries and the target set by the East African Community convergence criterion (IMF 2014).

1.3 Inflation, the Monetary Sector, Exchange Rate Policy, and Financial Sector Development: Growing Credit after a Prolonged Deceleration

Inflation remained low in 2014, as a result of lower import prices, especially for energy and food products. Although the Rwandan franc continued to depreciate moderately throughout 2014, Rwanda's import prices remained low, thanks to lower global commodity prices. Economic recovery in the first three quarters of 2014 and subsequent improvement in financial sector soundness resulted in the slow but steady recovery of credit growth to the private sector since the first quarter of 2014.

Rwanda's monetary and exchange rate policy framework is consistent with macroeconomic stability and growth targets. The National Bank of Rwanda (BNR) has strengthened its liquidity management framework to enhance the effectiveness of monetary policy and improve the monetary policy transmission mechanism. Its prudent monetary policy, together with low international food and energy prices, helped limit inflationary pressure. Exchange rate policies have been geared toward greater exchange rate flexibility since the introduction of an exchange rate corridor framework in March 2010. The exchange rate regime is classified as de facto crawl-like and de jure floating. The financial sector remained stable until the first half of 2013. It appears resilient to shocks, although it was affected by the aid decline in the second half of 2013, as reflected in the slight increase in the ratio of nonperforming loans and the deceleration of credit growth to the private sector.

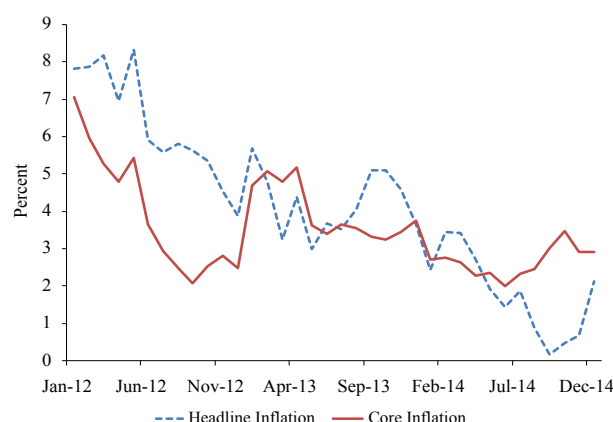
a. Inflation

Inflation rates continued to fall in 2014, thanks to falling food and fuel prices (panel a of Figure 1.13). Annual average headline inflation—the overall change in the price of the consumption basket—was 1.8 percent in 2014, down from 4.2 percent in 2013 (see Box 1.3 for detailed analysis of inflation). Annual average food inflation declined to 1.3 percent, from 5.1 percent in 2013. Declining food prices throughout 2014 reflected a good food crop harvest in season A. Deflation of 3.3 percent in October was attributable to increased cropped area for marshlands in season C.⁵ As a result, producer prices fell 1.1 percent in the first nine months of the year. Energy prices remained low and stable thanks to lower international fuel prices and declines in administrative gasoline prices (see section 1.5 on the impact of changes in oil prices). Energy prices increased only 0.6 percent, down from 2.7 percent in 2013 (panel b in Figure 1.13).

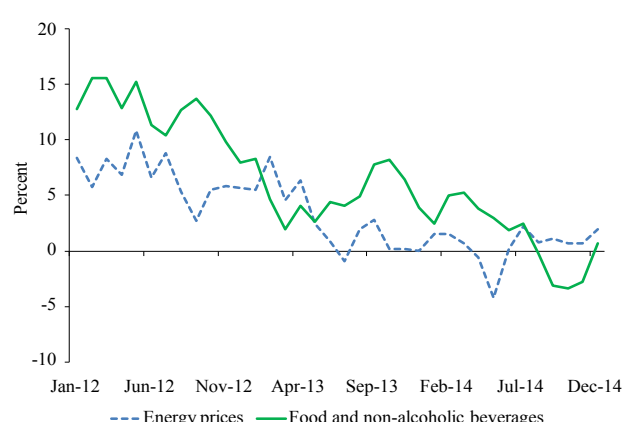
⁵ In its monetary policy statement of August 2014, the BNR explained that the government's effort to expand the crop area in low land (swamps and valleys) contributed to the expanded harvest in season C.

Figure 1.13: Inflation continued to fall, as food prices declined and energy prices remained low

a. Headline and core inflation



b. Energy and food price inflation



Sources: BNR and World Bank staff calculations.

Core inflation (inflation excluding food and fuel) declined to 2.7 percent, down from 4.0 in 2013. Low core inflation reflects low inflation in imported goods, the result of low inflation

in Rwanda's main trading partners; the second-round impact of low energy prices; and effective monetary and exchange rate policies by the BNR.

Box 1.3 What is driving low inflation in Rwanda?

Inflation measures changes in the prices of the consumer basket in an economy over time. The consumer basket represents consumption by an average household in a country. Goods and services included in the basket and their weights are determined from the Household Expenditure Survey (commonly known as the EICV).

Goods and services in the consumer basket and their weights are revised based on information from the latest EICV. Revisions help avoid potential biases that might otherwise develop over time as a result of new goods and services in the basket or shifts in consumption.

The latest revision of the consumer basket of goods and services was made in June 2014. The content and weights were revised based on the EICV-3 and prices rebased at February 2014 prices. These procedures help ensure that the index reflects long-term trends in consumer spending patterns. For instance, the latest revision saw a shift in weights from food and nonalcoholic beverages to imported products (Box table 1.3.1).

Box table 1.3.1: Weights in Rwanda's consumer price index
(percent)

Division	Headline inflation		Local index		Imported index	
	EICV 2005/06	EICV 2011/12	EICV 2005/06	EICV 2011/12	EICV 2005/06	EICV 2011/12
01. Food & non-alcoholic beverages	35.4	28.2	29.8	22.8	5.6	5.4
02. Alcoholic beverages & tobacco	2.4	2.8	2.0	2.5	0.4	0.3
03. Clothing and footwear	3.8	4.2	0.6	0.7	3.1	3.5
04. Housing, water, electricity, gas & other fuels	22.0	23.0	21.3	22.8	0.7	0.2
05. Furnishing, household equipment & routine household maintenance	4.6	4.1	2.6	1.9	2.0	2.2
06. Health	1.6	0.9	1.0	0.6	0.6	0.3
07. Transport	11.9	17.7	7.6	6.7	4.3	11.1
08. Communication	2.9	2.8	2.6	2.6	0.3	0.2
09. Recreation & culture	2.6	2.1	0.9	0.4	0.0	0.0
10. Education	3.3	5.9	3.3	5.9	0.0	0.0
11. Restaurants & hotels	5.6	4.3	5.6	4.3	1.6	1.7
12. Miscellaneous goods & services	4.0	4.1	2.1	3.1	1.9	1.0
Total	100.0	100.0	79.5	74.3	20.5	25.7

Sources: NISR and World Bank staff calculations.

Box 1.3 What is driving low inflation in Rwanda? (continued)

Rwanda's consumer price index (CPI) contains 1,022 items, grouped into 12 main divisions and classified by origin (local or imported). Price information is collected from a variety of places, including shops, markets, hospitals, and schools. More than 25,392 prices in urban areas and 8,329 in rural areas are collected every month. In line with international practices, the CPI is calculated using modified Laspeyres methods, which allow direct comparison of indexes in subsequent years to the base year.

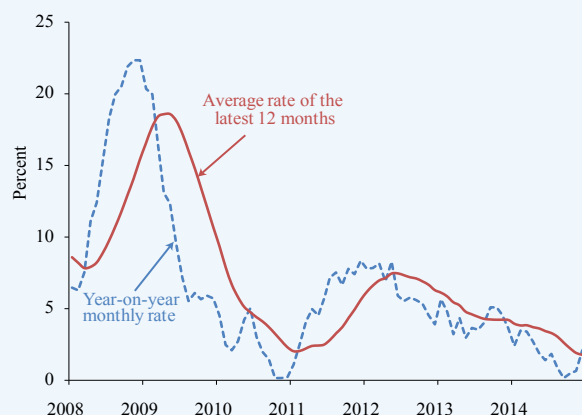
The pace of inflation in Rwanda has been slowing. Headline inflation fell sharply, from more than 22 percent in December 2008 to 0.2 percent in November 2010, before rebounding to nearly 8.5 percent by end-2011. It has been on a downward path since mid-2012. It fell to 1 percent between August and November 2014, hitting a low of 0.2 percent in September (Box Figure 1.3.1).

The 2014 deflationary spiral is not unique to Rwanda: most of its major trading partners are experiencing a slowdown in inflation (Box Figure 1.3.2). Rwanda's headline inflation began to decline after most of its major trading partners, but its inflation rate has fallen substantially since mid-2014, becoming the second lowest after the Euro area. Rwanda seems to have imported low inflation, even though the Rwandan franc was depreciating.

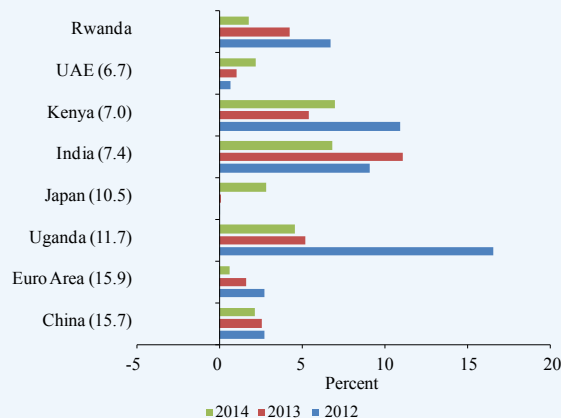
Although most price indexes fell in 2014, the main driver of drop in inflation was food products, particularly vegetables (Box Figure 1.3.3). In October 2013 food inflation was 8.2 percent and accounted for 45.2 percent of headline inflation. A year later, in October 2014, food inflation stood at -3.3 percent and constituted the main driver of the reduction in headline inflation. This downward trend of food prices was led by vegetables, whose average price declined 13.8 percent between October 2013 and October 2014. Vegetables account for 10.1 percent of household expenditure in Rwanda. The substantial contribution of food to overall inflation suggests that inflation is largely supply driven, as shown by inflation peaks in October 2013 caused by poor harvests. With a good harvest of fresh crops, mainly vegetables, in 2014, food prices declined, pushing down overall inflation.

The price of energy, which accounts for almost 8 percent of the CPI basket, also contributed to lower inflation. Energy inflation has declined steadily since mid-2013. It has been less than 2.0 percent since December 2013, contributing less than 0.02 percentage points on average to annual headline inflation. The decline in energy prices is a result of low global demand because of weak economic activity, increased efficiency, and a growing switch away from oil to other fuels, together with the fact that the main producers, especially in the Persian Gulf, have sustained production.

Lower energy prices are reflected in the revision of domestic fuel prices at the pump. These prices were reduced three times in 2014, from Rwf 1,030 (US\$1.54) per liter in December 2013 to Rwf 895 (US\$1.29) in December 2014. Domestic fuel prices are administered by a committee, consisting of public and private sector representatives, that meets monthly to discuss and determine prices, taking into account trends in worldwide oil prices.

Box Figure 1.3.1: Movement in Consumer Price Index, 2008–14

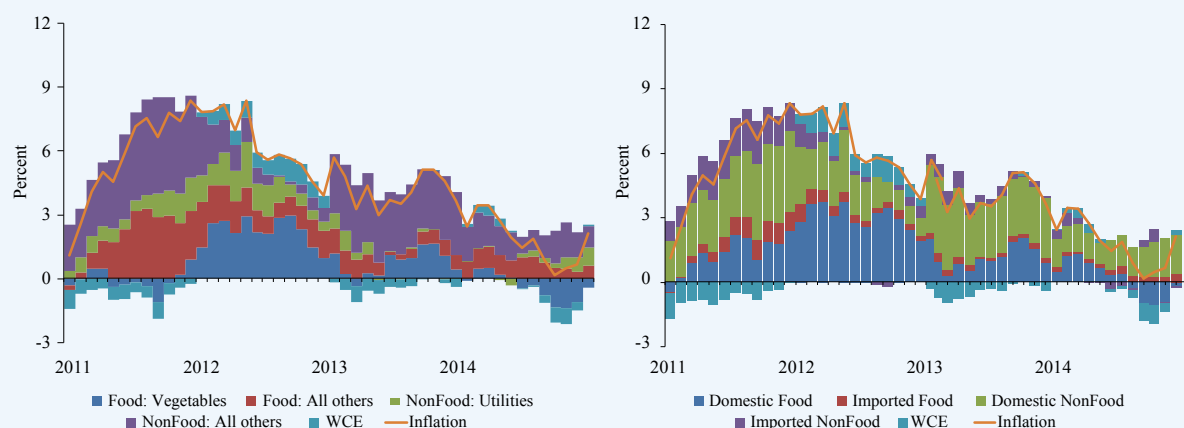
Sources: NISR and World Bank staff calculations.

Box Figure 1.3.2: Inflation in Rwanda and select trade partners

Sources: NISR, OECD, COMTRADE, United Arab Emirates National Bureau of Statistics, and World Bank staff calculations.

Note: Trade partners were selected using imports as of 2013.

Numbers in parentheses indicate percentage share in Rwanda's imports in 2013.

Box 1.3 What is driving low inflation in Rwanda? (continued)**Box Figure 1.3.3: Headline inflation in Rwanda and its major components, 2011–14**

Sources: BNR and World Bank staff calculations.

Note: Utilities includes housing, water, electricity, gas, and other fuels. WCE stands for “Weight Change Effect”.

In addition to its direct effects on the CPI, falling energy prices have indirect effects on inflation. Lower energy prices contributed indirectly to slowing inflation in the services sector, especially in the transportation sector. In November 2014, transportation inflation stood at –1.8 percent. Given that transportation services are important inputs into many other sectors, the second-round effect of the decline in energy prices seem to be relevant for overall developments in headline inflation in Rwanda.

Another important measure of inflation is “core” inflation, which ignores fresh products and energy in Rwanda. This measure is motivated by the fact that food and energy are subject to large fluctuations that inject shocks into CPI inflation signals. Cutting these components eliminates transitory shocks and gives a better indicator of underlying inflation. In most countries, core inflation is used to help guide monetary policy, although inflation objectives are set in terms of the headline CPI. Core inflation in Rwanda oscillated below 3.5 percent in 2014.

b. Exchange Rate

Depreciation of the Rwandan franc against the U.S. dollar decelerated in 2014 (panel a of Figure 1.14). After falling 4.3 percent against the dollar in the second half of 2013, the Rwandan franc lost just 1.9 percent of its value in the first half of 2014. The depreciation eased further in the second half of 2014, when the value of the Rwandan franc fell 1.7 percent. Overall, the Rwandan franc depreciated by 3.6 percent in 2014, 2.5 percentage points less than in 2013, despite the decrease in the BNR’s intervention in foreign exchange markets.⁶

The Rwandan franc appreciated against the euro and most regional currencies. Rwanda’s nominal and real effective exchange rates (see Box 1.4 for detailed analysis), calculated as a trade-weighted average of bilateral exchange rates, appreciated in the second half of 2014, thanks to the nominal appreciation against regional currencies, the moderate depreciation against the U.S. dollar, and Rwanda’s low inflation (panel b of Figure 1.14).

⁶ The BNR intervenes in foreign exchange markets primarily to limit volatility and provide foreign exchange to support imports when foreign exchange flows remain tight. In 2014 its interventions amounted to US\$264 million, down from US\$322 million in 2013.

Box 1.4 What are nominal and real effective exchange rates?

Most people are familiar with the nominal exchange rate—the number of units of domestic currency that can purchase a unit of foreign currency. On January 30, 2015, the price of US\$1 was Rwf 707.23. A decrease in this number is termed nominal appreciation of the domestic currency; an increase is termed nominal depreciation. The bilateral exchange rate provides information on the relative value of the domestic currency with respect to the currency of a single trading partner.

Much research seeks to compare the general trading situations of a number of countries. Indeed, a country may be more interested in how the exchange rate is behaving in relation to all its trading partners than in relation to any single partner. A country's trade-weighted exchange rate, also known as the effective exchange rate, provides this information.

The nominal effective exchange rate (NEER) measures the average change in a country's nominal exchange rate against a number of other currencies during a given period compared with a base year. Unlike the bilateral exchange rate, the NEER is an index, not the relative price of one currency with respect to another. It is a weighted average of the exchange rates of a country with respect to its major trading partners' currencies, with the weights based on the level of trade with each partner. Series for NEER can be used to compare changes in the terms of trade of a number of countries. A country whose NEER is depreciating is trading on worsening terms, as it costs that country more to buy goods and services from abroad.

The real exchange rate (REER) is an important refinement of the NEER. A country's REER is calculated by adjusting its NEER for differences in inflation at home and abroad. It provides a measure of a country's export competitiveness: a rise in the index implies a fall in competitiveness.

Changes in the NEER and REER depend on three factors. The first factor is the nominal exchange rate. Depreciation (appreciation) of the domestic currency relative to trading partners' currencies entails an increase (decrease) in both the NEER and the REER. The second factor is the price level in the country under consideration (the domestic price level) and its trade partners. A higher (lower) inflation rate than in a country's trade partners leads to depreciation (appreciation) of the REER. The third factor is the weights of the major trading partners in the total external trade turnover of the country under consideration. The heavier the weight, the greater the impact of the exchange rate of that country, as well as the impact of price development on indexes of effective exchange rates.

The choice of countries and relative weights is critical to the REER. In principle, all countries that trade with the country whose competitiveness is being determined should be included, whether this relationship is direct or indirect through a third market. In practice, the availability of time series and the time at which the series are published usually means that the number of countries taken into account is smaller.

Rwanda's official exchange rate indexes include a basket of 10 currencies of major trading partners (Box table 1.4.1). These indexes are constructed as a weighted average of exchange rates of the Rwandan franc versus the currencies of trading partners, with the weight for each partner equal to its share in total external trade. The current basket composition is based on external trade of 2008. CPIs are used, because they have the advantage of being timely, similarly constructed across countries, and available for a wide range of countries over a long time.

Box table 1.4.1: Composition of the currency basket in Rwanda's external trade

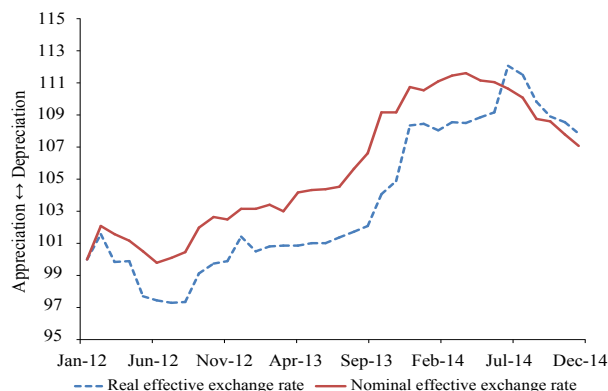
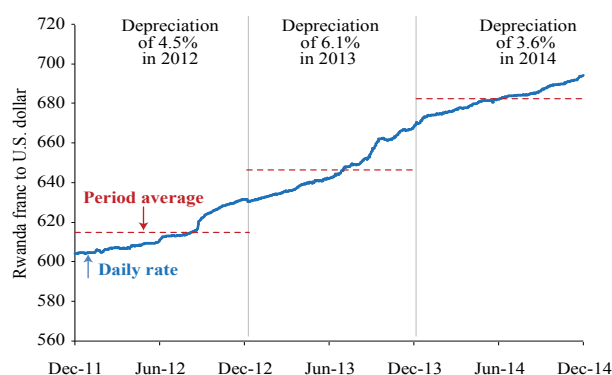
Trading partner	Weight in Rwanda's external trade (percent)
United States	34.5
Euro area	20.4
Uganda	13.7
Kenya	11.7
South Africa	5.0
Tanzania	4.3
United Kingdom	4.2
Sweden	2.9
Switzerland	2.2
Burundi	1.1
Total	100.0

Source: BNR.

Figure 1.14: The depreciation of the Rwandan franc against the U.S. dollar slowed

a. Rwandan franc against U.S. dollar

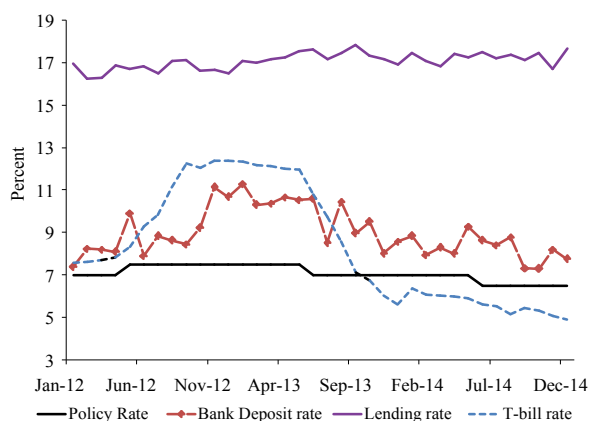
b. Real and nominal effective exchange rates, January 2012–December 2014



Sources: BNR and World Bank staff calculations. Note: Jan 2012 = 100.

c. Monetary Policy and Interest Rates

Lending rates remained unresponsive to changes in the BNR policy rate, revealing ineffective transmission to the financial market (Figure 1.15). Low demand for Treasury bills by commercial banks, reflecting their improved lending to the private sector, led to a decrease in the Treasury-bill rate, from 5.6 percent in June 2014 to 4.9 percent in December 2014. The lending rate did not decline, however, fluctuating around 17.5 percent over this period, and deposit rates fell just 0.8 percentage points. The lack of responsiveness of the lending rate reflects the heavy reliance on cash in Rwanda, limited competition in the banking sector, and an underdeveloped financial market.

Figure 1.15: Lending rates did not respond to the policy rate cut

Sources: BNR and World Bank staff calculations.

The government, in collaboration with the BNR, initiated a quarterly bond issuance program to improve the effectiveness of Rwanda's monetary policy, facilitate capital market development, and finance investment projects. It started the bond issuance program in 2008 but suspended it in 2009 (because of the global financial crisis) and in 2012 (because of the aid shortfall). It therefore had to rely on short-maturity Treasury bills. The government issued bonds three times in 2014: Rwf 12.5 billion in February (three-year maturity), Rwf 15 billion in August (five-year maturity), and Rwf 15 billion in November (seven-year maturity).⁷ Additional issuances are scheduled for February and May 2015.

d. Banking Sector

Credit to the private sector started to grow in 2014, after a prolonged deceleration caused by the 2012 aid shortfall (Figure 1.16). It increased from 11.5 percent in the fourth quarter of 2013 to 15.4 percent in the third quarter of 2014. Economic recovery in the first three quarters of 2014 and subsequent improvement in financial sector soundness resulted in the slow but steady recovery of credit growth to the private sector. The capital adequacy ratio, measured as bank's capital to risk-weighted assets, increased from 23.1 percent in December 2013 to 23.6 percent

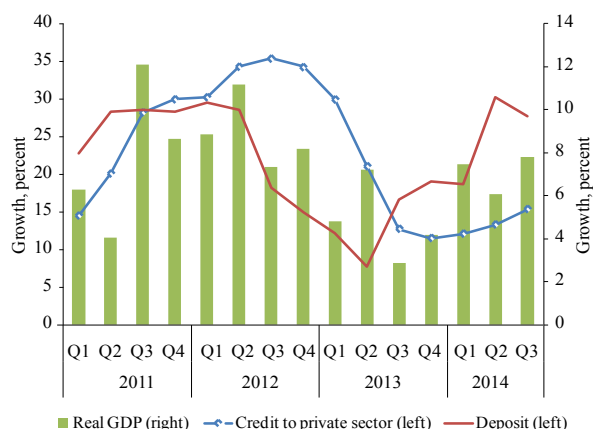
⁷ The third issuance, in November 2014, attracted 59 bids, with a subscription level of 187 percent. The annual coupon rate is 12.475 percent.

in June 2014, significantly higher than the 15 percent minimum requirement. The quality of bank assets improved after slightly deteriorating in 2013 as a result of the economic slowdown. The ratio of nonperforming loans to gross loans declined from 7.0 percent in December 2013 to 6.6 percent in June 2014. Improved lending behavior by commercial banks is reflected in the smaller decline in the Treasury-bill rate in response to the policy rate cut in July 2014 and the volume of new loans, which increased 48 percent in the first three quarters of 2014, from Rwf 324.8 billion to Rwf 482.2 billion.

Credit growth recovered across key sectors (Figure 1.17). In the services sector, credit growth to the commerce, business, and hotels subsectors—the main drivers of growth in services—increased from 14.6 percent in the

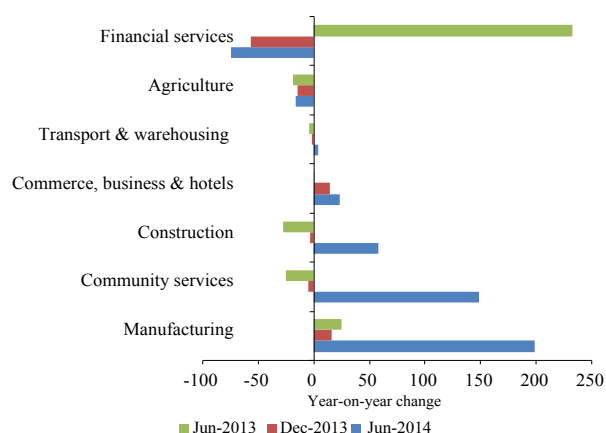
second half of 2013 to 22.9 percent in the first half of 2014. The increase underpinned the acceleration in growth in services in the first three quarters of 2014. Credit growth to subsectors in industry increased in the first half of 2014, with credit to the construction subsector growing 57.8 percent, up from –3.6 percent in the second half of 2013. Credit growth to the construction subsector did not result in high sectoral growth, however, because of continued delays in the government’s construction activities. Credit to the manufacturing subsector increased 198.7 percent, up from 15.8 percent in the second half of 2013. The increase is attributable to a single Rwf 30 billion loan to the Rwanda Cement Factory, however. Excluding this loan, credit to the subsector fell 2.4 percent, reflecting slower growth.

Figure 1.16: Credit to the private sector started to grow in 2014



Sources: BNR and World Bank staff calculations.

Figure 1.17: Credit to the private sector recovered across key sectors



Sources: BNR and World Bank staff calculations.

1.4 Fiscal Developments: Remaining Concerns about Capital Expenditure

Total revenue and grants for the 2013/14 fiscal year were almost as projected, but total expenditure fell short of projections by 3.7 percent (1.2 percentage points of GDP). Tax revenues were 1.3 percent lower than projected, offset by higher than projected grants, despite the government's efforts to reduce reliance on donor funding under the Medium-Term Expenditure Framework (MTEF). Although structural changes in budget support from budgetary grants to budgetary loans affected the composition of grants and financing, the 2014/15 fiscal year budget remains consistent with the MTEF, reducing the overall deficit excluding grants. The provisional outturn in the first quarter of 2014/15 fiscal year, however, reveals that Rwanda continues to suffer from delayed implementation of government investment projects.

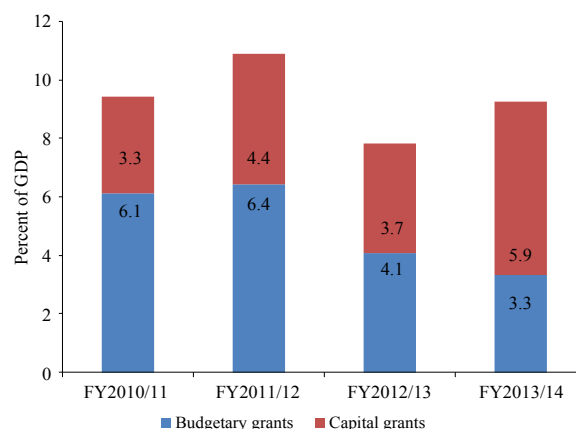
Rwanda's fiscal policy has been consistent with a macroeconomic framework focused on maintaining stability while promoting economic growth.⁸ The composition of public expenditure lays the foundations for achieving the national goals of accelerating growth and reducing poverty identified in the Second Economic Development and Poverty Reduction Strategy (EDPRS 2). The 2012 aid shortfall put Rwanda's fiscal policy under pressure in the 2012/13 fiscal year, leading to spending adjustments. Less than 40 percent of budgetary grants (2 percent of GDP) were realized, pushing the government to resort to increased domestic borrowing, a build-up in arrears, and the postponement of some capital spending in order to sustain priority spending to alleviate the negative impact of the aid shortfall.

a. Budget Outturn for 2013/14 Fiscal Year

Pressure on fiscal policy declined in the 2013/14 fiscal year (Figure 1.18). Total grants increased by 30 percent to reach 9.2 percent of GDP in the 2013/14 fiscal year). The actual figure slightly exceeded the projection (9.1 percent of GDP) (9.2 percent of GDP) (Table 1.2). The higher than projected grants resulted from high capital grants, which were projected at Rwf 262 billion (19.6 percent of the budget) but reached Rwf 303 billion, more than 40 percent more than projected, thanks to the front loading of grants from the Global Fund to Fight AIDS, Tuberculosis and Malaria. In contrast, actual disbursement of budgetary grants was 15 percent

lower than projected because of disbursement delays by the European Union and Germany. The composition of grants shows different patterns before and after the aid shortfall. In the 2010/11 fiscal year, 60 percent of grants were budgetary grants. In contrast, 60 percent of total grants were capital grants in the 2013/14 fiscal year.

Figure 1.18: Total grants recovered in 2013/14 fiscal year, but budgetary grants declined for the second year in a row



Sources: MINECOFIN and World Bank staff calculations.

Domestic revenue collection fell short of the budget by 1.3 percent, as tax revenue fell short of projects by 2.7 percent. Actual tax revenue for the 2013/14 fiscal year was Rwf 761 billion, lower than the target of Rwf 783 billion in the revised budget. Despite a series of tax administration measures that increased tax revenue in the past few years, tax revenue in the 2013/14 fiscal year remained unchanged from the previous fiscal year, as a result of the economic

⁸ MINECOFIN publishes budget execution reports on its website (<http://www.minecofin.gov.rw/index.php?id=2>).

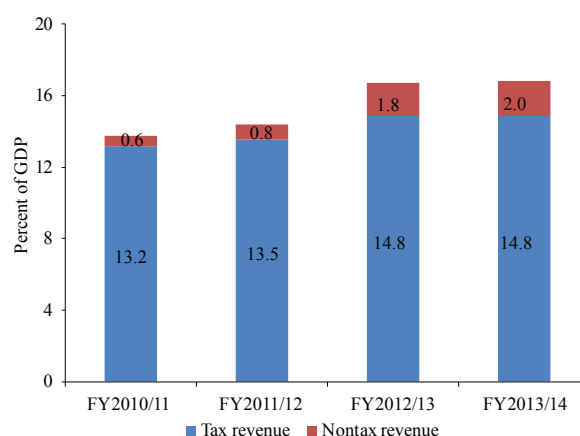
Table 1.2: Fiscal outturn in Rwanda, 2013/14 fiscal year
(percent of GDP)

Item	Original		Revised		Actual	
	Billion Rwf	Percent of GDP	Billion Rwf	Percent of GDP	Billion Rwf	Percent of GDP
Revenue and grants	1,314.1	25.7	1,336.8	26.2	1,336.4	26.0
Total revenue	843.5	16.5	873.8	17.1	862.1	16.8
Tax revenue	775.4	15.2	782.5	15.3	761	14.8
Nontax revenue	68.0	1.3	91.3	1.8	101	2.0
Total grants	470.6	9.2	463.0	9.1	474.3	9.2
Budgetary grants	170.6	3.3	201.2	3.9	171	3.3
Capital grants	300.0	5.9	261.8	5.1	303.3	5.9
Total expenditure and net lending	1,653.4	32.4	1,598.8	31.3	1,538.9	30.0
Current expenditure	850.7	16.7	760.9	14.9	776.7	15.1
Wages and salaries	181.7	3.6	195.2	3.8	187.9	3.7
Purchases of goods and services	319.2	6.3	130.1	2.5	142.5	2.8
Interest payments	40.4	0.8	37.5	0.7	40.4	0.8
Transfers	268.4	5.3	273.7	5.4	286.8	5.6
Exceptional social expenditure	72.4	1.4	124.4	2.4	119.1	2.3
Capital expenditure	802.7	15.7	750.1	14.7	712	13.9
Domestic	314.8	6.2	365.2	7.2	320.2	6.2
Foreign	487.9	9.6	384.9	7.5	391.9	7.6
Net lending	114.8	2.2	87.8	1.7	50.2	1.0
Change in arrears (– : net reduction)	–9.2	–0.2	–9.2	–0.2	–16.1	–0.3
Overall deficit (cash basis)						
Including grants	–348.5	–6.8	–271.2	–5.3	–218.7	–4.3
Excluding grants	–819.1	–16.0	–734.2	–14.4	–693	–13.5
Financing	348.5	6.8	271.2	5.3	218.7	4.3
Foreign financing (net)	197.0	3.9	109.9	2.2	104.7	2.0
Domestic financing	151.5	3.0	161.3	3.2	114	2.2

Sources: MINECOFIN and World Bank staff calculations.

slowdown and delays in implementing further tax administration measures (Figure 1.19).⁹ In contrast, actual nontax revenue exceeded the projected amount by 10.6 percent because of higher receipts from peacekeeping operations.

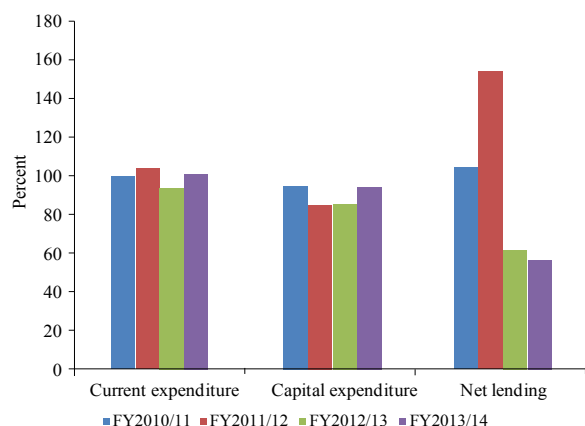
Execution of capital expenditure and net lending remained low, although total expenditure returned to pre-aid shortfall levels (Figure 1.20). In the 2013/14 fiscal year, 95 percent of capital expenditure and 57 percent of net lending were executed. The budget execution report by MINECOFIN attributes the low execution rate to delayed finalization of disbursement documents and

Figure 1.19: Tax revenue remained unchanged, as a result of the economic slowdown

Sources: MINECOFIN and World Bank staff calculations.

⁹ These reforms include the continued roll-out of electronic billing machines, taxpayer education, investment in information technology facilities to improve services to taxpayers, and collection of local government taxes by the Rwanda Revenue Authority.

Figure 1.20: Expenditure execution remained weak
(actual spending as a percent of projected spending)



Sources: MINECOFIN and World Bank staff calculations.

Note: FY indicates fiscal year

delayed implementation of the Energy, Water and Sanitation Authority's hydro project (the Nyabarongo power project). Net lending to the Kigali Convention Center, one of the largest government investment projects, was significantly lower than initial projections because of delays in construction: the government was projected to spend Rwf 96 billion but actually spent only Rwf 50 billion (see Box 1.5 on public investment management). These delays can be attributed to capacity constraints on executing capital expenditure by ministries with large budgets

(see Annex Note 3 in REU-6). Although the government ensured full execution of spending for interest payments and purchases of goods and services, neither spending for wages and salaries nor social expenditure were fully executed, mainly because of delays in recruitment by various ministries, agencies, and districts. Actual total expenditure of Rwf 1,539 billion (30.0 percent of GDP) was 3.7 percent lower than the Rwf 1,599 billion (31.3 percent of GDP) in the revised budget.

As a result of delayed implementation of government operations, total expenditure and net lending were concentrated in the second half of the 2013/14 fiscal year, contributing to higher government consumption and investment in the first half of 2014. Recurrent expenditure increased 1.6 percentage points of GDP to 15.9 percent in the second half of the 2013/14 fiscal year, up from 14.3 percent in the first half. Capital expenditure increased 2.7 percentage points of GDP to 15.2 percent in the second half of the 2013/14 fiscal year, up from 12.5 percent in the first half. Net lending increased 1.5 percentage points of GDP to 1.7 percent, up from 0.2 percent in the first half of the fiscal year. The

Box 1.5 Enhancing public investment management is key for achieving national goals

Public investment management is very important in Rwanda, because public investment (that is, the development budget) dominates total investment, accounting for two-thirds of total investment in 2013. Development expenditure accounts for about half of the total budget. Enhancing public investment management is expected to contribute to achieving national goals through better alignment with national objectives. As public investment has medium- and long-term fiscal implications through future operation and maintenance costs, public investment management is also essential for fiscal sustainability.

The National Public Investment Policy of 2009 defined Rwanda's policy on public investment management, but implementation and application of the policy was weak until recently. For example, the Public Investment Committee, which has decision-making authority over the program, was not operationalized until the formulation of the 2014/15 fiscal year budget. Public investment projects were discussed without feasibility studies. Future budget implications were not taken into consideration in formulating the MTEF. Although leveraging the private sector is a key principle of the Second Economic Development and Poverty Reduction Strategy, the National Public Investment Policy does not cover private-public partnerships.

To address these issues, the government made some reforms in preparing the 2014/15 fiscal year budget—operationalizing the Public Investment Committee, for example (details are in the first and second planning budgeting call circulars for FY 2014/15 [October 2013 and February 2014]). New investment project proposals now need to be accompanied by project profile documents, three-year investment plans, and feasibility studies. The government also plans to revise the National Investment Policy to cover both public investment and private-public partnerships.

backloaded government spending in the second half of the 2013/14 fiscal year was reflected in increased domestic demand and higher economic growth in the first half of 2014.

The overall fiscal deficit in the 2013/14 fiscal year was much lower than expected. Despite budgetary grants that were 15 percent lower than projected, the overall fiscal deficit was only Rwf 219 billion (–4.3 percent of GDP), much lower than the projected Rwf 271 billion (–5.3 percent of GDP). The lower deficit was caused primarily by delayed disbursement of capital expenditure and low net lending to government investment projects. The deficit was financed equally by external and domestic borrowing.

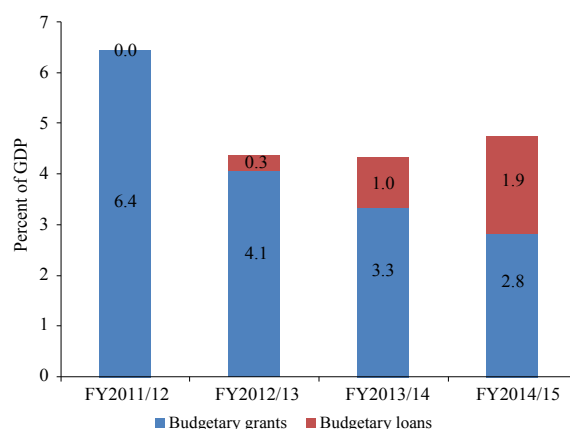
b. Budget for 2014/15 Fiscal Year

In the 2014/15 fiscal year budget, the government committed to increase tax revenues. Tax revenue is projected to increase by 1.1 percentage points of GDP, from 14.8 percent in the 2013/14 fiscal year outturn to 15.9 percent in the 2014/15 fiscal year budget (Table 1.3). In contrast, nontax revenue is expected to decline, as a result of higher than projected reimbursements from the United Nations for peacekeeping operations in the 2013/14 fiscal year. Both tax and nontax revenue are consistent with the targets set by the MTEF for progressively increasing domestic revenue collection and reducing aid dependency. Budget amounts for tax and nontax revenue are higher than projected in 2013 for the MTEF.

As a result of structural changes in budget support disbursement by development partners from budgetary grants to budgetary loans, budgetary grants are expected to decline 0.5 percentage points, from 3.3 percent of GDP (Rwf 171 billion) in the 2013/14 fiscal year (actual) to 2.8 percent of GDP (Rwf 159 billion) in the 2014/15 fiscal year (Figure 1.21). Total grants are projected to decline from 9.2 percent

of GDP (Rwf 474 billion) in the 2013/14 fiscal year (actual) to 7.1 percent (Rwf 397 billion) in the 2014/15 fiscal year. The structural changes are reflected in an increase in the overall deficit including grants from 4.3 percent of GDP (Rwf 219 billion) to 5.2 percent (Rwf 296 billion). The increased deficit is financed by budgetary loans, which increased from 1.0 percent of GDP (Rwf 50 billion) to 1.9 percent (Rwf 107 billion). The overall deficit excluding grants falls by 1.3 percentage points of GDP from the 2013/14 fiscal year budget and 0.3 percentage points from the 2014/15 fiscal year budget projected by the 2013 MTEF, as a result of improved domestic resource mobilization and expenditure prioritization.

Figure 1.21: Support from development partners shifted from budgetary grants to budgetary loans



Sources: MINECOFIN and World Bank staff calculations.

The provisional outturn for the first quarter of the 2014/15 fiscal year reveals that revenues and grants registered a net shortfall. Tax revenue registered a minor shortfall, nontax revenue fell short of the budgeted amount by 1.0 percentage points of GDP, and budgetary grants were 1.6 percentage points of GDP short of the budget. The shortfalls are attributable to delayed reimbursement from UN peacekeeping operations, overestimation of commitments from the European Union and the U.K. Department for International Development, and delays in disbursement by some bilateral donors.¹⁰ On the expenditure side, all current expenditure

¹⁰ The government claims difficulties in obtaining accurate disbursement amounts of capital grants from donors, leaving disbursed capital grants amount equal to the projected amount.

items exceeded budgeted amounts, capital expenditure fell short of the budgeted amount by 1.7 percentage points of GDP, and net lending was 1.6 percentage points of GDP short of the budget. These shortfalls reduced the overall

deficit by 1.0 percentage point of GDP. Lower spending is attributable to continued delays in implementing government investment projects (energy and roads projects and the Kigali Convention Center project).

Table 1.3: Rwanda's budget, 2014/15 fiscal year
(percent of GDP)

	FY2014/15				Jul-Sep 2014			
	Original		Revised		Projected		Provisional	
	Billion Rwf	Percent of GDP	Billion Rwf	Percent of GDP	Billion Rwf	Percent of GDP	Billion Rwf	Percent of GDP
Revenue and grants	1,530.4	26.6	1,394.7	24.8	338.1	24.3	299.7	21.5
Total revenue	985.5	17.2	997.4	17.7	230.2	16.5	213.4	15.3
Tax revenue	906.8	15.8	894.6	15.9	207.8	14.9	205.0	14.7
Direct taxes	379.2	6.6	364.0	6.5	79.9	5.7	81.9	5.9
Taxes on goods and services	461.5	8.0	461.5	8.2	113.0	8.1	108.8	7.8
Taxes on international trade	66.1	1.2	69.1	1.2	14.9	1.1	14.3	1.0
Nontax revenue	78.8	1.4	102.9	1.8	22.4	1.6	8.4	0.6
of which peacekeeping operations	53.4	0.9	62.3	1.1	15.9	1.1	0.6	0.0
Total grants	544.8	9.5	397.3	7.1	107.9	7.7	86.3	6.2
Budgetary grants	328.4	5.7	159.0	2.8	56.8	4.1	35.2	2.5
Capital grants	216.4	3.8	238.3	4.2	51.1	3.7	51.1	3.7
Total expenditure and net lending	1,698.2	29.5	1,680.4	29.9	396.4	28.5	387.4	27.8
Current expenditure	797.4	13.9	794.3	14.1	185.9	13.3	224.3	16.1
Wages and salaries	204.1	3.5	206.6	3.7	51.8	3.7	52.4	3.8
Purchases of goods and services	168.1	2.9	162.1	2.9	39.6	2.8	45.7	3.3
Interest payments	41.4	0.7	42.9	0.8	5.7	0.4	6.6	0.5
Transfers	300.4	5.2	290.4	5.2	65.4	4.7	77.4	5.6
Exceptional social expenditure	83.4	1.5	92.3	1.6	23.4	1.7	42.1	3.0
Capital expenditure	791.2	13.8	767.2	13.6	170.8	12.3	147.0	10.6
Domestic	452.0	7.9	423.3	7.5	97	7.0	73.2	5.3
Foreign	339.2	5.9	343.9	6.1	73.8	5.3	73.8	5.3
Net lending	109.7	1.9	118.9	2.1	39.7	2.8	16.2	1.2
Change in arrears (– : net reduction)	–9.9	–0.2	–10	–0.2	–2.5	–0.2	40.0	2.9
Overall deficit (cash basis)								
Including grants	–177.7	–3.1	–295.6	–5.2	–60.8	–4.4	–47.1	–3.4
Excluding grants	–722.5	–12.6	–692.9	–12.3	–168.7	–12.1	133.4	9.6
Financing	177.7	3.1	295.6	5.3	60.8	4.4	47.1	3.4
Foreign financing (net)	107.6	1.9	197.5	3.5	20.6	1.5	20.6	1.5
Domestic financing	70.1	1.2	101.2	1.8	40.2	2.9	26.5	1.9

Sources: MINECOFIN and World Bank staff calculations.

1.5 Impact of Recent Oil Price Decline on Growth and Poverty: Conflicting Impact on Growth and Poverty

Crude oil prices measured by Brent declined 53 percent from the peak of US\$108 per barrel in June 2014 to US\$52 per barrel in early January 2015. Unlike after the global financial crisis of 2009, cheap oil is likely to have a net positive impact on the economy, by supporting macroeconomic stability and increased policy flexibility. Direct impacts on the poor will be limited, however, because their expenses on energy represent a small share of their consumption basket.

In the wake of the global financial crisis, oil prices declined 68 percent, from US\$134 per barrel in July 2008 to US\$42 per barrel in December 2009. Rwanda was hurt by the slowdown in economic activities of its trading partners in 2009: GDP growth decelerated from 13.4 percent (year-on-year) in the second quarter of 2008 to 3.5 percent in the third quarter of 2009 (IMF 2009).¹¹ Most components decelerated, with the decline in exports contributing most to the slowdown (Figure 1.22).¹²

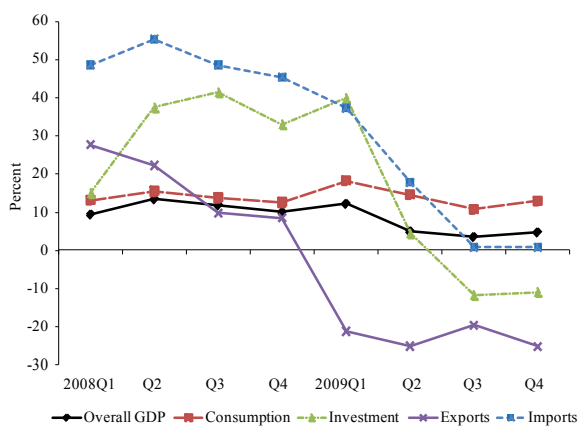
a. Macroeconomic Impact

The current decline in oil prices is expected to have a net positive impact on global growth and Rwanda's economy. Unlike in 2009, the current decline in oil prices is caused mainly by supply factors (for example, shift in OPEC policy and availability of technologies of extracting oil from tight rock formations and tar sands profitable) rather than demand factors.¹³ It is

unlikely to lead to a decline in economic activities of Rwanda's trading partners. Because Rwanda is a net importer of oil, the decline in the cost of oil imports will improve the balance of payments, reduce inflation, and take pressure off the exchange rate. The budget is likely to benefit from smaller electricity subsidies to the Rwanda Energy Group. These impacts should promote macroeconomic stability and increase fiscal and monetary policy flexibility. If, however, commodity prices of Rwanda's main export items (coffee, tea, and minerals) also decline, the positive impacts will be offset by declines in exports.

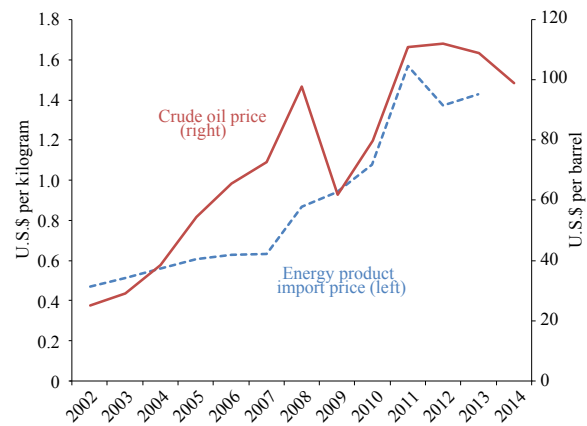
Rwanda imported US\$385 million of energy products in 2013 (269,000 tons at a unit import price of US\$1.40 per kilogram). Crude oil price and Rwanda's energy product import prices are highly correlated (Figure 1.23). Energy product import prices are therefore assumed to decline with crude oil prices.

Figure 1.22: GDP growth slowed in 2008–09, as exports fell



Sources: NISR and World Bank staff calculations.

Figure 1.23: Crude oil prices and Rwanda's energy import prices are highly correlated



Source: BNR and World Bank staff calculations.

¹¹ <http://www.imf.org/external/pubs/ft/scr/2009/cr09264.pdf>.

¹² Energy imports declined 30 percent in 2009, which had a positive impact on the national account.

¹³ According to Global Economic Perspectives (World Bank 2015, 157), "Although it is difficult to pin down the relative importance of these factors, supply-related factors appear to have played a dominant role."

Table 1.4: Impact of oil price decline on Rwanda's 2015 imports of energy

Item	2013 (actual)	Scenario 1: Oil costs US\$62 per barrel (2015 GEP projection)		Scenario 2: Oil costs US\$52 per barrel (latest price)	
		2015 estimate	Gap	2015 estimate	Gap
Value (U.S. dollars)	385	278	-107	211	-173
Volume (thousand tons)	270	310	41	310	41
Unit price (U.S. dollars per kilogram)	1.4	0.9	-0.5	0.7	-0.7
Oil price (U.S. dollars per barrel)	109	62	-46	52	-57
Percent of GDP	5.1	3.3	-1.3 ^a	2.5	-2.0 ^a

Sources: BNR and World Bank staff calculations.

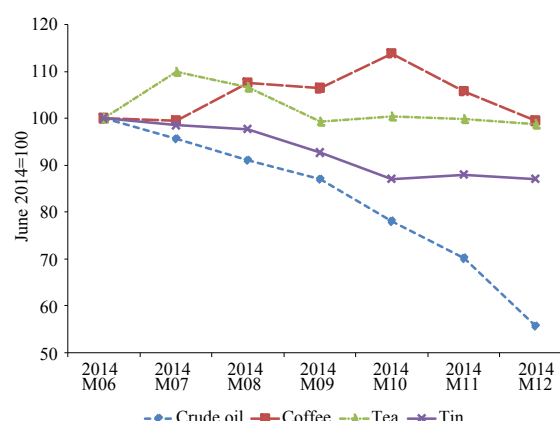
^a Calculated as a share of the gap in value to 2015 projected GDP.

This subsection examines two price scenarios.

In the first, oil prices decline 32 percent, as projected by the 2015 *Global Economic Prospects* (World Bank 2015).¹⁴ In the second, oil prices remains at their current level of US\$52 per barrel. In both scenarios, the import volume of energy increases at the same rates of estimated GDP in 2014 (7.0 percent) and 2015 (7.5 percent) and unit import price declines at the same rate as crude oil price. With these price assumptions, imports of energy products decline US\$107 million (1.3 percent of GDP) in the first scenario and US\$173 million (2.0 percent of GDP) in the second scenario (Table 1.4). Given Rwanda's current account balance in 2013 (-7.1 percent of GDP), potential savings seem significant and should contribute to macroeconomic stability.

The potential negative impact on exports would be smaller than the positive impact of lower energy product imports. International coffee and tea prices have been relatively stable. In contrast, tin prices fell more than 10 percent between June and December 2014 (Figure 1.24). A simple calculation based on 2013 balance of payments data shows that if the prices of coffee, tea, and minerals decline 10 percent, exports of these items will decline by US\$34 million (of which minerals are US\$23 million). If prices of these commodities decline at the same rate as oil (52 percent), the impacts on exports would be about US\$170 million, almost the same as savings from energy product imports.

Figure 1.24: Unlike the price of oil, the prices of Rwanda's main export commodities remained stable



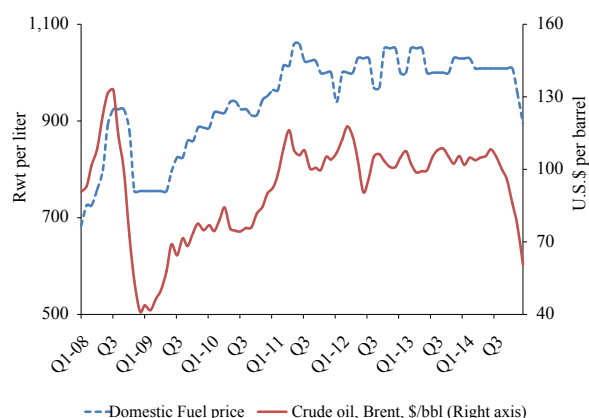
Sources: World Bank (DEC) and World Bank staff calculations.

Domestic energy prices would reduce the overall CPI by about 4 percent if domestic energy prices declined at the same rate as crude oil prices and crude oil price remained the same throughout 2015. Energy accounts for 7.75 percent of Rwanda's CPI basket. Domestic fuel prices are regulated and set on a monthly basis by representatives from the government and the private sector. The impact will thus depend on regulated domestic prices. Crude and domestic oil prices are highly correlated, though domestic fuel prices fell less than international prices (Figure 1.25). If transportation costs (such as bus fare) decline, the impact would be larger. The decline in oil prices would relieve pressure on the exchange rate by lowering demand for foreign exchange. Reducing inflationary and exchange

¹⁴ http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2015a/pdfs/GEP15a_web_full.pdf

rate pressures and increasing macroeconomic stability would enable the central bank to adopt monetary policy that stimulates growth.

Figure 1.25: Domestic fuel prices and crude oil prices are correlated



Sources: MINICOM and World Bank staff calculations.

Electricity subsidies would likely decline, leaving a net positive impact on the budget.¹⁵

According to the Budget Framework Paper for the 2014/15 fiscal year, the government plans to allocate Rwf 16 billion (US\$24 million) to electricity and water through the Ministry of Infrastructure. On the revenue side, the fuel tax rate depends on volume rather than value or price.¹⁶ There would thus be little impact on revenues.

The decline in oil prices should positively affect industry, especially manufacturing, which relies heavily on generators for production. The decline in fuel prices will reduce input costs.

b. Impact of the Oil Price Decline on the Poor

According to the latest household survey (2010/11), 62 percent of households in Rwanda purchase oil products.¹⁷ Of these households, 59 percent purchase kerosene; less than 2 percent purchase diesel or gasoline. Spending on oil products is low: households that use oil products spent an average of Rwf 1,757 a year on oil. For the population as a whole (including households that do not use oil products), average annual spending was Rwf 1,083.

The purchase of oil products increases in each consumption decile up to the seventh decile, after which it decreases (Table 1.5). This decline can be explained by the lower use of kerosene by wealthier households. The average amount spent on oil products is low for all consumption deciles except the top decile, which spends an average of Rwf 35,400 on oil products.

Table 1.5: Annual purchases of oil products and amounts spent in Rwanda, by consumption decile, 2011 (2010/11 Rwf)

Consumption decile	Percent of households that purchases oil products	Amount spent (Rwf)
1	45.3	199
2	56.1	242
3	63.1	265
4	62.0	299
5	67.6	339
6	68.4	370
7	70.4	426
8	67.7	529
9	64.3	812
10	51.5	35,428

Sources: NISR and World Bank staff calculations.

¹⁵ Limited data make it difficult to estimate the impact of the decline in oil prices. The Budget Framework Paper for 2014/15 assumes that oil prices decline 6.1 percent in 2014 and 2.4 percent in 2015.

¹⁶ Fuel taxes are fixed. In the 2014/15 fiscal year, the tax was set at Rwf 183/liter of gasoline and Rwf 150/liter of diesel.

¹⁷ Data on households' purchases of oil products from the EICV3 appear suspect. The team will discuss these data with NISR and update the results if necessary.

If households do not change oil consumption behavior, a drop in oil prices can be considered an in-kind subsidy to oil purchasers.¹⁸

Imputing this in-kind subsidy to oil users, a 52 percent drop in oil prices would save the average household in Rwanda Rwf 563 a year. Savings would be negligible except for the top decile, however (Table 1.6).

Table 1.6: Average annual savings per household in Rwanda associated with a 53 percent drop in oil prices, by consumption decile, 2011 (2010/11 Rwf)

Consumption decile	Amount saved (Rwf)
1	19
2	38
3	46
4	57
5	67
6	77
7	92
8	112
9	168
10	5,887

Sources: NISR and World Bank staff calculations.

1.6 Economic Outlook and Risks: Continuing Growth Momentum

The World Bank increases its growth rate projection for 2014 to 7.0 percent, up from 5.7 percent in the August 2013 edition of the Rwanda Economic Update. The earlier projections were based on the assumption that agricultural harvests would be unfavorable, as a result of adverse weather condition in season B; international commodity prices of minerals would be lower; and import volume of intermediate materials would contract, as a result of delayed implementation of government investment projects. In fact, the economy recovered during the first three quarters of 2014, thanks to strong growth in the services sector supported by increased government spending and high agriculture production in seasons A and C. Coincident and leading indicators, such as credit growth to the private sector and imports of capital goods, show that growth momentum remained robust in the fourth quarter of 2014 and will continue to be so in the future, leading to the upward revision of the projected growth rate.

Economic growth is projected to reach 7.5 percent in 2015 and 7.7 percent 2016—close to the country’s potential—thanks to a continued stable macroeconomic framework and

ongoing implementation of priority policies.¹⁹

The BNR’s accommodative but vigilant monetary policy stance supports growth momentum and maintains price and exchange rate stability. Ongoing implementation of priority policy areas—agricultural productivity, export capacity, domestic resource mobilization, and expenditure prioritization—will also support growth. The current decline in oil prices is expected to have a net positive impact on Rwanda’s economy through further macroeconomic stability and increased fiscal and monetary policy flexibility.

Projected growth rates assume that the services sectors will continue to be the main driver of growth, powered by strong consumption. The sector is projected to contribute more than half of Rwanda’s growth, supported by strong domestic demand, especially government consumption. Government expenditure is expected to stimulate private consumption. The industrial sector is expected to pick up in 2015 and 2016, but tressed by acceleration of public infrastructure investments in construction. Implementation of public infrastructure projects was delayed in the 2013/14 fiscal year. In the 2014/15 fiscal year budget, the government reiterated its commitment

¹⁸ The quantity of oil products purchased is assumed to remain the same, and households that do not purchase oil products are assumed to remain nonpurchasers.

¹⁹ REU-5 analyzes Rwanda’s potential growth.

to infrastructure investments to sustain rapid growth and facilitate Rwanda's economic transformation.²⁰ These projects are likely to boost not only the construction subsector but also the manufacture of construction materials (cement, furniture). Credit acceleration is expected to support activities in the services and industrial sectors.

Conditional on favorable weather, the agriculture sector is likely to continue to grow at the rate of about 5 percent a year in the near term. Agricultural performance is expected to be supported by the ongoing PSTA 3, which aims to intensify agriculture and animal resource production through land consolidation, mono-cropping, and a larger livestock subsector. The 2014/15 fiscal year budget allocates sizable resources to projects and programs that support implementation of PSTA 3. Despite low commodity prices, export crops are also expected to rebound, as Rwanda continues to focus on increasing production capacity.

Rwanda's external account remains vulnerable to low international commodity prices and high import demand. As reported by in Global Economic Prospects in January 2015, commodity prices are likely to remain low in 2015–17. Excess supply and concerns about global growth prospects have reduced commodity prices. Prices of minerals, Rwanda's main export, are likely to remain sluggish as growth in China, the world's most important buyer of minerals, is expected to slow in 2015. The expected slowdown is likely to depress demand for minerals, especially copper, iron ore (including coltan and wolfram), steel, and nickel. Prices of these metals were recently 33 percent lower than their record highs of 2011. Further price declines would put pressure on Rwanda's current account. On the positive side, lower international commodity prices, especially oil prices, will continue to ease Rwanda's import bill, yielding a smaller current account deficit in 2015 and 2016 than in 2012.

Table 1.7: Actual growth in Rwanda in 2012–14 and projected growth in 2014–16

Item	Actual growth			Projected growth				
	2012	2013	2014 Q1–Q3	2014		2015		2016
				REU-6	REU-7	REU-6	REU-7	
GDP	8.8	4.7	7.1	5.7	7.0	6.6	7.5	7.7
Agriculture	6.5	3.2	5.3	3.4	5.5	4.2	5.4	5.4
Food crops	7.3	3.5	6.0	3.5	6.2	3.5	5.4	5.6
Export crops	10.3	–5.8	0.0	0.1	3.3	12.0	9.8	7.1
Industry	8.5	9.2	6.0	7.5	6.3	9.0	10.3	10.5
Mining and quarrying	–8.1	20.6	15.0	3.7	13.7	5.0	15.6	15.7
Manufacturing	5.4	4.6	2.4	6.3	2.7	6.0	7.7	8.6
Construction	13.9	11.5	6.4	8.6	6.8	11.3	10.1	9.9
Services	11.5	5.4	9.1	6.7	8.6	7.9	8.6	8.9
Public expenditure–led services	14.0	6.3	9.6	8.4	10.5	7.8	12.0	12.2
Other services	11.1	5.2	9.0	6.4	8.2	7.9	7.9	8.2

Sources: NISR (actual growth) and World Bank staff calculations (projected growth).

²⁰ Budgeted expenses on key projects in the 2014/15 fiscal year budget include construction of a national wide transmission line (Rwf 27 billion), the roll-out of electricity programs (Rwf 34.3 billion), the construction and rehabilitation of power plants and stations (Rwf 60.3 billion), and the construction and rehabilitation of roads (Rwf 46.9 billion). The budget speech for 2014/15 fiscal year was titled toward infrastructure development to accelerate export growth (Republic of Rwanda June 2014) Budget Speech Financial Year 2014/15)

Inflation is likely to remain moderate in the near term, after edging up toward the end of 2014. Recent rises in inflation reflect a slight pick-up in food prices. Inflation pressures tend to build up toward the end of the year, as a result of increased spending during the holiday season. Despite this slight rise, inflation is likely to remain modest in the near term, as the food supply is expected to increase during season A of 2015 and imported inflation is expected to remain subdued as international commodity prices, especially oil prices, remain low.

A number of factors could pose risks to Rwanda's outlook. Rwanda's near-term outlook depends on implementation of the government budget, as the public sector plays a key role in both investment and consumption. Households and firms alike would benefit from increased public activity, which is likely to stimulate domestic

production. Delays in government investment projects would hold back growth in 2015 and 2016. A second risk is regional instability. Tourism receipts, which depend critically on regional security, are Rwanda's largest source of foreign exchange. A third risk is the continued decline in commodity prices of Rwanda's main export items (coffee, tea, and minerals), which could increase the current account deficit. A fourth risk is the rain-fed nature of Rwanda's agriculture. Abnormal rain and floods severely affect not only the agricultural sector but also the food manufacturing and trade sectors. Bad weather and untimely rains constitute a major risk to growth in 2015 and 2016. The special focus section of this report discusses market and production risks in the agriculture sector in detail and provides measures to make Rwanda's agriculture more resilient to them.



PART TWO

Special Focus: Agricultural Sector Risk Assessment



2.1 Performance of the Agricultural Sector

The previous section revealed that Growth projections depend heavily on the performance of the agriculture sector. As a result of sufficient rainfall, strong agricultural performance in 2014 contributed to national economic performance that surpassed growth projections. The input-output table in Box 1.1 confirms that, given the small share of inputs, changes in agriculture outputs have more direct impacts on the national account. Thus, reducing risks in the agriculture sector would directly contribute to macroeconomic management. In contrast to neighboring countries, there are few systemic risks to agricultural production in Rwanda. However, local and commodity specific risks remain, causing important losses to the sector. As Rwanda pursues strategies to increase commercialization and private investment in agribusiness, stakeholders will need to manage risks to reach the full potential for growth and development. This special focus section assesses risks to the agricultural sector, prioritizes them according to their frequency and impacts on the sector, and identifies areas of risk management solutions that need deeper specialized attention.

Effective agricultural risk management is likely to have a similar impact as productivity-improving policies to increase baseline yields on growth and poverty reduction. The prevalence of “shock-recovery-shock” cycles vastly limits the government’s ability to concentrate on long-term development issues, threatening achievement of the growth and poverty reduction targets set under EDPRS 2. Stepping up measures to make agriculture more climate resilient, for example, will be critical to attaining the EDPRS 2 goals.

Increasing agricultural productivity is key to raising income and reducing poverty in Rwanda, where about 80 percent of the population lives in rural areas and, to some extent, works in agriculture.²¹ The government has long recognized the importance of agriculture for development. In 2004 it formulated the National Agricultural Policy (NAP), which seeks to contribute to national economic growth, improve food security and the nutritional status of the population, and increase rural incomes.²²

The Ministry of Agriculture and Animal Resources (MINAGRI) developed the Strategic Plan for the Transformation of Agriculture in Rwanda (PSTA) Phase 1 (2004–07), Phase 2 (2008–12), and Phase 3 (2013–18) to implement NAP. PSTA 1 was elaborated in 2004. Its main objective was to contribute to the goals of NAP by transforming agriculture into a modern, professionally operated, and market-oriented economic undertaking through the promotion of professionalism, specialization, technological innovation, and public-private partnerships. PSTA 2 complemented and supported the Comprehensive Africa Agriculture Development Program (CAADP) agenda.²³ Rwanda was the first country to sign a CAADP compact and prepare a sector investment strategy that was fully aligned with CAADP goals. One of the key objectives of the CAADP compact and the investment plan was to progressively reach the 10 percent commitment of national budget allocated to agriculture in order to raise annual growth in the sector to 6 percent by 2015. Four programs were developed to achieve the goals and objectives of PSTA 2/CAADP 1:

²¹ For detailed arguments on poverty and agriculture, see World Bank (2013).

²² NAP’s five areas of focus are (a) ensuring food and nutrition security through the creation of an environment favorable to income generation and the implementation of nutrition interventions; (b) creating a modern, professional, innovative, and specialized agriculture sector that becomes a profitable, all-year-round income-generating activity; (c) creating market-oriented and socially responsible agriculture, targeting domestic, subregional, regional, and international markets; (d) fairly distributing the benefits from all products resulting from different stages of production and processing; and (e) making agriculture integrated, diversified, and environment friendly.

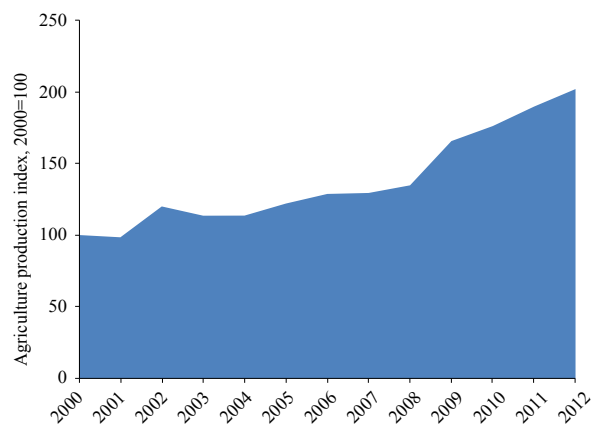
²³ CAADP aims to help African countries grow faster through agriculture-led development. Its vision is to address policy and capacity issues across agricultural sectors in Africa. CAADP is entirely African led and African owned and represents African leaders’ collective vision for agriculture.

(a) identification of a series of actions to intensify and develop sustainable production systems in agriculture and animal husbandry, (b) building of technical and organizational capacity of farmers, (c) promotion of commodity chains and support for the development of agribusiness, and (d) strengthening of the institutional framework of the sector at the central and district levels.

Implementation of these policy initiatives generated tangible results (Tables 2.1–2.3). Agriculture production almost doubled between 2000 and 2012, with most of the increase occurring after 2007 (Figure 2.1). Agricultural GDP grew 5.4 percent a year between 2008 and 2013. Performance of the food crop subsector was particularly impressive, with the value of food crops rising 6.0 percent a year. The productivity of selected priority crops also increased: between 2008 and 2011, yields increased 225 percent for maize, 129 percent for wheat, 90 percent

for cassava, 66 percent for potatoes, 62 percent for bananas, and 34 percent for rice. Increased agricultural production accounted for 35 percent of the reduction in poverty, and commercialization of agricultural production accounted for another 10 percent.

Figure 2.1: Agricultural production almost doubled between 2000 and 2012



Sources: FAOSTAT and World Bank staff calculations.

Table 2.1: Agriculture sector macroeconomic performance indicators for PSTA 2/CAADP 1, 2012
(percent)

Objective	Target	Actual
Increase annual growth of real GDP for all crops and livestock products	6.5	5.6
Increase investment as percent of GDP	23	22.5
Increase off-farm employment as percent of total employment	30	26.6
Reduce percent of rural population living in poverty	52	49
Reduce percent of population falling below minimum food requirements	18	21
Reduce percent of members of female-headed household living in poverty	48	47
Increase annual rate of growth of agricultural exports	8	22

Source: MINAGRI 2012

Table 2.2: Land intensification, inputs, and irrigated land achievements under PSTA 2/CAADP 1, 2012

Objective	Baseline	Target (2012)	Actual (2012)
Increase agriculture area protected against soil erosion (percent)	40	100	73
Increase land protected by trenches and progressive terraces (hectares)	504,000	860,000	802,292
Construct new terraces (hectares)	0	32,000	46,246
Increase area of developed marshland (hectares)	0	20,000	23,000
Increase irrigated area on hillsides (hectares)	0	13,000	2,490
Increase land area under consolidated use (hectares)	28,788 (2007)	—	502,916
Increase application of inorganic mineral fertilizer (percent)	12	25	30
Increase tonnage of fertilizer imported (metric tons)	22,900	56,000	44,000

Source: MINAGRI 2012.

Table 2.3: Livestock, food, and export crop achievements under PSTA 2/CAADP 1, 2012

Objective	Baseline (2008)	Target (2012)	Actual (2012)
Increase basic food crop production over the EDPRS period (percent)	0	15	24
Increase proportion of rural households with livestock (percent)	71 (2005/06)	85	68
Increase number of households reached under the One-Cow Program ^a	0	270,000	174,900
Increase proportion of fully washed coffee production (percent)	10	37	29
Increase coffee exports (MT)	18,200	40,000	19,907
Increase green leaf tea exports (MT)	19,000	123,000	23,011
Increase pyrethrum exports (MT)	2.2	20.8	28.1
Horticultural exports increased (MT)	13,700	25,600	27,822

Source: MINAGRI 2012.

^a Rwanda's One-Cow Program (2006–15) provides poor households with a dairy cow, supplying a stable source of milk for children and a source of soil nutrients via manure for small-scale crop production.

2.2 Lessons Learned and Remaining Challenges

The government has begun implementing PSTA 3 for 2013–18 and is preparing a second CAADP Compact and Investment Plan based on PSTA 3. The objectives of PSTA 3 are to transform Rwandan agriculture from a subsistence sector to a knowledge-based sector and accelerate agricultural growth to increase rural incomes and reduce poverty. The strategy encompasses four broad program areas: (a) agriculture and animal resource intensification; (b) research, technology transfer, and professionalization of farmers; (c) value chain development and private sector investment; and (d) institutional development and agricultural cross-cutting issues.

Under PSTA 3, the target for annual agricultural growth over the next five years is 8.5 percent—a 60 percent increase over the past 10 years. The government's underlying assumption is that 8.5 percent agriculture growth is necessary to increase rural incomes, ensure inclusive growth, and contribute to achieving the EDPRS 2 target of 11.5 percent annual GDP growth. PSTA 3's goal for poverty reduction is to reduce the incidence of poverty from 45 percent in 2012 to 20 percent in 2020. Other targets for year 2020 include the following:

- Increase external trade (exports plus imports) to 60 percent of GDP.
- Reduce the proportion of the population in the agricultural sector to 50 percent.
- Raise the share of agricultural operations mechanized to 40 percent.
- Reduce the Gini coefficient (a measure of income inequality) from 0.454 to 0.350.²⁴
- Increase the number of off-farm jobs from 200,000 in 2000 to 3.2 million in 2020.
- Provide 100 percent of the population with access to clean water and sanitation.
- Increase the share of the population living in urban areas to 35 percent.
- Reduce the infant mortality rate to 27 percent.
- Achieve a literacy rate of 100 percent.

To achieve the PSTA 3 targets, it is important to identify lessons learned from PSTA 2/CAADP 1 and remaining unresolved risks. Many factors were responsible for the rapid agriculture sector growth in Rwanda, including the establishment of a good business enabling environment for both farm and off-farm activities and well-directed public investments under the guidance of CAADP 1. It is vitally important that public investment for the agriculture sector be

²⁴ The Gini coefficient measures the extent to which income distribution within an economy deviates from a perfectly equal distribution. A Gini coefficient of 0 indicates perfect equality and a Gini coefficient of 1 indicates maximum inequality.

sustained under PSTA 3 and directed in ways that are most cost-effective in achieving the goals of EDPRS 2 and Vision 2020.

Despite recent gains, Rwanda's agriculture sector faces structural bottlenecks.²⁵

Agricultural land plots are very small (80 percent of land holdings are less than 1 hectare, often divided into three or four plots), and more than 70 percent of agricultural land is on hills or the side of hills, making mainstream commercial agriculture difficult. Agriculture is dominated by small-scale, subsistence farming; traditional agricultural practices (99.8 percent is farmed manually, with traditional hand hoes); and rain-fed agriculture. Irrigation is underdeveloped and not yet widespread (only 0.6 percent of agricultural land is under irrigation), use of improved seed is still constrained, and only one-third of farmers are using fertilizers (although the number is rising). As a result, average crop yields are well below potential. To tackle these structural bottlenecks in order to ensure that growth translates into further poverty reduction, EDPRS 2 envisages considerable investment in agriculture, focusing on agricultural productivity and rural infrastructure.

If not addressed, these structural bottlenecks will continue to expose the agriculture sector to risks. Agricultural risk is defined as an unpredictable event that causes loss or decline to agricultural production or income. Adverse movements in agricultural commodity and input prices, together with production-related shocks (from, for example, weather, pests, and diseases) not only affect farmers and firms, they also affect the economy through trade and foreign exchange

earnings. Reliance on rain-fed production and undeveloped irrigation make production vulnerable to abnormal weather. In 2001 and 2004, for instance, 5 percent of agricultural production is estimated to have been lost as a result of excessive rainfall; in 2007 and 2008, 8 percent of agricultural production is estimated to have been lost to drought. Low use of fertilizer, limited disease control measures, and poor postharvest management could make it difficult to prevent pests and disease from spreading. In addition, coffee and tea, which together account for 20 percent of Rwanda's goods exports, are sensitive to fluctuations in international commodity prices.

Some policies that helped Rwanda meet PSTA targets are also likely to increase exposure to agricultural risks.

The PSTA 3 strategy aims to intensify agriculture and animal resource production through land consolidation, mono-cropping, and a larger livestock subsector. Although these structural transformations would increase productivity, they would also increase the sector's exposure to risks, such as the rapid spread of pests and disease and irregular weather events. The PSTA 3 strategy to develop value chains will likely promote the production of a more limited number of varieties for certain crops and increase stored volumes from today's relatively low levels. Unless these risks are properly managed, this policy is likely to increase vulnerability to pests and disease in the field and in storage and exacerbate the negative impacts of existing risks, resulting in a less conducive investment climate and a slowdown in the development of agricultural value added and processing.

²⁵ The government's target annual growth rate for the agriculture sector was 9 percent. The CAADP target was 6 percent.

2.3 Risks in the Agriculture Sector

a. Production Risks

Production risks are events that reduce agricultural output at the farm level. They include abnormal weather, natural disasters, and pest and disease outbreaks.

Weather-Related Risks

Weather-related risk—including drought, erratic temperatures, floods, hailstorms, and mudslides—pose major risks to producers. There are no clear patterns of systemic weather risks on crop production at the national level, and the frequency of substantial rainfall deficit in a given season is low. However, the probability of erratic rainfall and short-term moisture stress is high. Although hailstorms and mudslides imply significant risk to individual farmers, they do not pose systemic risks to the sector at the aggregate level.

Drought, unpredictable weather, and extreme temperatures are major risks for both food and export crops. Maize is especially vulnerable to drought, because it requires constant moisture for optimum growth; yields fall if maize is allowed to wilt for more than 48 hours. While losses are not visible at the national level, impacts can be observed at the provincial level. In 2008 erratic rainfall caused yield losses for 37 percent of smallholders in the Eastern Provinces and 26 percent of smallholders in the Southern Provinces. Nineteen percent of smallholders in the Northern Provinces and 14 percent in the Western Provinces incurred losses (Comprehensive Food Security and Vulnerability Analysis data). There is a clear relationship between coffee yield and drought, although the impact is more visible at the provincial than the national level. All tea produced in Rwanda is rainfed and therefore subject to drought risk. In 1999, 2002, 2004, 2008, 2011, and 2012, tea yields and production declined as a result of unpredictable weather events (erratic rains, drought, and floods in

marshlands). However, national wide systemic losses have not been observed for most major crops in recent years.

Drought also affects the livestock subsector, in a number of ways. First, it reduces the water intake of animals, which is critical for their well-being. Second, it reduces the water available for production, which affects activities such as animal shed cleaning and milk hygiene and handling. As a result, the incidence of disease among cattle rises and the quality of cattle products falls. Third, it reduces the availability of feed. This problem is especially severe in Rwanda, where access to commercial feeds is limited, forcing farmers to rely on rain-fed pastures and open water sources (Techno Serve Rwanda 2008). Milk production has fallen by as much 60 percent during a drought (Olsson 2012). The 2002/03 and 2007/08 droughts had the greatest impact on milk production and milk yield over the past decade (Table 2.4). In both cases, despite an increase in the number of milking animals, milk production fell as a result of lower water availability. In contrast, there was a significant increase in national milk production and milk yield in 2010, despite a drought in the Eastern Province, arguably because good rains and improved breeds increased production in other parts of the country. Fourth, drought often forces pastoralists to move their herds in search of feed and water, sometimes to neighboring countries or national park areas. Cattle cope poorly during these long moves, yielding less milk and becoming more susceptible to disease. The moves also increase the risk of transboundary disease outbreaks.

Table 2.4: Impact of drought and dry spells on milk production in Rwanda, 2002–10
(percent change)

Item	2002 /03	2005	2007 /08	2010
Milk production	–11.0	–1.2	–13.0	26.7
Heads of milking animals	8.9	–0.4	9.9	0.9
Milk yield	–18.3	–0.8	–20.8	25.5

Sources: FAOSTAT and World Bank staff calculations.

Crop Pests and Diseases

Unmanaged pests and diseases cause high losses for producers in Rwanda, in both the field and storage. Although pests and diseases are of an endemic nature and outbreaks are not visible in national yield data, impacts from individual pests and diseases are significant. Omnipresent pests and diseases, including beanflies, the antestia bug, cassava mosaic virus, coffee leaf rust, and banana bacterial wilt, cause widespread losses. Losses vary depending on environmental conditions, crop varieties, altitude, temperature, and precipitation. In the future, pests such as maize stalk borer may spread more rapidly and affect larger areas, as the structure of the sector changes into larger mono-cropped land areas with more homogenous varieties. Unless addressed, the risk of aflatoxin contamination could also increase as the livestock subsector expands and demand for animal feed and feed storage capacity increases (Box 2.1). In addition, climate change projections indicate a more favorable environment for certain pests and diseases to flourish.

Box 2.1 What are aflatoxins?

Aflatoxins are toxins produced by mycotic (fungal) organisms that grow in poorly stored animal feeds. In countries with developed animal feed industries, aflatoxins have caused poisoning that has led to death, depending on the level of contamination.

The Rwanda Ministry of Agriculture is promoting the intensification of dairy farming, which will require commercial feed production and distribution. Toward that end, it is supporting the construction of animal feed factories, two of which are under construction. Aflatoxin poisoning will be a challenge that could destroy the industry unless appropriate regulation and enforcement measures are introduced in the nascent stages of the industry's development.

Livestock diseases can have a significant impact. Among the most common outbreaks are foot and mouth disease, contagious bovine pleuropneumonia, anthrax, black quarter, and lumpy skin disease (Table 2.5). Incidents have been attributed to the movement of cattle across the borders with the DRC, Tanzania, and Uganda. In the event of an outbreak, the Rwanda Agricultural Board quarantines the affected area; livestock and livestock products cannot be sold or transported out of the zone until the ban is lifted. The measure disrupts trade and may cause prices to fall. In addition, depending on the nature of the outbreak, the government may slaughter and destroy animals and animal products within the affected area. Rwanda experienced devastating outbreaks of livestock disease in 2008 and 2012. The two years account for half of all outbreaks, number of susceptible animals, and cases seen between 2002 and 2012. Both years saw foot and mouth disease, anthrax, and lumpy skin disease epidemics.

b. Market Risks

Market risks are unpredictable changes in supply and/or demand that affect prices of inputs and outputs; market demand for quantity and/or quality attributes; food safety requirements; and enterprise reputation and dependability. Agricultural exports are heavily exposed to market risks. These risks are more limited for food crops.

Market Risks for Food Crops

Market risks are generally limited for food crop producers. As most markets are local, prices fluctuate seasonally based on domestic supply and

Table 2.5: Disease outbreaks in Rwanda, 2002–12

Disease	Number of outbreaks	Number of animals susceptible	Number of cases	Number of deaths	Number of animals destroyed	Number of animals slaughtered
Foot and mouth disease	48	266,429	758	93	262	68
Contagious bovine pleuropneumonia	12	351,219	1,706	97	27	—
Lumpy skin disease	123	730,195	2,434	81	91	—
Anthrax	160	929,906	2,097	362	122	106
Total	343	2,277,749	6,995	633	502	174

Sources: FAOSTAT and World Bank staff calculations.

demand, unless the harvest is hit by production risks. Domestic markets for commodities such as beans seem to be well integrated, with limited fluctuations. Nevertheless, prices in Rwanda are influenced by the availability of postharvest infrastructure, lack of which can cause volatility. Producer prices in developed processing industries, such as cassava and beer bananas, tend to be more stable.

Prices in neighboring countries affect domestic prices through trade, but global price fluctuation have little influence on Rwandan prices. High transportation costs effectively isolate Rwanda from global price fluctuations of perishable commodities. Prices in neighboring markets have greater impact, but they do not result in significant volatility across seasons. For certain products, such as cassava, foreign markets help smooth price fluctuations in times of overproduction. For products like maize, imports stabilize seasonal fluctuations. Rwanda's membership in the East African Community and adherence to open trade policies also supports domestic price smoothing. Nevertheless, producers of potatoes, rice, and bananas other than beer bananas face certain marketing risks.

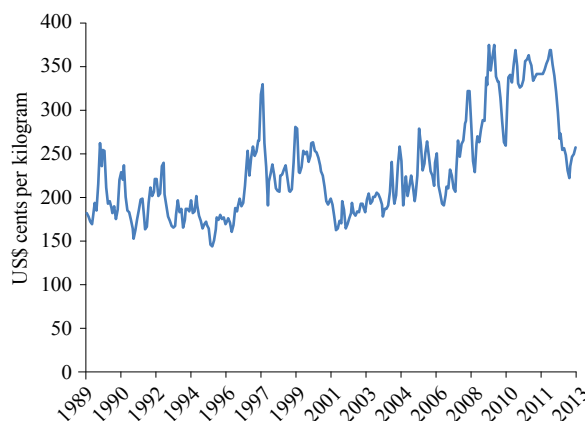
Market Risks for Export Crops

Unlike food crops, export crops face significant market risks. The structure of export crops differs from the structure of food crops. Exports crops are exposed to exogenous risks, including international price volatility caused by global supply and demand, exchange rate fluctuations, and other countries' trade policies. As discussed in the previous section, growth projections are heavily dependent on the market risks for export crops.

Price volatility risks affect tea farmers' profits and export earnings. The National Agricultural Export Development Board (NAEB) sets tea production prices every four months, based

on a range of factors, including international auction prices and the exchange rate. Mombasa auction prices and international prices for tea have fluctuated, particularly in the past few years (Figure 2.2). Farm gate prices fixed by NAEB for green leaf tea increased 31 percent in 2013 and decreased almost 18 percent in 2014.

Figure 2.2: Monthly tea prices at the Mombasa auction fluctuate widely

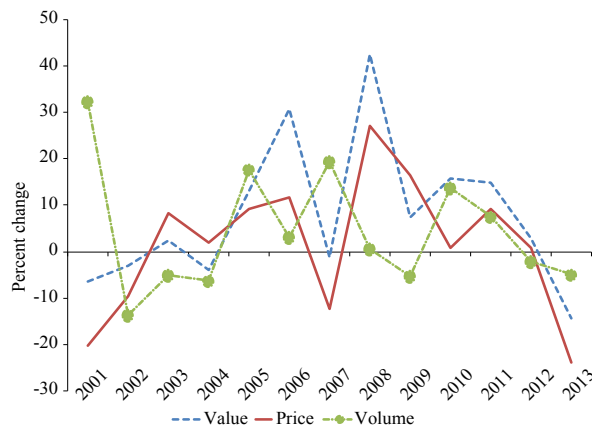


Sources: NAEB and World Bank staff calculations.

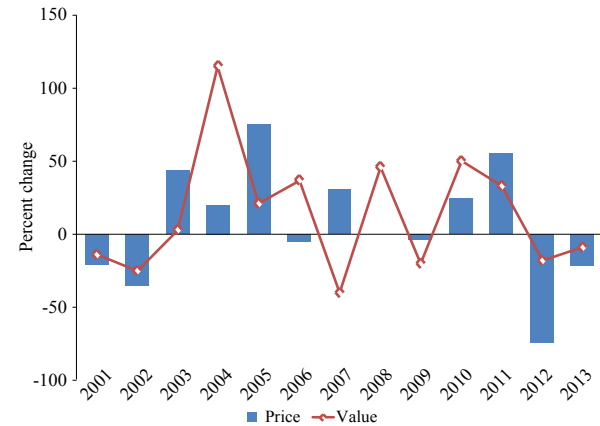
Fluctuations in tea production and prices affect Rwanda's export earnings. The value of Rwanda's tea exports tripled between 2000 and 2013, but growth was not consistent, with both the quantity exported and international tea prices fluctuating (Figure 2.3). Declining prices played an important role in the value of tea exports, especially in 2001, 2007, and 2013.

Coffee prices in Rwanda follow international prices, resulting in price volatility risk (Figure 2.4). There is no predictable pattern in coffee prices. Prices fell in 2001, 2002, 2012, and 2013 and increased between 2003 and 2011. Exporters and processors use mechanisms such as forward basis prices to be fixed (PTBF) and call options to hedge against price volatility risk. In contrast, farmers and washing stations bear the cost of price volatility themselves.²⁶

²⁶ The farmers the team met confirmed that prices are unpredictable. One farmer reported that in 2013, prices ranged from Rwf 130 to Rwf 350 per kilogram for the same coffee. According to this farmer, coffee prices were his main concern, as it made it difficult to plan his activities.

Figure 2.3: Price fluctuations drove the value of tea exports between 2001 and 2014

Sources: MINECOFIN, NAEB, and World Bank staff calculations.

Figure 2.4: Both the international price of coffee and the value of Rwanda's coffee exports fluctuate widely

Sources: NAEB and World Bank staff calculations.

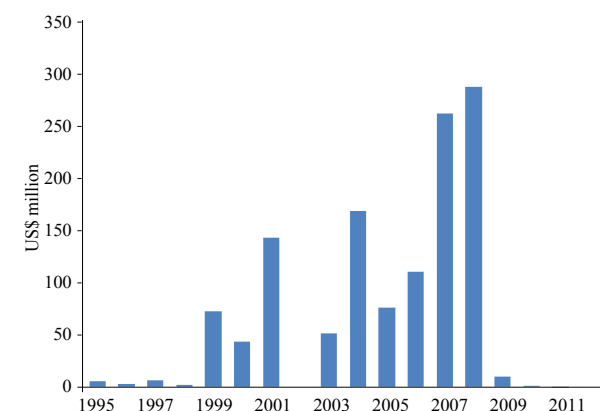
Coffee price volatility has a major effect on export earnings (Figure 2.4). The value of coffee exports fell in 2001, 2002, 2007, 2009, 2012, and 2013, as a result of the decline in both production and the international price of coffee. During 2011 the quantity exported decreased but

export earnings increased, thanks to the rise in international coffee prices. In 2012 and 2013, the value of coffee exports declined even though the quantity exported increased, as a result of the drop in international coffee prices.

2.4 Impacts of Risks

Although systemic risks to agricultural production are low in Rwanda, local and commodity specific risks remain, causing important losses to the sector. Agricultural risks have important consequences for productivity, growth, and the government's efforts to transform the sector and meet targets under PSTA 3/CAADP 2. Understanding how frequently risks occur, how much is lost in each risk event or for each crop, and where these losses occur will help policy makers identify and target risk management interventions in a way that has the greatest impact.

Risks to the agricultural sector cause production losses that averaged US\$65 million a year between 1995 and 2012 (US\$1.2 billion in 18 years)—about 2.2 percent of Rwanda's annual agricultural production (Box 2.2).²⁷ Even if adjusted downward using different assumptions, losses are large and affect Rwanda's growth objectives. Losses became significantly larger in the 2000s. The largest losses occurred in 2008, when 8.9 percent of the value of total agricultural production was lost (Figure 2.5 and Table 2.6).

Figure 2.5: Losses became significantly larger in the 2000s

Sources: FAOSTAT and World Bank staff calculations.

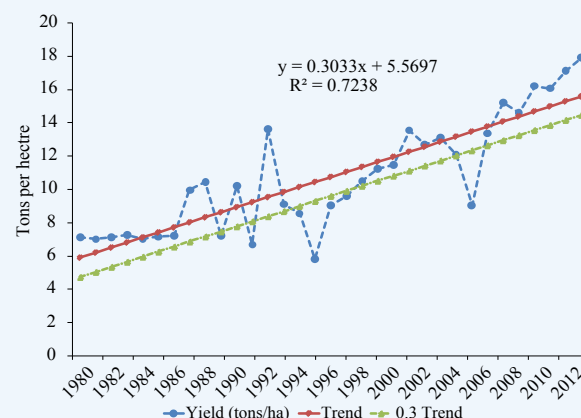
²⁷ Because losses caused by market and enabling environment risks are difficult to measure quantitatively, this subsection focuses on production losses, which can be estimated using yield data.

Box 2.2 How is production loss measured?

Estimation of losses as a result of agricultural risks considers primarily production losses caused by weather-related events, such as drought, floods, erratic rains, landslides, and hail; diseases; and pest outbreaks. The following method was applied to calculate production losses in a particular year:

- A historical linear trend line for yields of each crop was constructed.
- A second linear trend line was drawn, representing one-third of the standard deviation of the crop yields.
- Years were identified as loss years if actual yields were below the linear trend line.
- Production losses were calculated based on the difference between the predicted value (the original trend line) and actual yields.

Losses were summed and divided by the total number of years examined in order to determine the average annual loss rate for a particular crop. This figure was then converted into value terms using the producer price for the crop. As producer prices are in local currency, the value was then converted into U.S. dollars using the average exchange rate. Box Figure 2.3.1 shows an example of this procedure.

Box Figure 2.3.1: Calculation of production losses

Source: World Bank staff calculations.

Table 2.6: Cost of adverse weather events for crop production

Year	US\$ millions	Percent of total value of average agricultural production 2009–11	Cause/risk event
2001	138.2	–4.6	Excessive rainfall in Northern and Western Provinces
2004	150.1	–5.0	Heavy rains in high-altitude areas and drought in Eastern and South Eastern Provinces
2006	87.1	–2.9	Drought/high heat in Eastern and South Eastern Provinces
2007	238.2	–7.9	Drought in Eastern Province
2008	269.0	–8.9	Drought in Eastern Province

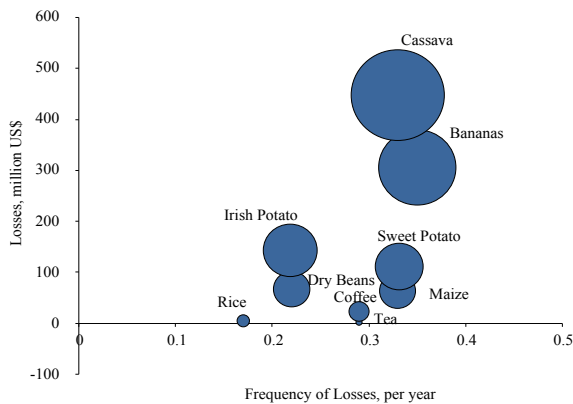
Sources: FAOSTAT and World Bank staff calculations.

Note: Banana, tea, and coffee losses were calculated for 1995–2011 as a result of limited data. Cassava, paddy rice, sweet potatoes, maize, dry beans, and Irish potatoes were calculated for 1995–2012. Table shows years in which major losses occurred.

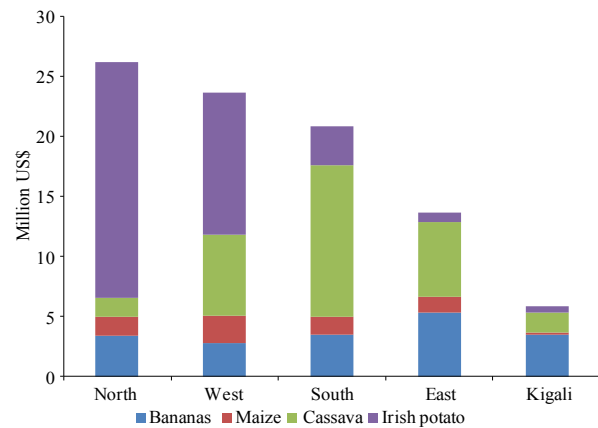
The scope of the losses is in line with the importance of the crop, in terms of agricultural production value (Figure 2.6). There are important differences across crops, however. Cassava and bananas saw the largest losses in 1995–2012, followed by Irish potatoes and sweet potatoes. Maize suffered frequent losses, but the losses were not as large as for the first four crops. These variations in crop losses have implications for risk management policy decisions regarding resource allocations for risk mitigation.

Disaggregating losses and considering risks at the provincial levels would help target policies and interventions. In absolute terms, losses are

greatest in the Northern Province and smallest in Kigali (Figure 2.7). The bulk of the losses of Irish potatoes are in the North, but losses in the West are also substantial. Most cassava losses are in the South, followed by the West and the East. Banana losses are more evenly distributed but slightly higher in the Eastern Province and lowest in the Western Province. Maize production has the lowest losses in absolute terms. They are slightly higher in the Western Province. Although the Northern Province has the highest aggregate losses in absolute terms, the geographical target area for any risk management intervention will depend on the crop.

Figure 2.6: Losses in 1995–2012 were greatest for cassava and bananas

Sources: FAOSTAT and World Bank staff calculations.

Figure 2.7: The geographical distribution of annual losses varies by crop

Sources: NISR and World Bank staff calculations.

Note: Volatility across provinces was measured using the coefficient of variation of yields, which was calculated as the standard deviation from the series arithmetic median. It shows the extent of variability in relation to the mean of the population. A loss model was created for four crops (maize, bananas, cassava, and Irish potatoes) for 2000–12 based on disaggregated data from MINAGRI. Losses are from seasons A and B.

2.5 Implications of Structural Shifts and Long-Term Trends

Long-term trends and structural changes in the agricultural sector could affect the incidence and severity of different types of risk. Maximizing productivity and competitiveness in the sector will require risk management interventions that take into account the evolving nature of risk.

Long-term trends—particularly climate change and structural changes that the government is promoting to increase productivity—will alter Rwanda’s exposure to risks. Currently, Rwanda is subject to fewer large-scale disasters, such as national droughts or locusts, than many of its neighbors.²⁸ It has experienced only one year of negative growth in the agriculture sector since 1994. This situation could change, however. As Rwanda pursues growth-enhancing objectives under PSTA 3/CAADP 2, such as land consolidation, mono-cropping, livestock intensification, and value chain development, the impact of agricultural risks may grow, as reliance on a single crop and single variety increases both production and market risks. Agricultural risks could increasingly threaten achievement of the targets under PSTA 3/CAADP 2.

Land consolidation and mono-cropping facilitate the spread of pests and disease. Maize, for example, a crop for which land is being consolidated, is subject to more frequent risks than many other crops. The practice of mixing local varieties for crops, an important risk-mitigating practice among bean producers, is likely to be replaced with single-variety cultivation as output markets become more sophisticated.

Stored crops are vulnerable to pests. Losses during storage will increase as grain is stored in larger volumes and for longer periods. Insect damage from common pests of stored maize and rice (weevils such as *Sitophilus zeamais* and *Sitophilus oryzae*) is not unusual, but as grains are currently stored for only short periods in Rwanda, losses have generally been low and storage pests not a significant risk for growers

²⁸ Many countries in Sub-Saharan Africa experience recurring negative agricultural growth as a result of various shocks. Malawi, for instance, experienced negative agriculture GDP growth six times between 1990 and 2014.

or millers. Unless addressed, these risks may increase as postharvest infrastructure expands. Although some level of infestation is inevitable, good storage practices can contain infestations. Practices include using resistant varieties, coating seeds with edible oil (which kills bruchid eggs), storing grains anaerobically, and using fumigants.

Growth in livestock production and consumption will increase sanitary and food safety risks. More animals means greater impacts in the event of disease outbreaks, especially as livestock owners hold more cattle or cattle are located closer to one another. With limited land in Rwanda and no grazing policies, more animals will also increase demand for fodder, which will increase the impact from aflatoxins (see Box 2.1). Greater demand for livestock products as a result of rising income increases the potential impacts from food safety risks, as supply chains grow and products reach more consumers.

The occurrence of pests and disease seems to be on the rise, with some diseases spreading more rapidly than in the past. Banana bacterial wilt is occurring more frequently and spreading rapidly. First found in Rwanda in 2005, it had spread to 23 of Rwanda's 30 districts by 2012. Levels of maize pests and diseases are low; until 2013 only leaf blight and maize streak virus were recorded as significant diseases of the growing crop (MINAGRI 2008). However, in June 2013 maize chlorotic mottle virus was identified in the Western and Northern Provinces. This virus is a component of maize lethal necrosis disease, a disease complex that has spread rapidly in Kenya since 2012 and that can cause up to 100 percent loss of yield. It poses a significant potential threat to future maize production.

2.6 Risk Management

Risks may emerge as the sector develops and markets grow. Productivity increases are likely to give farmers better access to inputs and the knowledge to mitigate these risks. It is important that the appropriate institutions and actors be in place to facilitate this transition. The government and development partners fund programs and activities that seek to increase resilience to agricultural risks. Businesses, individual farmers, and consumers can adopt other measures, such as dealing with higher prices and limited availability of certain commodities by switching to others. A comprehensive risk management plan would examine how effective existing activities are and how sufficient their coverage is, identify gaps, and consider options for better management practices. A risk management plan should identify linkages between risks, prioritize risks, and take into account the feasibility of implementing interventions in the Rwandan context, considering budget, institutional, and human capacities. Any agricultural risk management plan should support Rwanda's strategic goals and growth objectives for the agricultural sector.

a. Identifying Risks and Prioritizing Interventions

Identifying risks and prioritizing interventions for identified risks are important first steps in designing a set of comprehensive and effective measures to manage risks. Given Rwanda's scarce budgetary resources, it is crucial that policy makers prioritize interventions for dealing with them based on frequency of occurrence and degree of impact of key risks.

Based on frequency and severity, the main risks to Rwanda's agricultural sector are regarded as pests, disease, and weather-related risks for crops and livestock and price volatility for export crops and dairy producers (Table 2.7). These risks occur with higher probability every three years, with relatively higher impact compared to other types of risks. Structural changes in the sector may exacerbate them in the future. The impacts of pests and disease are expected to rise as a result of increased mono-cropping, land

Table 2.7: Risk prioritization matrix for Rwanda's agriculture sector

Probability of event	Impact of risk		
	Low	Moderate	High
High (1 year in 3)	• Potato taste (coffee) • Landslide (all crops) • Local and large-scale floods (all crops) • Milk contamination (dairy) • Power cuts at milk collection centers (dairy) • Counterparty risk (coffee) • Price volatility (food crops and milk) • Exchange rate volatility (export crops)	• Price volatility (export crops) • Disease outbreaks (livestock)	• Pests and diseases (all crops) • Drought and erratic rains (all crops and livestock)
Moderate (1 year in 5)	• Hail (all crops)		
Low (1 year in 10)	• Glut (dairy) • Frost (tea) • Losses in transit (tea) • Aflatoxins in feed (livestock) • Maize shortage (dairy)		

Source: World Bank Agriculture Risk Management Team.

Note: Data on some crops and some risks were not available. This table is therefore not exhaustive. The ranking of risks is based on the team's evaluation based on both data analysis and on-the-ground research.

consolidation, use of storage, and higher growth in the livestock subsector. The impacts of adverse weather conditions, such as drought and erratic rains, will remain high if measures to address underdeveloped irrigation are not addressed. Price volatility will continue to affect producers of export crops and dairy products unless an improved market information system and risk-hedging mechanisms are put in place.

b. Suggested Interventions for Agriculture Risk Management

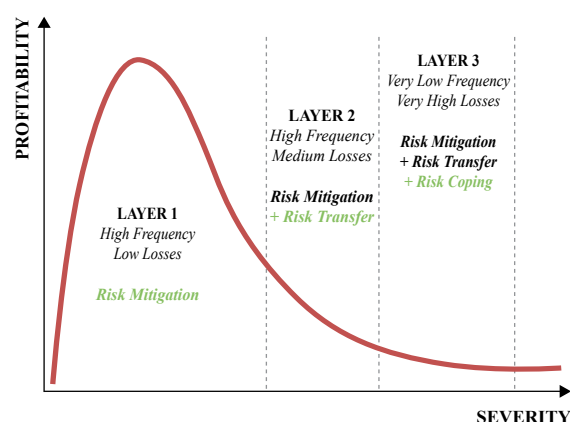
In addition to ongoing interventions in risk management, the government could implement targeted interventions to more effectively manage risks. The potential interventions identified below complement the lessons learned under PSTA 2/CAADP 1 and highlight risk management areas that require special attention based on the risk assessment and feedback from stakeholders in a dedicated consultative workshop. As they are mainly risk-mitigating mechanisms, they are win-win in nature, contributing to improved agricultural productivity for many producers and general agricultural growth in the sector.

Risk management measures can be classified into three types:

- *Risk mitigation measures* are ex ante actions designed to reduce the likelihood of risk or the severity of losses. Such measures are often win-win practices, in that they reduce the impacts of agricultural risks on farmers while at the same time improving productivity. Examples include soil and water conservation measures; changes in cropping patterns; adoption of practices that improve performance and reduce risks, such as use of conservation farming, short cycles, and tolerant varieties; and creation of improvement of irrigation and flood control infrastructure.
- *Risk transfer measures* are ex ante actions that transfer the risk to a willing third party for a fee. These mechanisms usually trigger compensation in the case of a risk-generated loss. They include insurance, reinsurance, and financial hedging tools.
- *Risk coping measures* are ex post actions that help the affected population and the government cope with loss. They usually take the form of compensation (cash or in-kind), social protection programs, and livelihood recovery programs (for example, government assistance to farmers, debt restricting, and contingent financing).

How instruments are applied for a given risk depends on the probability of the risk and the severity of its impact (Figure 2.8). Any risk strategy will likely include a combination of all three types of risk management instruments (Table 2.8). Joint implementation has positive, complementary impacts while addressing multiple risks and contributing to improved risk management in the short, medium and long terms. Risk mitigation measures are often most cost-effective interventions, and successful examples of these types of measures are highlighted in Box 2.3. Implementing risk management interventions will require integrating risk management approaches in existing policies and programs and a risk management plan (Box 2.4). (For Niger's experience designing and implementing a risk management plan, see Box 2.5.)

Figure 2.8: The choice of strategic risk instrument depends on both the probability and severity of the risk



Source: World Bank Agriculture Risk Management Team

Table 2.8: Potential interventions for risk management in agriculture

Risk	Risk mitigation	Risk transfer	Risk coping
Pests and diseases	• Integrated pest management • Pest- and disease-tolerant varieties • Good agricultural practice/extension services • Information systems/increased border surveillance (livestock) • Vaccination (livestock)	• Insurance (livestock)	• Rapid disease response system • Vaccination
Drought/ erratic rain	• Soil and water conservation • Training in improved agronomic practices • Drought-tolerant varieties • Irrigation	• Insurance	• Social safety net programs and emergency relief • Grain aggregation • Storage network • Savings groups
Floods	• Soil and water conservation • Drainage • Flood-tolerant varieties • Good agricultural practices/extension services • Infrastructure	• Insurance	• Social safety net programs and emergency relief • Grain aggregation • Storage network • Savings groups
Domestic price volatility	• Improved market information systems • Training on milk handling and hygiene	• Hedging	• Social safety net programs and emergency relief • Grain aggregation • Storage network (crops and cold chain storage and transportation for milk) • Savings groups
International price volatility	• Improved market information systems • Regional trading system • Shorter farm to export time • Training on milk handling and hygiene	• Futures contracts • Hedging • Options to buy/sell on international exchanges	• Social safety net programs and emergency relief • Grain aggregation • Storage network • Savings groups

Source: World Bank Agriculture Risk Management Team.

Box 2.3 What Works in Sub-Saharan Africa? Successful Risk Mitigation Interventions

Integrated Pest Management (IPM) is an ecosystem approach to pest and disease control that combines different management strategies with minimal use of synthetic pesticides. The approach seeks to reduce the incidence of pests and disease outbreaks efficiently, keeping the economic costs of both outbreaks and interventions low. Successful IPM programs help farmers increase awareness of causal relationships, improve their decision-making skills and adopt good agricultural practices (GAPs). In Mali rice farmers participating in IPM interventions registered a 38 percent increase in yields and a 41 percent increase in net value over conventional farming practices (FAO 2014).

Rainwater harvesting is a water management practice that captures and stores rainfall from roofs, constructed catchment surfaces, and streets. The practice can be implemented as a stand-alone intervention or as a complement to small-scale irrigation projects. Since drought and erratic rainfall events are expected to increase under climate change scenarios, rainwater harvesting is considered a climate-smart adaptation measure. In Burkina Faso and Kenya, where competition for water resources among farmers and pastoralists is increasingly intense, rainwater harvesting projects resulted in net profits of US\$150–US\$600 and US\$110–US\$500, respectively (Ngigi 2009).

Community animal health worker (CAHW) programs provide training and involve counterparts from government veterinarian authorities. They have improved livestock disease surveillance and vaccination rates in East Africa and the Horn of Africa (Leyland et al. 2014). In countries where national capacity to manage disease surveillance information and deliver services is low, CAHWs complement the capacity of government services. The most successful programs incorporate a sustainable business model in which CAHWs purchase drugs from licensed private pharmacies and are supported by interventions to strengthen regulatory bodies for veterinary pharmaceuticals.

Box 2.4 What strategies do policymakers recommend for integrating agricultural sector risk management in practice?

In November 2014, policy makers from seven countries in Sub-Saharan Africa gathered with various development partners at a Policy Workshop on Agricultural Sector Risk Management to share their experience from integrating risk management into their regular agricultural programs. In a working session, participants were asked to jointly elaborate comments or recommendations on four issues/questions. Their comments are summarized below:

1. What are barriers to integrated government approaches to managing agricultural risks?

- The structure of agricultural ministries, made up of departments with their own priorities, personalities, and power struggles, creates a barrier to integrated approaches.
- Institutional alignment mechanisms are needed to overcome the lack of coordination between ministries, particularly the Ministry of Finance and the Ministry of Agriculture.
- Contradictory policies, such as food security policies that keep grain prices low at the expense of farm incomes, can undermine risk management.

2. How can short-term political economy issues be overcome in order to invest in long-term resilience?

- Inter-ministerial coordination and donor coordination should be improved to overcome project-based silos.
- To overcome short-term political realities, governments must create incentive structures for long-term thinking.
- The government should build a critical mass of staff that understand analytical tools and how to apply them.

3. How can ex post humanitarian responses be better integrated with ex ante risk mitigation measures?

- A risk prioritization should be conducted so that mitigation measures can be implemented before high-frequency/high-loss events occur.
- Countries should move away from a project-based approach and coordinate with development partners, who have their own agendas.
- Countries should use sector-wide approaches to encourage an attitude of cooperation rather than competition for resources and control.

4. How can policy makers convince the Ministry of Finance of the relevance of investing in risk management tools and strategies?

- Calculate and share information on the cost of agricultural losses due to major risk events.
- Present budget figures on the cost of coping mechanisms versus the cost of risk mitigation.
- Pursue a cross-ministerial approach to integrated long-term planning and budget reorientation.

Source: Forum for Agricultural Risk Management in Development 2014.

Box 2.5**What can Rwanda learn from Niger's experience designing and implementing an agricultural risk management program?**

The World Bank, in collaboration with Niger's 3N Initiative, a national food security strategy led by the President's office, conducted an agricultural sector risk assessment in 2012 to help prioritize risks and solutions to building the resilience of Niger's agricultural sector. The process resulted in the government of Niger developing the Plan d'action pour la gestion des risques agricoles au Niger (PAGRA). The 3N Initiative considers the PAGRA a critical tool for long-term planning in Niger, which suffers from frequent shocks and losses from agricultural risks. This 10-year action plan (2014–23) sets short-, medium-, and longer-term targets, with the overriding goal of strengthening the resilience of rural and semiurban communities against the main agricultural risks. The Bank is supporting the government's efforts to operationalize PAGRA with a US\$116 million investment operation. The government of Niger is working toward implementing PAGRA, developing coordinating structures, identifying good practices, planning for scale-up of interventions, setting quantitative targets and identifying target groups, and sharing experiences at different levels of governments. Niger's experience of operationalizing risk management could help inform other countries' efforts toward building resilience.

Source: World Bank Agricultural Risk Management Team.

Water management measures can yield significant productivity gains and help mitigate the effects of climate change. Recommended measures include expansion of on-farm water harvesting systems; adoption of viable mechanisms for financing small-scale irrigation; expansion and rehabilitation of drainage infrastructures in valleys; and adoption of agricultural practices, including minimum tillage agriculture, to improve soil moisture and reduce flooding. All of these measures are effective and efficient at mitigating the risks of drought, floods, and landslides. They are generally undertaken on individual farmland or at the community level. Measures involving a broader watershed or landscape approach require coordinated measures across a number of communities. A lesson learned from PSTA II is that hillside irrigation is so expensive that it is likely to be profitable only for high-value agriculture.

Some weather-risk management measures in the livestock subsector, such as improvements to rural water infrastructure, would also benefit the crop subsector. Others would primarily benefit only the livestock subsector. The Livestock Infrastructure Support Project is setting up livestock watering facilities for farmers. Currently, it is working only in the Nyagatare district, where it is focused on dairy farmers. The program will probably be rolled out to other districts, especially in the Eastern Province, which experiences more rainfall

variability, dry spells, and droughts than the rest of the country. Developing existing feed supply chains to temporarily substitute for the lack of pastures in regions where grazing is allowed would increase resilience to localized drought. Training farmers in livestock management in water-scarce situations would increase coping capacity in the face of erratic rainfall. Training in good animal hygiene practice should include a focus on practices during dry periods.

Improved pest and disease management in crop production is needed, in particular as it relates to potential future risks as a result of land consolidation and increased monocropping. Potential changes in the frequency and severity of pest and disease outbreaks as a result of climate change should be integrated in interventions aimed at mitigating the risk of pests and diseases. Use of pesticides in Rwanda is very low; they are used mainly in coffee, potatoes, and tomatoes. With the increased focus on and promotion of horticultural crops, integrated pest management may become increasingly important. Potential measures to improve pest and disease management in the crops sector include improving agricultural practices and pest management; strengthening the crop research system on pest and disease management and resilient crops; strengthening access to inputs, including by developing a network of input dealers; and developing information system on pests and diseases.

Livestock disease management infrastructure is needed to mitigate and manage disease outbreaks. Vaccination is used in disease management as both an ex ante and ex post solution to disease outbreaks. Although the Rwanda Agricultural Board has been vaccinating animals since 2002, several outbreaks occur every year. Vaccination coverage in 2014 was 30 percent for foot and mouth disease, 26 percent for contagious bovine pleuropneumonia, 23 percent for anthrax, and 14 percent for lumpy skin disease. Part of the solution may lie in increasing coverage, if possible to 100 percent, particularly for anthrax and lumpy skin disease, which have higher incidences than other diseases. Other interventions may include creating livestock information systems, including animal registers and disease warning systems; developing veterinary services and vaccination programs; strengthening animal reference laboratory capacity; and increasing regional cooperation in livestock disease management.

Sanitary institutions and practices in the livestock subsector need to be strengthened throughout the supply chain, by both public and private actors. As incomes increase, the livestock subsector is likely to grow. It will be important to have the necessary institutional infrastructure in place to mitigate risks and minimize losses. Support should be provided for investments in transportation, modern abattoirs in every major town, antemortem and postmortem inspections, food safety laboratories, and increased capacity of the Rwanda Bureau of Standards to monitor and certify meat products and processing facilities. These investments should be complemented by training in meat handling and hygiene for traders, transporters, abattoir and processing facility workers, and

inspectors. Similar investments should be made throughout the dairy value chain to promote good hygiene practices and prevent contamination, including at the farm level. Mitigating aflatoxin contamination in the feed supply chain is also important for animal food product safety.

Price management mechanisms are needed for actors in the export crop supply chain. Given the exposure to international prices for actors in the coffee and tea supply chains, there is scope for strengthening price management mechanisms. By analyzing the physical and financial flows of current transaction arrangements for exports, policy makers can identify a set of options for reducing exposure. Potential measures may include strengthening existing price information systems that allow for transparent price setting throughout the supply chain; training actors throughout the chain to optimize from available information; and training producers and producer organizations in price risk management, such as forward PTBF contracting.

The government is already acting in all of these areas. However, given the risks identified in this analysis and the strategic path the government has outlined for the sector, there is room for strengthening efforts. As discussed above, risks to the agriculture sector affect productivity and incomes as well as competitiveness and the long-term investment climate. Several areas (for example, water management for crops, feed and fodder management and improved water supply for livestock, and pest and disease management) would also be part of a climate-smart agriculture approach. Regardless of the specific objectives for the sector, effective agricultural risk management is an integral part of any agricultural development strategy.²⁹

²⁹ The World Bank team will conduct an assessment of risk mitigation systems in March 2015.

APPENDIX

SELECTED DATA ON RWANDA

Table A.1: Selected economic indicators for Rwanda, 2010 –14

Indicator	2010	2011	2012	2013	2014	
					First Half	Third Quarter
<i>GDP Growth rate (percent)</i>	7.3	7.8	8.8	4.7	6.8	7.8
Agriculture	4.9	4.7	6.5	3.2	5.2	5.6
Industry	8.0	17.9	8.5	9.2	6.7	4.8
Services	9.2	8.0	11.5	5.4	8.4	10.4
<i>Fiscal framework (percent of GDP)^a</i>						
Revenues and Grants	25.4	24.8	25.3	23.2	26.0	21.5
Total revenue	12.4	13.8	14.3	15.5	16.8	15.3
Tax revenue	11.9	13.2	13.4	13.7	14.8	14.6
Non-tax revenue	0.5	0.6	0.8	1.8	2.0	0.6
Grants	13.0	10.8	11.0	7.7	9.2	6.2
Budgetary grants	9.0	6.1	6.4	4.0	3.3	2.5
Capital grants	4.0	4.7	4.6	3.7	5.9	3.7
Total expenditure and net lending	25.5	27.9	26.5	28.5	30.0	27.8
Current expenditure	14.5	15.5	14.8	13.4	15.2	16.1
Capital expenditure	10.0	12.5	11.6	12.9	13.9	10.6
Domestic	5.0	6.2	5.6	5.1	6.2	5.3
Foreign	5.0	6.2	6.1	7.8	7.6	5.3
Net lending	0.9	0.5	0.0	2.2	1.0	1.2
<i>Budget deficit (cash basis)</i>						
Excluding grants	-13.4	-14.5	-12.5	-13.2	-13.4	-3.4
Including grants	-0.5	-3.8	-1.5	-5.4	-4.2	-9.6
<i>External Sector</i>						
Exports (year-on-year growth)	26.5	56.2	27.3	19.0	0.4	-0.4
Imports (year-on-year growth)	8.7	44.5	18.7	-0.4	13.0	1.6
Gross Reserves (million of US\$)	813.3	1,050.0	850.3	1,070.0	946.4	879.7
Gross Reserves (months of imports of goods and services)	4.5	5.1	4.1	4.8	..	..
<i>Consumer Price Index (percent change)</i>						
End of period	0.2	8.3	3.9	3.6	1.4	0.2
Period average	2.3	5.7	6.3	4.2	2.6	1.0
<i>Exchange rate (Rwf/US\$)</i>						
End period	594.5	603.4	631.0	667.7	681.7	685.5
Period average	583.3	602.0	614.3	646.6	677.4	686.1

Sources: NISR, BNR, and MINECOFIN.

Note: Figures are on a fiscal-year basis (July–June). For example, 2011 refers to the 2010/11 fiscal year

“..” indicates that data is not available

Table A.2: GDP in Rwanda by Kind of Activity, 2011–14

Items	2011		2012		2013		2014	
	First half	Second half	First half	Second half	First half	Second half	First half	Third quarter
GDP	1,795.0	2,051.0	2,078.0	2,359.0	2,323.0	2,541.0	2,596.0	1,393.0
Agriculture, forestry and fishing	556.0	688.0	659.0	823.0	761.0	862.0	850.0	474.0
Food crops	379.0	467.0	460.0	565.0	545.0	616.0	617.0	335.0
Export crops	25.0	53.0	25.0	76.0	28.0	51.0	34.0	37.0
Livestock and livestock products	59.0	63.0	67.0	71.0	74.0	78.0	81.0	43.0
Forestry	88.0	97.0	100.0	105.0	105.0	107.0	108.0	54.0
Fishing	6.0	7.0	8.0	8.0	8.0	10.0	10.0	5.0
Industry	256.0	299.0	288.0	350.0	346.0	379.0	375.0	193.0
Mining & quarrying	35.0	39.0	32.0	37.0	44.0	46.0	47.0	26.0
Total manufacturing	89.0	115.0	105.0	129.0	117.0	136.0	128.0	65.0
Of which:								
Food	19.0	31.0	22.0	33.0	25.0	34.0	29.0	15.0
Beverages and tobacco	45.0	55.0	52.0	63.0	60.0	67.0	65.0	32.0
Electricity	5.0	6.0	6.0	8.0	8.0	9.0	9.0	5.0
Water & waste management	6.0	7.0	8.0	8.0	8.0	8.0	8.0	4.0
Construction	121.0	131.0	136.0	168.0	168.0	181.0	183.0	94.0
Services	851.0	938.0	1,009.0	1,070.0	1,099.0	1,178.0	1,221.0	651.0
Trade and services	269.0	323.0	329.0	378.0	356.0	402.0	401.0	213.0
Maintenance & repair of motor vehicles	9.0	10.0	10.0	10.0	12.0	12.0	12.0	6.0
Wholesale & retail trade	212.0	254.0	257.0	296.0	275.0	313.0	312.0	166.0
Transport	49.0	58.0	61.0	72.0	69.0	77.0	78.0	41.0
Other services	582.0	616.0	679.0	692.0	743.0	775.0	820.0	438.0
Hotels & restaurants	48.0	51.0	52.0	54.0	54.0	56.0	57.0	30.0
Information & communication	43.0	50.0	56.0	61.0	56.0	60.0	61.0	36.0
Financial services	56.0	51.0	69.0	68.0	81.0	83.0	82.0	36.0
Real estate activities	144.0	142.0	151.0	131.0	140.0	140.0	154.0	90.0
Professional, scientific & technical activities	47.0	49.0	56.0	55.0	58.0	61.0	61.0	31.0
Administrative & support service activities	49.0	53.0	57.0	59.0	61.0	64.0	66.0	34.0
Public administration and defense; compulsory social security	48.0	68.0	68.0	79.0	78.0	88.0	86.0	49.0
Education	60.0	62.0	73.0	77.0	100.0	102.0	113.0	57.0
Human health and social work activities	17.0	21.0	24.0	25.0	27.0	28.0	33.0	14.0
Cultural, domestic and other services	68.0	69.0	74.0	82.0	88.0	94.0	106.0	60.0
Taxes less subsidies on products	131.0	127.0	122.0	115.0	117.0	122.0	148.0	75.0

Table A.2: GDP in Rwanda by Kind of Activity, 2011–14 (continued)

Items	2011		2012		2013		2014	
	First half	Second half	First half	Second half	First half	Second half	First half	Third quarter
Rwf billion, constant 2011 prices								
GDP	1,816.0	2,030.0	1,997.0	2,187.0	2,117.0	2,264.0	2,260.0	1,203.0
Agriculture, forestry and fishing	575.0	669.0	617.0	708.0	658.0	710.0	692.0	375.0
Food crops	390.0	454.0	430.0	476.0	458.0	480.0	484.0	256.0
Export crops	25.0	53.0	23.0	63.0	27.0	54.0	27.0	27.0
Livestock and livestock products	60.0	62.0	64.0	65.0	68.0	70.0	73.0	38.0
Forestry	91.0	93.0	94.0	97.0	98.0	99.0	100.0	50.0
Fishing	8.0	6.0	6.0	6.0	7.0	8.0	8.0	4.0
Industry	260.0	294.0	276.0	325.0	314.0	342.0	335.0	176.0
Mining & quarrying	34.0	40.0	32.0	36.0	39.0	43.0	44.0	25.0
Total manufacturing	93.0	112.0	100.0	116.0	105.0	121.0	112.0	58.0
Of which:								
Food	20.0	30.0	21.0	29.0	24.0	31.0	26.0	13.0
Beverages and tobacco	46.0	52.0	48.0	55.0	49.0	57.0	51.0	26.0
Electricity	5.0	6.0	6.0	6.0	7.0	8.0	8.0	4.0
Water & waste management	6.0	7.0	8.0	8.0	8.0	8.0	8.0	4.0
Construction	123.0	129.0	130.0	157.0	156.0	164.0	165.0	85.0
Services	856.0	934.0	973.0	1,023.0	1,022.0	1,081.0	1,108.0	586.0
Trade and services	274.0	318.0	322.0	358.0	341.0	379.0	377.0	200.0
Maintenance & repair of motor vehicles	10.0	10.0	10.0	10.0	10.0	10.0	10.0	6.0
Wholesale & retail trade	214.0	253.0	253.0	279.0	266.0	297.0	296.0	156.0
Transport	51.0	56.0	59.0	68.0	65.0	72.0	71.0	38.0
Other services	583.0	615.0	651.0	665.0	681.0	702.0	731.0	386.0
Hotels & restaurants	48.0	51.0	52.0	54.0	53.0	55.0	55.0	29.0
Information & communication	41.0	51.0	59.0	65.0	59.0	64.0	65.0	39.0
Financial services	54.0	53.0	60.0	61.0	68.0	66.0	70.0	31.0
Real estate activities	144.0	141.0	147.0	137.0	143.0	144.0	151.0	82.0
Professional, scientific & technical activities	48.0	49.0	53.0	51.0	53.0	54.0	55.0	27.0
Administrative & support service activities	50.0	52.0	54.0	55.0	56.0	57.0	59.0	30.0
Public administration and defense; compulsory social security	48.0	67.0	64.0	75.0	73.0	80.0	78.0	44.0
Education	62.0	62.0	66.0	66.0	68.0	68.0	74.0	37.0
Human health and social work activities	18.0	22.0	24.0	23.0	24.0	25.0	26.0	14.0
Cultural, domestic and other services	68.0	69.0	72.0	79.0	83.0	87.0	97.0	54.0
Taxes less subsidies on products	125.0	133.0	131.0	132.0	124.0	131.0	125.0	67.0

Source: NISR
December 2014

Table A.3: Inflation indicators in Rwanda, 2011–14
(year-on-year percent change)

Year/month	Overall	Core	Import prices	Energy prices	Food prices
2012					
January	7.8	7.1	7.9	8.4	12.7
February	7.9	6.0	6.0	5.8	15.5
March	8.2	5.3	4.9	8.3	15.5
April	6.9	4.8	3.8	6.9	12.8
May	8.3	5.4	3.1	10.8	15.1
June	5.9	3.7	2.6	6.6	11.3
July	5.6	3.0	2.6	8.8	10.4
August	5.8	2.5	1.2	5.4	12.6
September	5.6	2.1	1.2	2.8	13.7
October	5.4	2.5	2.7	5.5	12.1
November	4.5	2.8	2.9	5.9	9.8
December	3.9	2.5	3.2	5.7	7.9
2013					
January	5.7	4.7	3.0	5.6	8.3
February	4.8	5.1	4.0	8.5	4.7
March	3.2	4.8	3.4	4.6	1.9
April	4.4	5.2	4.0	6.4	4.1
May	3.0	3.6	3.5	2.5	2.6
June	3.7	3.4	1.9	0.9	4.4
July	3.5	3.6	1.5	-0.9	4.0
August	4.0	3.6	2.7	2.0	4.9
September	5.1	3.3	2.5	2.8	7.8
October	5.1	3.2	1.2	0.3	8.2
November	4.6	3.4	2.3	0.2	6.4
December	3.6	3.8	1.6	0.0	3.9
2014					
January	2.4	2.7	2.6	1.6	2.4
February	3.4	2.8	2.5	1.6	5.0
March	3.4	2.6	1.7	0.7	5.2
April	2.7	2.3	1.2	-0.5	3.8
May	1.9	2.3	0.9	-4.2	3.0
June	1.4	2.0	-0.4	0.2	1.9
July	1.9	2.3	0.8	2.2	2.4
August	0.9	2.5	1.1	0.8	-0.2
September	0.2	3.0	2.1	1.2	-3.1
October	0.5	3.5	3.2	0.8	-3.3
November	0.7	2.9	1.3	0.7	-2.7
December	2.1	2.9	1.6	2.0	0.7

Source: BNR and NISR

Table A.4: Average monthly rate of Rwandan franc versus seven currencies, 2011–14

Year/month	U.S. dollar	Euro	British pound	Uganda shilling	Kenya shilling	Tanzania shilling	Burundi franc
2012							
January	604.37	779.26	936.44	0.25	7.11	0.39	0.47
February	605.15	799.47	955.36	0.26	7.40	0.39	0.47
March	606.75	801.24	959.52	0.25	7.44	0.39	0.47
April	607.01	799.45	971.24	0.25	7.40	0.39	0.46
May	608.58	780.82	970.12	0.25	7.33	0.39	0.45
June	609.94	764.00	947.89	0.25	7.30	0.39	0.44
July	612.95	752.14	955.23	0.25	7.40	0.39	0.44
August	613.60	759.79	963.57	0.25	7.43	0.40	0.43
September	618.22	794.17	995.03	0.25	7.43	0.40	0.43
October	625.24	810.86	1,006.08	0.25	7.47	0.40	0.43
November	628.77	806.64	1,003.95	0.24	7.46	0.40	0.43
December	630.99	827.21	1,018.50	0.24	7.46	0.40	0.42
2013							
January	631.29	838.05	1,008.81	0.24	7.38	0.40	0.42
February	633.25	846.82	981.39	0.24	7.36	0.40	0.41
March	634.98	824.27	957.00	0.24	7.52	0.40	0.41
April	637.38	829.03	974.68	0.25	7.69	0.40	0.41
May	640.13	831.41	979.34	0.25	7.73	0.40	0.41
June	641.66	846.19	993.12	0.25	7.61	0.40	0.42
July	645.22	843.25	980.34	0.25	7.55	0.41	0.42
August	649.01	864.16	1,005.03	0.25	7.53	0.41	0.43
September	653.26	871.37	1,033.65	0.26	7.60	0.41	0.43
October	661.29	901.19	1,064.45	0.26	7.88	0.42	0.43
November	664.30	897.29	1,068.75	0.27	7.84	0.42	0.43
December	667.74	914.43	1,093.43	0.27	7.85	0.43	0.44
2014							
January	672.66	916.57	1,107.13	0.27	7.91	0.43	0.44
February	674.65	920.46	1,115.73	0.28	7.95	0.42	0.44
March	676.39	935.04	1,124.54	0.27	7.95	0.42	0.44
April	678.20	936.67	1,135.18	0.27	7.90	0.42	0.44
May	680.67	935.68	1,146.96	0.27	7.79	0.41	0.44
June	681.69	927.85	1,151.55	0.27	7.79	0.41	0.44
July	683.47	926.05	1,168.56	0.26	7.76	0.41	0.44
August	684.23	911.52	1,143.32	0.26	7.76	0.41	0.44
September	685.48	884.88	1,118.46	0.26	7.71	0.41	0.44
October	688.68	873.83	1,107.96	0.26	7.72	0.41	0.44
November	690.33	861.13	1,090.39	0.25	7.68	0.40	0.45
December	692.56	854.74	1,083.04	0.25	7.66	0.40	0.45

Source: BNR

Table A.5: Key monthly interest rates in Rwanda, 2011–14
(percent)

Year/month	Policy Rate	Average deposit rate	Average lending rate	Interbank rate	Treasury bill rate				
					28 days	91 days	182 days	364 days	Weighted average rate
2012									
January	7.0	7.4	17.0	7.3	7.1	7.3	7.7	8.4	7.6
February	7.0	8.3	16.3	6.9	7.1	7.6	7.4	8.0	7.6
March	7.0	8.2	16.3	7.7	7.4	7.6	7.9	7.8	7.7
April	7.0	8.1	16.9	8.0	7.5	7.6	7.9	8.5	7.9
May	7.5	9.9	16.7	8.6	7.9	8.1	8.3	8.9	8.3
June	7.5	7.9	16.8	9.0	8.8	9.6	9.4	9.1	9.3
July	7.5	8.9	16.5	9.1	9.4	10.2	..	..	9.8
August	7.5	8.6	17.1	9.5	10.6	10.2	10.5	11.7	11.1
September	7.5	8.5	17.1	10.8	11.5	12.1	12.0	12.7	12.3
October	7.5	9.2	16.6	10.9	11.9	12.4	12.5	..	12.1
November	7.5	11.2	16.7	11.9	11.8	12.5	12.7	..	12.4
December	7.5	10.7	16.5	11.1	11.8	12.6	12.8	..	12.4
2013									
January	7.5	11.3	17.1	11.1	12.1	12.6	12.8	..	12.4
February	7.5	10.3	17.0	10.4	11.6	12.3	12.7	..	12.2
March	7.5	10.4	17.2	10.0	11.0	12.1	12.6	12.8	12.1
April	7.5	10.7	17.3	10.9	11.2	12.3	12.8	13.0	12.0
May	7.5	10.6	17.6	11.1	11.0	12.0	12.4	12.7	12.0
June	7.0	10.6	17.7	9.6	10.0	10.7	11.3	11.7	10.8
July	7.0	8.5	17.2	9.6	8.9	9.6	10.0	10.7	9.7
August	7.0	10.5	17.5	7.6	7.8	8.3	8.9	9.3	8.6
September	7.0	9.0	17.8	7.0	6.8	6.9	7.3	7.8	7.1
October	7.0	9.5	17.4	6.7	6.2	6.5	6.7	7.6	6.8
November	7.0	8.0	17.2	6.1	5.5	5.9	6.2	7.0	6.1
December	7.0	8.5	16.9	5.6	5.0	5.3	5.9	6.4	5.6
2014									
January	7.0	8.9	17.5	5.6	5.4	6.0	6.7	8.2	6.4
February	7.0	8.0	17.1	5.8	5.1	5.8	6.5	8.1	6.1
March	7.0	8.3	16.8	5.8	4.9	5.5	6.6	8.0	6.0
April	7.0	8.0	17.4	5.6	4.8	5.3	6.3	7.8	6.0
May	7.0	9.3	17.2	5.7	4.5	5.3	6.3	7.4	5.9
June	6.5	8.6	17.5	5.7	4.3	5.0	5.7	6.6	5.6
July	6.5	8.4	17.2	5.5	4.0	4.5	5.2	6.5	5.5
August	6.5	8.8	17.4	5.5	4.1	4.4	5.0	6.3	5.2
September	6.5	7.3	17.1	5.6	4.2	4.5	5.2	6.5	5.5
October	6.5	7.3	17.5	5.7	4.2	4.6	5.2	6.4	5.3
November	6.5	8.2	16.7	5.7	3.9	4.4	5.0	6.3	5.1
December	6.5	7.8	17.7	4.7	3.7	4.1	5.0	6.2	4.9

Source: BNR.

Note: ".." indicates that data is not available.

Table A.6: Rwanda's gross international reserves, 2011–14

Year/month	Rwf billion	US\$ million
2012		
January	596.7	986.8
February	581.5	960.0
March	545.6	899.1
April	514.1	845.4
May	464.4	762.2
June	526.3	859.4
July	472.9	771.3
August	450.7	733.4
September	449.0	721.0
October	470.6	750.4
November	476.9	757.4
December	535.5	850.3
2013		
January	465.2	735.8
February	436.5	688.3
March	443.6	697.7
April	451.7	706.9
May	623.6	972.9
June	653.0	1,016.1
July	659.3	1,017.5
August	657.4	1,011.7
September	680.8	1,035.5
October	691.3	1,044.8
November	682.9	1,024.4
December	717.0	1,070.0
2014		
January	679.7	1,008.1
February	648.2	959.8
March	632.3	932.7
April	630.3	927.5
May	656.4	963.2
June	646.0	946.5
July	629.0	919.6
August	617.9	902.8
September	604.3	879.7
October	562.4	815.7
November	567.6	820.9

Source: BNR and World Bank staff calculation



Table A.7: Rwanda—tourism sector data, 2012–14

Year	Year/ month	Leisure	Visiting Friends & Relatives	Business & Confer- ence	Transit/ other	Total	Volcanoes	Akagera	Nyungwe	Total
2012	January	8,126	28,711	27,977	15,794	80,608	2,738	2,186	646	5,570
	February	8,775	19,956	33,441	18,481	80,653	2,516	1,856	739	5,111
	March	7,848	21,236	33,684	18,413	81,181	1,945	1,315	457	3,717
	April	5,890	22,691	33,828	16,554	78,963	1,443	1,269	448	3,160
	May	5,167	23,405	40,168	17,569	86,309	1,627	1,492	357	3,476
	June	7,364	23,697	29,491	19,104	79,656	2,690	2,384	544	5,618
	July	9,663	25,186	36,097	22,034	92,980	3,149	3,457	1,001	7,607
	August	10,693	33,299	34,014	22,242	100,248	3,219	2,984	1,014	7,217
	September	10,102	25,112	32,532	19,878	87,623	2,843	1,786	603	5,232
	October	8,961	25,105	35,042	22,869	91,978	2,906	1,443	725	5,074
	November	5,810	27,292	45,012	30,102	108,215	1,583	2,605	441	4,629
	December	9,403	33,096	39,663	25,214	107,376	1,824	2,423	646	4,893
	Total	97,802	308,786	420,949	248,254	1,075,790	28,483	25,200	7,621	61,304
2013	January	8,934	29,762	39,935	23,532	102,163	1,901	2,061	672	4,634
	February	8,975	21,977	40,240	20,721	91,913	2,002	2,032	686	4,720
	March	7,402	23,797	43,085	24,375	98,659	1,927	2,126	641	4,694
	April	6,747	30,593	35,003	17,367	89,710	862	1,235	338	2,435
	May	7,923	25,648	36,875	17,148	87,594	1,151	2,024	391	3,566
	June	9,342	26,397	32,436	16,515	84,690	2,379	2,756	581	5,716
	July	9,584	30,170	43,370	12,500	95,624	3,208	3,673	820	7,701
	August	12,033	32,274	31,295	18,269	93,871	3,346	3,345	700	7,391
	September	7,862	25,998	29,906	16,248	80,014	3,004	2,845	604	6,453
	October	8,166	26,936	30,645	35,224	100,971	2,047	2,910	439	5,396
	November	7,794	29,772	32,671	39,997	110,234	1,510	1,844	394	3,748
	December	11,975	28,294	29,513	32,211	101,993	1,862	2,836	636	5,334
	Total	106,737	331,618	424,974	274,107	1,137,436	25,199	29,687	6,902	61,788
2014	January	6,650	34,396	36,304	22,221	99,571	2,167	2,108	737	5,012
	February	9,306	31,803	37,178	25,949	104,236	2,080	1,960	637	4,677
	March	8,251	32,476	33,324	27,894	101,945	1,892	2,204	640	4,736
	April	6,294	23,997	28,775	24,929	83,995	1,365	1,453	704	3,522
	May	6,907	27,024	33,499	26,562	93,992	1,399	2,575	778	4,752
	June	9,314	32,092	36,895	26,570	104,871	2,664	2,847	918	6,429
	July	..	..	..	..	..	3,426	3,294	1219	7,939
	August	..	..	..	..	..	3,438	3,879	1007	8,324
	September	..	..	..	..	..	3,246	1,894	677	5,817
	Total	46,722	181,788	205,975	154,125	588,610	21,677	22,214	7,317	51,208

Source: Rwanda Development Board.

Note: ".." indicates that data is not available.

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