SOUTHMOD
Country report

Rwanda

RWAMOD v1.1
2017–2023

Antoine de Mahieu, Jeannette Mukangango, Theogene Harerimana, Jesse Lastunen, Naphtal Hakizimana, John Karangwa, Aimable Nsabimana, Michael Noble, and Gemma Wright

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Corresponding author: Antoine de Mahieu, antoine_de_mahieu_91@hotmail.com

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About the project

SOUTHMOD – simulating tax and benefit policies for development

SOUTHMOD is a joint project between the United Nations University World Institute for Development Economics Research (UNU-WIDER), Southern African Social Policy Research Insights (SASPRI), and the International Inequalities Institute at the London School of Economics and Political Science (LSE) in which tax-benefit microsimulation models for selected developing countries are being built. These models enable researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each country.

SOUTHMOD models are currently available for Bolivia (BOLMOD), Colombia (COLMOD), Ecuador (ECUAMOD), Ethiopia (ETMOD), Ghana (GHAMOD), Mozambique (MOZMOD), Peru (PERUMOD), Rwanda (RWAMOD), Mainland Tanzania (TAZMOD), Uganda (UGAMOD), Viet Nam (VNMOD), Zambia (MicroZAMOD), and Zanzibar (ZANMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents RWAMOD, the SOUTHMOD model developed for Rwanda. This work was carried out by UNU-WIDER, SASPRI, and the Rwanda Revenue Authority (RRA).

The results presented in this report are derived using RWAMOD version 1.1, which is part of the SOUTHMOD bundle (SOUTHMOD_A2.0) and runs on EUROMOD software. The report describes the different tax-benefit policies in place, how the microsimulation model picks up these different provisions, and the database on which the model runs. It concludes with a validation of results against external data sources for Rwanda. For further information on access to RWAMOD and other SOUTHMOD models, see the SOUTHMOD page, SOUTHMOD Modelling Conventions, and SOUTHMOD User Manual (UNU-WIDER 2024a; 2024b).

The RWAMOD model and its documentation in this country report has been prepared within the UNU-WIDER project SOUTHMOD – simulating tax and benefit policies for development (Phase 3), which is part of the Domestic Revenue Mobilization programme Phase II. The programme is financed through specific contributions by the Norwegian Agency for Development Cooperation (Norad).

Information and requests: publications@wider.unu.edu
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Acronyms

AFI	Alliance for Financial Inclusion
BRN	National Bank of Rwanda
CBHI	Community-Based Health Insurance
CIT	Corporate income tax
CPI	Consumer Price Index
EACMA	East African Community Customs Act
EICV	Integrated Household Living Conditions Survey
FARG	Genocide Survivors Support and Assistance Fund
HGSF	Home Grown School Feeding
IDP	Integrated Development Programme
ILO	International Labour Organization
LODA	Local Administrative Entities Development Agency
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MMI	Military Medical Insurance
NECDP	National Early Childhood Coordination Programme
NISR	National Institute of Statistics of Rwanda
PAYE	Pay-as-you-earn
PIT	Personal income tax
PPI	Producer Price Index
RAB	Rwanda Agriculture Board
RAMA	Rwandaise d'Assurance Maladie, Rwanda Medical Insurance Scheme
RDRC	Rwanda Demobilization and Reintegration Commission
RDRP	Rwanda Demobilization and Reintegration Programme
RRA	Rwanda Revenue Authority
RSSB	Rwanda Social Security Board
RWF	The Rwandan franc
SACCO	Savings and Credit Cooperative Organization
SME	Small or medium-sized enterprise
SSA	Social Security Administration, United States
SSFR	Social Security Fund of Rwanda
tCO_2e	Tons of carbon dioxide equivalent
UNICEF	United Nations Children's Fund
UNU-WIDER	United Nations University World Institute for Development Economics Research
USD	United States dollar
VAT	Value-added tax
VUP	Vision 2020 Umurenge Programme
WFP	World Food Programme

1 General information

1.1 Country context

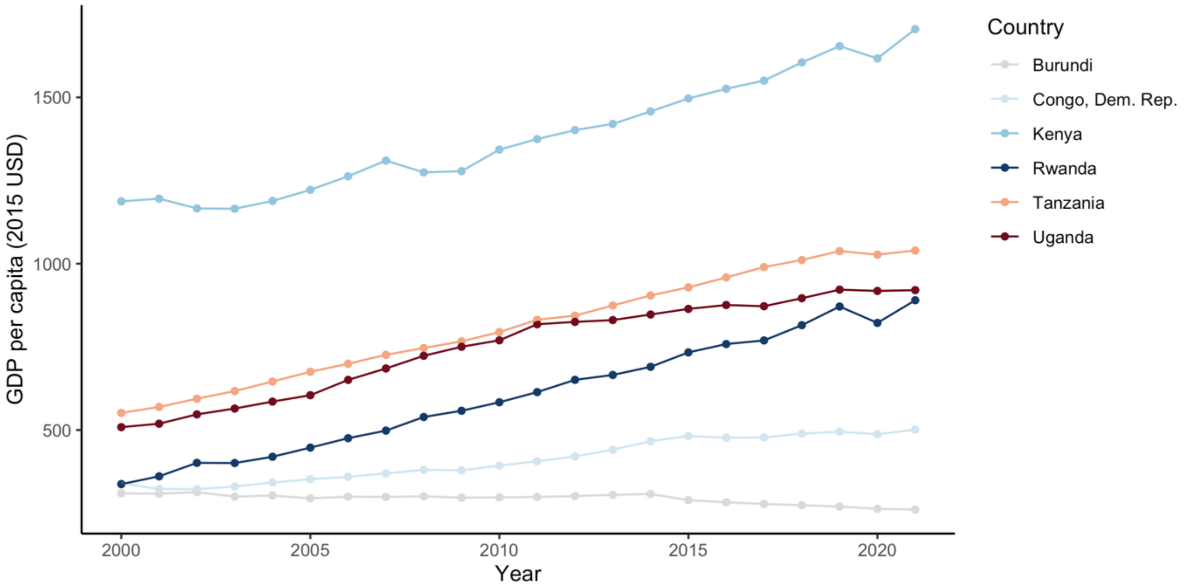
Rwanda is a landlocked country located in East Africa and bordered by Burundi, Uganda, Tanzania, and the Democratic Republic of the Congo. The population is about 14.1 million people (Worldometers 2023), who are living on 26,338 km2 (10,169 square miles) of land, which makes it one of the most densely populated countries in Africa. Around one million people live in Kigali, Rwanda’s capital and largest city. The country’s population is expected to reach 16.2 million in 2030 and 22.9 million in 2050, according to the medium projections of the United Nations (United Nations 2022).

Rwanda's economy suffered heavily in the wake of the 1994 genocide but has since strengthened. Its nominal GDP reached 11,976 billion Rwandan francs (RWF) in fiscal year 2021/22 (nearly 12 billion U.S. dollars). The average real growth rate of the economy over the past five years was 6.4 per cent (BNR 2022), and the real GDP per capita was multiplied by more than 2.6 since the beginning of the century, which is considerably more than neighbour countries, as can be observed on Figure 1.1.

The economy is based mostly on agriculture, accounting for 23 per cent of GDP, of which a large share is subsistence farming. Coffee and tea are the major cash crops for export. The industrial sector contributes to 21 per cent of the GDP. Agricultural products, along with beverages and tobacco, represent a large share of the manufactured goods. Rwanda's mining industry is also an important contributor to the industrial sector. Minerals mined include cassiterite, wolframite, gold, and coltan, which is used in the manufacture of electronic and communication devices. Rwanda's service sector accounts for 48 per cent of the country's GDP. Major tertiary contributors include banking and finance, wholesale and retail trade, hotels and restaurants, transport, storage, communication, insurance, real estate, business services and public administration, including education and health (BNR 2022).

The main exports in trade value in 2021 were gold, refined petroleum, and tin ores, which respectively account for 23, 7, and 6 per cent of the total exported trade value. The share of gold has been decreasing in the export mix, while the shares of refined petroleum and tin ores have increased. Rwanda’s exports flow predominantly to the Democratic Republic of the Congo (DRC) and the United Arab Emirates, which represent 37 and 28 per cent of the destination market, respectively. Imports on the contrary are very diversified. The main categories of imported goods were electrical machinery and electronics, mineral fuels and oils, and gold, accounting for 12, 10, and 8 per cent of imports, respectively. Seventeen per cent of imported goods come from China, 12 from Kenya, and 9 from United Arab Emirates (OEC 2022). The data suggests that Rwanda is an important transit country for gold and refined petroleum, as those products are imported and exported in large quantities. In fiscal year 2021/2022, the trade deficit attained the record value of RWF 1,955 billion, around 16.3 per cent of GDP (BNR 2022). This trade deficit deterioration is due mainly to the increase in importation value of energy products, following increases in both price per unit and volumes.

Figure 1.1: GDP per capita in Rwanda and neighbouring countries, 2000–21



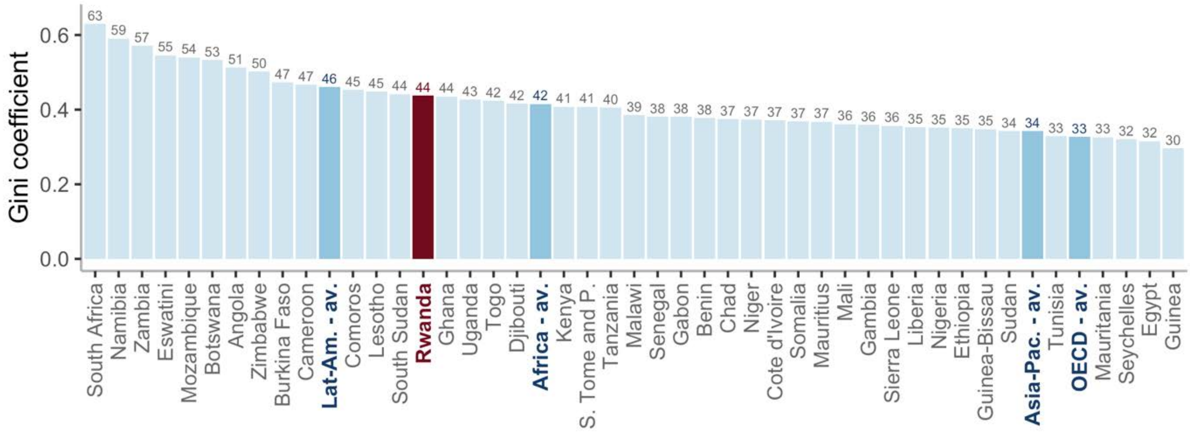
Source: Authors' construction based on World Bank national accounts data and OECD National Accounts data files. Under Creative Commons BY 4.0 license. Available at https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.

At large, Rwanda's economic prospects are mixed. On one hand the country faces large and persistent budget and current account deficits, while on the other hand the country is characterized by strong governance relative to its peers, a record of stable macro performance, high medium-term growth potential, and concessional public sector debt (Fitch 2023).

Climate change is a threat to Rwanda's economy, engendering severe droughts in the east and southeast of the country, along with shorter and more intense rain seasons in the west and northwest, causing floods and landslides and affecting agricultural production. Under a 'business as usual' projection, Rwanda's total emissions are predicted to more than double over the 2015–30 period, rising from 5.3 million tons of carbon dioxide equivalent (tCO_2e) in the base year to 12.1 million in 2030. The expected increase in emissions is mainly due to the growing use of fossil fuels, arising from increasing demand for power generation and road transport. According to the last climate action plan and conditionally on receiving international support and funding, Rwanda aims at limiting the emissions at 7.5 million tCO_2e by 2030. This would represent an increase of 42 per cent since 2015, instead of the 128 per cent in the 'business as usual' scenario (MoE 2022). Mitigation measures include the deployment of hydro and solar energy, improving energy efficiency in industrial processes, introducing vehicle emission standards, rolling out electric vehicles, and promoting on-farm biogas use.

Consumption-based poverty rates, as calculated based on national household surveys and a methodology developed by the National Institute of Statistics of Rwanda (NISR), have decreased over time. Poverty was measured at 44.8 per cent in 2011, 38.1 per cent in 2014, and 36.7 per cent in 2017. The Gini coefficient of inequality, derived using real consumption per adult equivalent, has been however relatively stable over the past decade, at 43.8 in 2011, 42.2 in 2014, and 43.1 in 2017 (NISR 2018). As can be seen on Figure 1.2, the level of inequality is relatively high in Rwanda. It is above the African average of 41.5, and significantly above the OECD average of 32.7. No up-to-date data on poverty and inequality are however available, as no household survey was completed since the last Integrated Household Living Conditions Survey (EICV) wave in 2016/2017 (EICV5).[1]

Figure 1.2: Gini coefficient



Note: Latest available Gini coefficients are shown. Only countries which had a Gini coefficient available after 2013 are included. The 'Lat-Am' (Latin American) average also includes the Caribbean.

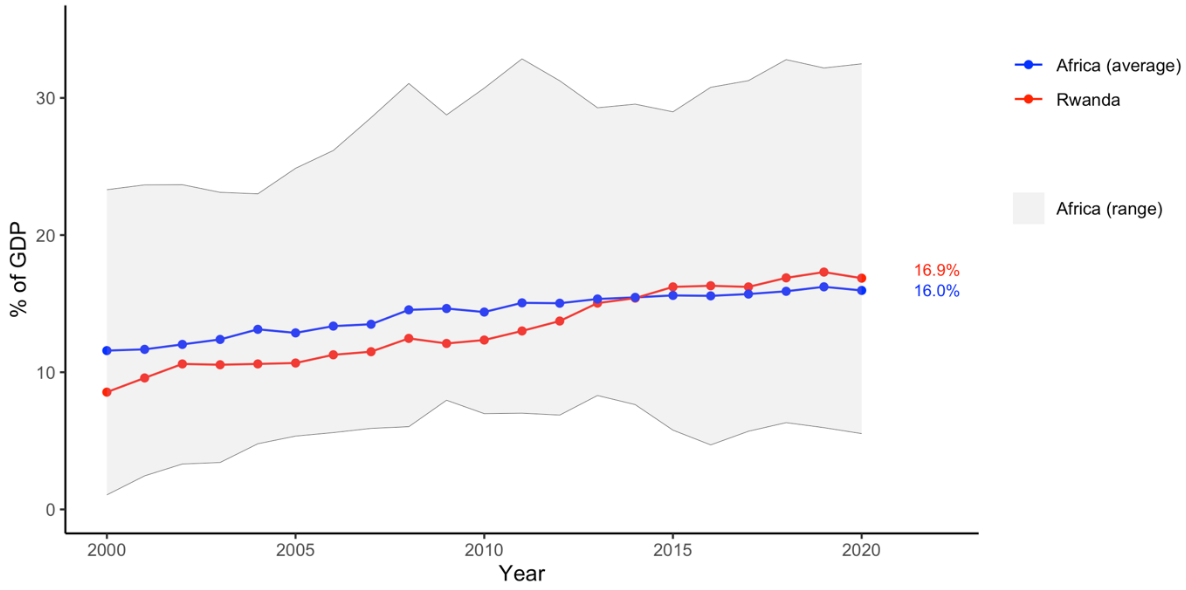
Source: Authors' construction based on official data collected by Our World in Data. Under Creative Commons BY 4.0 license. Available at: https://ourworldindata.org/grapher/economic-inequality-gini-index.

1.2 Public revenues and expenses

The Rwandan government had annual revenues of RWF 2,390 billion in 2020, which is around 24.5 per cent of GDP. Tax revenues, measured as a percentage of GDP, have increased steadily over time, reaching 16.9 per cent in 2020, while they were only at 8.5 per cent in 2000, and constitute 68.7 per cent of the government revenues. Rwanda's tax revenues were below the African average until 2013 and are now slightly above, as can be seen in Figure 1.3. The increase over the last decades is mainly due to the personal income tax revenues, which increased from less than 0.8 per cent of GDP in 2000 to 3.7 per cent in 2020. This strong increase was largely due to bracket creep (brackets were not uprated with inflation between 2005 and 2023), better tax collection, and a formalizing economy. Value-added tax (VAT) revenues also increased significantly, from 1.7 per cent of GDP in 2000 to 5.0 per cent in 2020. Corporate income tax (CIT) revenues increased from 1.4 per cent in 2000 to 3.2 per cent in 2020. Besides taxes, government revenues come mainly from grants (20 per cent of the revenues), borrowing, and other sources.

[1] **EICV6 was not representative as it had to be stopped due to the COVID-19 pandemic. EICV7 will be collected from October 2023 to October 2024, with the first results likely available around May 2025.**

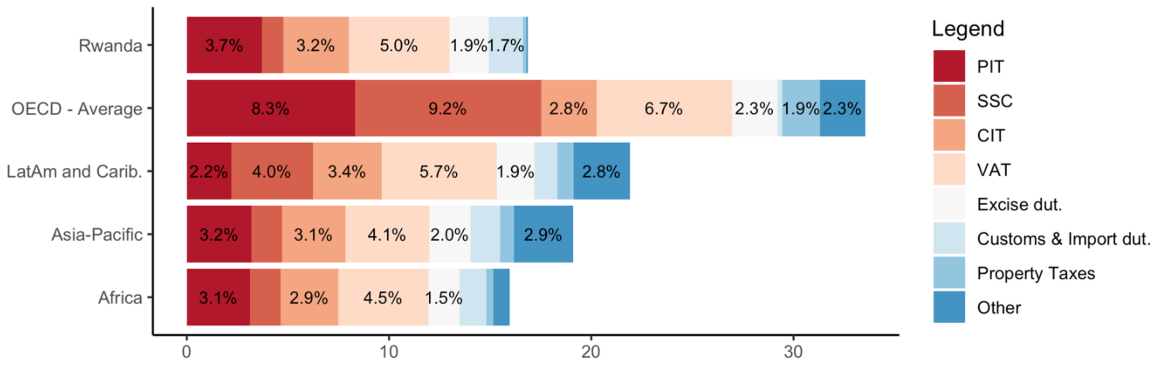
Figure 1.3: Tax-to-GDP ratio over time, 2000–20



Source: Authors' construction based on data from OECD's Global Revenue Statistics Database. Available at: https://www.oecd.org/tax/tax-policy/global-revenue-statistics-database.htm.

As can be seen from Figure 1.4, Rwanda has a tax mix that is similar to the African average: VAT is the largest source of tax revenues, followed by personal income taxes. Rwanda has very low revenues from property taxes and social security contributions compared to OECD countries. This indicates that there might be room for an increase in those taxes and contributions. Those are usually progressive as they concern respectively capital owners and formal workers, which are over-represented in the higher income and consumption deciles.

Figure 1.4: Tax revenue by source (% of GDP)



Source: Authors' construction based on data from OECD's Global Revenue Statistics Database. Available at: https://www.oecd.org/tax/tax-policy/global-revenue-statistics-database.htm.

For several consecutive years, government expenditures have exceeded revenues, leading to escalating budget deficits and an increasing burden on the public debt. The budget deficit reached 13 per cent of GDP in fiscal year 2019/20,[2] having increased steadily from 3.5 per cent in 2015/16 (BNR 2021, 2022). The exceptionally large annual deficits in recent years are largely due to the COVID-19 pandemic. The

[2] No 2020/2021 nor 2021/2022 budget deficit estimate was provided in the 2021/2022 NBR Annual Report.

deficit is expected to decrease to 5.3 per cent of GDP by fiscal year 2023/24, along with a predicted government debt-to-GDP ratio of 71 per cent (Fitch 2023).

1.3 The tax-benefit system

1.3.1 Social benefits

1.3.1.1 Non-contributory benefits

Ubudehe system

A number of non-contributory benefits aim at reducing poverty and increasing the economic activity of economically vulnerable households. Eligibility to those benefits is, among other factors, based on so-called 'Ubudehe' categories, which have been used since 2001 to divide households into clusters based on their wealth and labour capacity. The system initially divided households into six wealth categories, which were reduced to four in 2016. The categories that prevail since 2016 can be found in Table 1.1.

Table 1.1: Ubudehe categories, 2016 system

#	General description	Household criteria	Eligibility for transfers	Share of households, 2015 (%)
1	Very poor and vulnerable citizens who are homeless and cannot afford basic necessities without assistance	Without a house or ability to rent a house; often struggles to obtain food and basic items	Eligible for VUP Direct Support (if not a worker), VUP Public Works, Mutuelle de Santé benefits, FARG support, Girinka and micro-loans	16.0
2	Those who have a dwelling or can rent one but are not gainfully employed and can only afford to eat once or twice a day	Owns a house or is able to rent a house; often has access to food and works for wages; or with a household member who is employed in a non-permanent job	Eligible for VUP Public Works and FARG support, Girinka and micro-loans	29.8
3	Those who have a job, and farmers who go beyond subsistence farming to produce, and can provide employment to dozens of people	With a household member who is an employee in the public or private sector; self-employed; has business activities; farmer with a surplus to sell at a market; or small trader	Eligible for micro-loans	53.7
4	Those who own a large-scale business, individuals working with international organizations and industries, and public servants	With a household member who is a large trader; owns a company providing specialized services; employed in the public or private sector at a high level; has an industry or industries; owns a rental house or houses in big cities, or other large businesses		0.5

Source: Authors' summary of information from Rwandapedia (2021a); AFI (2019); Kidd and Kabare (2019).

Ubudehe is implemented and monitored by administrative entities at the village level. The Ministry of Local Government (MINALOC) and the Local Administrative Entities Development Agency (LODA) are however responsible for overseeing its implementation through working with village leaders. In the beginning of the financial year, once every three years, the participating villages come together over a period of four to seven days to complete the Ubudehe process. The village meetings are chaired by the president of the local Ubudehe Committee and the village leader.

The steps of the Ubudehe process include (i) determining the profile of a household in poverty, judged by the participants, (ii) identifying the causes and consequences of poverty, and (iii) classifying household heads into the different categories. Note that, with observed changes in peoples' wellbeing, a household's Ubudehe status may be updated more frequently than in every three years by local authority offices (Rwandapedia 2021a).

The Ubudehe classification system is being reformed at the time of writing. A new grading system was announced in June 2020, with a nationwide exercise to re-classify households into new categories launched by LODA in October 2020 (The New Times 2020a). The new system includes five categories, represented by letters A, B, C, D, and E, with details on the classification available in Table 1.2. The stated goals of the re-classification include clarifying the eligibility criteria, codifying the related guidelines, and ensuring that malpractices are avoided. The 2016 system tied services such as university scholarships and medical services to Ubudehe categories; under the new system, this will not be the case anymore.

Table 1.2: Proposed Ubudehe categories

Category	Description	Income and occupation limits	Land and farming
A	Well-off households	Households with an aggregated income of more than RWF 600,000 per month	Households with more than 10 hectares of land in rural areas; more than 1 hectare plot in urban centers; or those carrying out livestock farming activities that enable them to obtain RWF 600,000 per month
B		Households with an aggregated income between RWF 65,000 and RWF 600,000 per month	Between 1 and 10 hectares of land in rural areas; between 300 square meters and 1 hectare in cities
C		Households with an aggregated income of between RWF 45,000 and RWF 65,000 per month	Between 0.5 and 1 hectare in rural areas; between 100 and 300 square meters in urban areas
D		Households with an aggregated income of less than RWF 45,000 a month (casual workers)	Less than half a hectare in rural areas; less than 100 square meters in urban areas
E (special)	Vulnerable households	People not in the labour force as a result of age, major disabilities, or incurable diseases	No ownership of assets or other sources of livelihood

Source: Authors' illustration based on information from The New Times (2021a).

The date of December 2021 has been mentioned by several persons in charge of community development and social affairs (The New Times 2021a) for the introduction of the new categories. More recently, it was announced that beneficiary selection to non-contributory benefits will in the future be done through a social registry dubbed the 'Imibereho Social Registry System' instead of the Ubudehe categories (The New Times 2023a, 2023b). As no detailed information on the new system is available at the time of writing, it is not described here.

Benefit 1: *Vision 2020 Umurenge (VUP)*

The Vision 2020 Umurenge Programme (VUP) was introduced in 2008, drawing much of its inspiration from Ethiopia's Productive Safety Net Programme and Food Security Programme (Siegel et al. 2011; Lavers 2016). VUP includes (i) a public works programme for very poor households who are able to work, (ii) direct support through regular cash transfers to very poor households with no labour capacity, and (iii) a microcredit scheme to provide loans and promote financial literacy.

i. *Public Works:* Extremely poor households (Ubudehe categories 1 or 2) with able-bodied members above 18 years of age are eligible to the public works component. Participation is however sometimes restricted due to practical reasons, such as geography and access to transport (Gatzinsi et al. 2019). The public works wages are determined by district councils depending on the standard of living in that district. In 2021, the minimum daily wage for VUP public works ranged from RWF 1,000 to 2,000 in districts outside Kigali, while it was at RWF 2,500 in the capital. According to The New Times (2021b), the LODA considered increasing daily wages in December 2021 due to rapid increases in prices.

ii. Besides the classic Public Works programme (cPW) described above, there is also an expanded Public Works programme (ePW). The expanded programme provides a regular monthly income for households in Ubudehe category 1, with only one household member regarded as eligible to work but who also has care responsibilities. The programme was conceptualized in fiscal year 2015/16, and actual implementation commenced in 30 districts in 2016/17. The ePW started at a small scale, targeting one sector per district, and was then rapidly scaled up. In 2017/18, the expanded programme was implemented in 80 sectors across the districts (World Bank 2019). Participants receive a monthly wage of RWF 10,000 for 12 months of the year, and project outputs are usually achieved on an equivalent of 12 hours of work per week (LODA 2019).

iii. *Direct Support:* Labour-constrained households in Ubudehe category 1 are eligible for direct support. A household is labour-constrained if it does not include any workers (individuals aged 18–64 who are able-bodied and not studying) or, since 2018/19, if it has only one worker who is also caring for someone with severe disabilities or chronic illness (LODA 2018). The level of benefits ranges from RWF 7,500 per month for one-person households to RWF 21,000 for households with five or more members.

iv. *Microcredit:* Households in Ubudehe categories 1,2, or 3[3] can apply for individual or group/cooperative loans from the VUP's financial services component, which is complemented by training on financial management, saving and credit (LODA 2015). In the new scheme that started in 2015, the annual interest rate is of 11 per cent. Before 2015, the rate was of 2 per cent per year (AFI 2019).

v. The number of participants in different VUP programmes between 2014/15 and 2020/21 are shown in Table 1.3. The cost of the programme in 2017/18 was approximately RWF 26.4 billion (World Bank 2019). Despite the significant expansion of the VUP, coverage remains low compared to needs according to MINALOC (2020). The exclusion of extremely poor and constrained households from VUP Public Works (particularly female-headed households caring for young children or people with disabilities) has also been identified as a long-standing challenge by the government.

Table 1.3: Participants in VUP programmes

Fiscal year	Households receiving VUP Direct Support	Workers involved in VUP Classic Public Works	Workers involved in VUP Expanded Public Works
2014/2015	84,345	111,923	-
2015/2016	85,899	103,584	-
2016/2017	95,906	128,656	2,757
2017/2018	94,912	124,993	13,003
2018/2019	108,496	142,851	29,768
2019/2020	119,025	171,693	42,052
2020/2021	119,798	168,849	58,393
2021/2022	123,015	109,217	100,136

Source: Authors' construction based on data from Local Administrative Entities Development Agency Annual Reports (2015–22).

Benefit 2: *Girinka*

The Girinka ('one-cow per family') programme, which started in 2006, aims to ensure that each household in poverty has a cow, with the goal of reducing child malnutrition and increasing the

[3] Individuals in Category 4 can also apply for a micro loan provided that they do so as part of a group that includes Ubudehe Categories 1 and 2 households (AFI 2019).

incomes of poor farmers. The scheme is managed by the Rwanda Agriculture Board (RAB) of the Ministry of Agriculture (MINAGRI) and also mainly funded by MINAGRI. As for eligibility, beneficiary households must not already own a cow, must have constructed a cowshed, have at least 0.25–0.75 hectares of land (some of which must be planted for fodder), be in Ubudehe categories 1 or 2, have a household member who is considered a person of integrity by the community, and have no other sources of income. Beneficiaries who do not have enough land individually may join with others in the community to build a common cowshed. Priority is given to female-headed households.

The cows that are distributed are purchased locally, preferably from former Girinka beneficiaries whose originally granted cows have calved more than once. The scheme also includes a training programme that offers workshops and the provision of supplies to assist farmers in caring for their cow (Rwandapedia 2021b; Cirillo and Tebaldi 2016). The yearly number of cows distributed was of 20,800 in fiscal year 2021/22. As of 2022, more than 427,000 families had received a cow under the programme (MINAGRI 2022). In August 2023, it was stated by the ministry of agriculture that, to eradicate malpractices, the identification of beneficiaries will no longer be based on Ubudehe categories, but by the new social registry system (The New Times 2023c).

Benefit 3: *Rwanda Demobilization and Reintegration Programme*

The Rwanda Demobilization and Reintegration Commission (RDRC) was set up in 1997[4] with the objective of demobilizing former combatants from the Rwanda Defence Forces and other armed groups by supporting their transition and reinsertion into civilian life. The commission especially targets those in a state of vulnerability, which is assessed based on several criteria, such as access to housing and productive means, health, employment situation, and household characteristics.

The RDRC's Rwanda Demobilization and Reintegration Programme (RDRP) includes four types of benefits: The Basic Needs Kit (BNK), Recognition of Service Allowance (RSA), Reintegration Grant (RG) and Vulnerable Support Window (VSW) grant. The BNK, RSA and RG are one-off benefits that aim at easing the initial steps of the demobilized ex-combatant into civilian life.

The BNK is a cash transfer worth RWF60,000 per beneficiary, which includes dependents of those previously in armed group forces. The RSA is paid out in two installments. The first instalment (RWF50,000) is paid one month after settlement. The second instalment is paid two months later. It is staggered based on the rank of the demobilized combatant, ranging from RWF120,000 for a private to 600,000 for a colonel (Cirillo and Tebaldi 2016). The RG, worth RWF120,000, is paid three months after demobilization. The VSW aims to support ex-combatants who remain vulnerable despite the above-mentioned cash transfers, and includes vocational skills training, formal education, and selected income-generating activities. The RDRC also provides more tailored medical treatment and monthly support to disabled ex-combatants.

About 8,357 combatants, 343 child soldiers and 9,921 dependents were repatriated and demobilized between January 2009 and June 2020 through the programme. In fiscal year 2019/20, 68 new ex-combatants were included in the programme (RDRC 2021). According to the 2020 Implementation Plan by MINALOC (2020), RDRC direct support is expected to reach 3,500 extremely poor households with no labour per year between 2018/19 and 2023/24. The overall budgetary cost of the programme has been relatively stable over the years, oscillating between RWF4–6 billion annually based on the national budgets from the Ministry of Finance and Planning (MINECOFIN 2021a).

[4] The RDRC was established by Presidential Decree No. 37/01 of 09/04/2002. The presidential Decree has been repealed by Law No.º50/2015 of 14/12/2015 establishing Rwanda Demobilization and Reintegration Commission and determining its responsibilities, organization and functioning.

Benefit 4: *Genocide Survivors Support and Assistance Fund*

Genocide Survivors Support and Assistance Fund (FARG) was established in 1998.[5] The aim of the fund is to assist the neediest genocide survivors, especially orphans, elderly people and adults with disabilities. FARG support includes a direct cash transfer component as well as educational scholarships, support to mutual health insurance payments, shelter development and rehabilitation and promotes income-generating projects.

The number of beneficiaries of direct support ranged between 25,000–32,000 per year between fiscal years 2015/16 and 2020/21. During that interval, the level of support per beneficiary was between RWF103,000–162,000 per year. The annual budgetary cost of the programme has been relatively stable over the years, oscillating in between RWF14–19 billion (MINECOFIN 2021a), of which RWF2.5–4.5 billion were allocated to direct support transfers (FARG 2021).

Benefit 5: *School feeding programmes*

Currently, there are three school feeding programmes operating in Rwanda, which are described below based on (MINEDUC 2019).

The first one is a programme called 'One Cup of Milk per Child', funded by the National Early Childhood Development Programme (NECDP). In the programme, milk is served two times a week to pre-primary and primary students in grades 1–3. Available in 19 districts, the programme seeks to reduce malnutrition among children and to promote school retention. 'One Cup of Milk per Child' was launched by the government in May 2010, following a resolution by the Integrated Development Programme (IDP) which authorized Rwanda Agriculture Board (RAB) to implement the programme in schools. In 2018, the programme shifted from RAB to NECDP. The cost of this programme is RWF409 per serving per child. The programme is fully funded and operated by the government.

The second school feeding programme is a programme supported by MINEDUC and offered in public and government-aided secondary schools. In day schools, the programme is largely community-based as parents are primarily responsible for providing food for their children, either in kind or in cash. The government supplements parents' contributions by RWF 56 per day per student. This programme seeks to offer at least one nutritious meal per day for each student. The goal is to promote enrolment and regular attendance, and thereby to improve students' academic performance. Out of the total 455,487 students in secondary day schools, 413,235 students receive lunch at school, while the remaining get lunch at home. In secondary boarding schools, the government also subsidizes parents' contributions by providing an earmarked transfer for school feeding of RWF 56 per day per student. Typically, boarding school students are provided with three meals per day throughout the school year. The coverage for secondary boarding school children is 100 per cent. From September 2020, this programme was extended to primary and pre-primary schools, covering about three million children in total. In 2022, there were demands to increase the government contribution to the scheme due to soaring food prices (*The New Times* 2022a, 2022b). In academic year 2022–23, parents were asked to contribute RWF 975 for the school feeding programme in pre-primary and primary schools, and the budget provided by the government significantly increased (The New Times 2023d, 2023e).

The third school feeding programme, Home-Grown School Feeding (HGSF), is an initiative funded by the World Food Programme (WFP). It launched in 2002 in response to the increased food insecurity resulting from the Southern Africa Regional drought in that year. Currently, the programme is supporting at least 83,000 children in 104 primary schools located in four districts—Nyaruguru,

[5] Law No.°02/1998 of 22/01/1998 creating the national fund for assistance to victims of genocide and massacres perpetrated in Rwanda from 1 October 1990 to 31 December 1994. It was later revised in Law No. 69/2008 of 2008 and Law No. 81/2013 of 2013.

Nyamagabe, Karongi, and Rutsiro—where poverty and food insecurity are considered high. The cost of WFP-funded programmes is estimated at RWF120 for providing one child with one meal per day (consisting of beans, maize, vegetable oil and salt).

Other*: Government-funded social protection and development programmes*

Besides the poverty categorization process, the Ubudehe programme also includes a government-subsidized development programme. Every three to four years, steps are taken to analyse major development-related problems facing the given community, and to plan relevant activities and resources to address these problems through a collective action plan (Ubudehe projects). Each village is generally required to implement one household project and one community project. Funds for these projects have previously been collected from international organizations, local authorities, Rwandan ministries, and also churches and NGOs. Until 2020, each village received the same amount of funding (RWF 600,000 in 2009).

The community projects have included livestock purchases and breeding, building of clean water facilities, classrooms, terraces, health centers, and silos for storing produce. The household projects have included livestock breeding, small shops, agriculture and craft projects (Ayebale and Niringiye 2012). Due to the COVID-19 pandemic, however, this funding scheme was temporarily discontinued in 2020.

Additionally, different in-kind benefits—for example, in the form of food assistance and health services—are provided to vulnerable households both by the government and international organizations. The World Food Programme, for instance, provides food assistance and other types of in-kind support to refugees and other vulnerable groups in Rwanda (WFP 2021).

1.3.1.2 Contributory benefits

Lavers (2016) traces contributory social protection in Rwanda back to a pension scheme for formal employees established in 1962. Different contributory schemes are currently administered by the Rwanda Social Security Board (RSSB), which was established in 2010 through a merger of the Social Security Fund of Rwanda (SSFR) and Rwandaise d'Assurance Maladie (RAMA).[6] RSSB administers six schemes, listed and discussed below:

- Pension Scheme
- Occupational Hazards Scheme
- Maternity Leave Benefit Scheme
- Medical Scheme (also known as 'RAMA')
- Community-Based Health Insurance Scheme (CBHI)
- EjoHeza long-term saving scheme

In addition to the RAMA Medical Scheme and the CBHI Scheme, a third health insurance scheme exists and is covered below: the Military Medical Insurance (MMI), which is administered by the Ministry of Defence. EjoHeza, a long-term saving scheme sponsored by the government, covering both salaried and non-salaried workers, is not covered here, as it is not strictly a benefit scheme. EjoHeza is excluded from the model because of this and also due to the lack of data on contributions or associated pension benefits.

[6] The Rwanda Social Security Board (RSSB) was established by Law No. 45/2010 of 14/12/2010 in 2010, revised by Law No. 009/2021 of 16/02/2021, to administer social security in the country.

Benefit 6: *Pension Scheme*

The Pension Scheme has the objective of helping the workers who become incapable of working for a salary due to old age or invalidity, as well as the survivors of deceased workers.[7] The pension programme encompasses four different types of benefits: (i) old-age benefits, (ii) early retirement benefits, (iii) non-occupational disability benefits, and (iv) survivor's benefits.

i. *Old-age pensions:* From the age of 60, eligible retired workers (i.e., those that have contributed to the scheme for at least 15 years and ceased to perform any remunerated activity) each month receive 30 per cent of their average monthly earnings in the last five years, plus 2 per cent of the average monthly earnings for each 12-month period of contributions exceeding 15 years. If the insured did not contribute to the scheme for the five years immediately before the claim is made, the average monthly earnings are based on the average earnings in the last five years of employment. The minimum monthly old-age pension is 50 per cent of the legal monthly minimum wage (in practice, RWF13,000).[8] Individuals with less than 15 years of contributions receive a lump sum of 100 per cent of the insured's average monthly earnings in the last five years of contributions, multiplied by the number of years during which contributions were paid.

ii. *Early retirement benefits:* Individuals who are eligible to the old-age pension but are prematurely old (certified by a commission composed of recognized medical doctors established by the health minister) are entitled to early retirement. The benefits are computed on the same basis as old-age pension benefits.

iii. *Non-occupational disability benefits:* Workers who become disabled before reaching retirement age have the right to disability benefits if they (1) have contributed for at least three years; (2) have contributed up to six months within a period of 12 months before the date the disability was certified; and (3) have ceased to perform any remunerated activity. If the disability results from a hazard, the person is eligible for the benefits provided they are a member of the scheme at the time of the hazard. The benefits are computed on the same basis as old-age pension benefits. However, the period between the occurrence of disability and 60th birthday of the insured is considered as a period of contribution, but by taking into consideration only six months per year.

iv. *Survivor benefits:* Survivors of workers who fulfilled all requirements to benefit from above schemes (or were already receiving them) are eligible to survivor benefits. Eligible survivors include the surviving spouse (if they did not divorce the deceased); legitimate orphans (when non-employed and under 18, or under 25 if studying); and the parents of the deceased. Benefits are calculated as a percentage of the benefits the deceased was receiving or was entitled to. The surviving spouse is entitled to 50 per cent, children with one surviving parent 25 per cent, orphans with no surviving parents 50 per cent, and parents 50 per cent when the deceased leaves no spouse or children. However, the total amount of pension benefits provided to survivors cannot exceed the amount that the deceased would receive. When the individual dies before having contributed for at least

[7] The pension schemes are governed by Law No.°05/2015 of 30/03/2015 governing the organization of pension schemes.

[8] Note that the current minimum wage, RWF100 per day, was set in labour laws dating back to the early 1970s, and is far from present-day economic realities, and this lower bound is not binding. Consultations are going on to establish a new minimum wage for some years (The New Times 2020b). In the meantime, presidential orders are being issued to set minimum pension and occupational hazard benefits. Presidential Order No. 069/01 of 13/04/2018 increasing pension and occupational hazards benefits granted by RSSB, increased the minimum pension from RWF5,200 to RWF13,000 in 2018. The previous increase was decided in 2002 (Presidential Order No. 36/01 of 08/04/2002). See also The New Times (2021c).

15 years, the survivors are given a lump-sum allowance calculated as a fraction of the benefits that the deceased would have been entitled to.

Those not subjected to social security by law—namely the self-employed and those who previously had mandatory coverage—can also join the scheme on a voluntary basis, with affiliation available up to age 50.

Benefit 7: *Occupational Hazards Scheme*

The Occupational Hazard Scheme provides assistance to employees and employers who suffer from illnesses, occupational diseases, or work injuries (including accidents occurring while commuting to work). The Scheme was introduced in 2003.[9] The payable benefits covered by RSSB include (i) incapacity social security benefits, (ii) incapacity lump-sum benefits, (iii) temporary incapacity benefits, and (iv) survivor benefits. In addition, free medical care is provided (SSA 2019; RSSB 2021).

i. *Incapacity social security benefits:* For a total (100 per cent) disability, benefits are permanent and calculated as 85 per cent of the average monthly earnings in the three months preceding the hazard. When the incapacity is partial but higher than 15 per cent, the benefit is provided based on the degree of incapacity.

ii. *Incapacity lump-sum benefits:* If the degree of incapacity is less than 15 per cent, the incapacitated worker is eligible to a lump sum transfer equal to three years of benefits calculated according to the degree of incapacity.

iii. *Temporary incapacity benefits:* For temporarily incapable workers, the benefit is daily and set at 75 per cent of daily average earnings in the last three months before the hazard. The daily allowance is paid until full recovery, permanent disability, or up to 180 days (whichever occurs first).

iv. *Survivor benefits:* Survivors' allowances are fixed as percentages of salary. This percentage is set at 30 per cent for widows, 15 per cent for each child of the father or mother, 20 per cent for each child when both parents have deceased, and 10 per cent for each direct or adopted parent. A lump sum of 100 times the legal monthly minimum wage is also paid to the person who covered the funeral costs.

Benefit 8: *Maternity Leave Benefit Scheme*

Maternity leave benefits, equal to the last salary of the mother, are paid to new mothers throughout a 12-week maternity leave.[10] New mothers are eligible if they contributed to the scheme over at least one month before the leave. The benefit is paid by the employer, except for the last six weeks of the leave, which are paid by the RSSB. In exceptional cases (such as delivery complications), the leave can be extended by one month.

Benefit 9*: Health Insurance Schemes: RAMA, CBHI, MMI*

It is currently a legal requirement for all Rwandans to be covered by a health insurance (ILO 2021), with the main schemes being (i) *Rwandaise d'Assurance Maladie* (Rwanda Medical Insurance Scheme,

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[9] Law No.°06/2003 of 22/03/2003 modifying and completing the decree law of 22nd August 1974 concerning organization of social security. No specific relevant law has been published yet for occupational hazards, and the law of 22nd August 1974 as modified and complemented to date remains in force for occupational hazards.

[10] Law No.°003/2016 of 30/03/2016 to compensate all female employees absent from employment because of pregnancy, giving birth and subsequently caring for the new-born child.

RAMA) for public servants, those employed by state-owned enterprises, and certain private institutions, (ii) Community-Based Health Insurance (CBHI) scheme for the informal population, and (iii) Military Medical Insurance (MMI) for military personnel. In 2015/16, the CBHI scheme covered 81.6 per cent of Rwandans. Furthermore, an additional 6 per cent working in the formal economy were enrolled in RAMA, MMI, and private health insurances (Chemouni 2018). These schemes cover a part or entirety of the health bill for a number of medical care provisions, treatments, and prescribed drugs.

i. *RAMA:* The RAMA Medical Scheme has been in place since 2001.[11] Membership is automatic for all public employees, but private institutions can join the scheme if they have a payroll of at least seven employees. Pensioner affiliates can join the scheme if they receive RSSB pension and have previously contributed to the scheme. Coverage of the scheme extends to spouses and children of affiliates.

ii. *CBHI:* The CBHI scheme started in 1999 in a number of pilot districts. It was launched in response to the widespread inability of individuals to pay user fees at health facilities as well as the resulting low utilization of services and poor health indicators. In 2006, a national and compulsory policy was implemented,[12] CBHI schemes were standardized, and free premiums for the poor were formally put in place (Kalisa et al. 2016). In practice, individuals already subscribed to health insurance often did not have to join the CBHI in 2016 (Chemouni 2018).

iii. *MMI:* The MMI was established in 2005 to cover the medical costs of Rwanda Defence Forces and their eligible dependents. Members of other security organs (e.g., Rwanda National Police and National Intelligence and Security Services) and their eligible dependents have since been included in the scheme. Since 2012, all Rwandans can subscribe to it.[13]

Other*: Employer's obligations*

The current law regulating labour in Rwanda obliges employers to continue payments to employees who are sick or dismissed.[14] In cases of sickness, employers are liable to cover 100 per cent of the employee's monthly earnings for up to three months. The employee must be currently employed and provide a medical certificate. For sick leave lasting at least 15 days, a medical certificate signed by three medical doctors may be required. Employees can also take up to three additional months of unpaid leave. After that, the employer can terminate the employment contract. In case of dismissal due to economic or technological reasons, employers need to provide severance pay to employees with at least 12 months of service. The severance pay depends on the work history of the employee, and ranges from one month of the employee's average salary for less than five years of service, to six months of the employee's average salary for at least 25 years of service.

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[11] Law No.°24/2001 of 27/04/2001 on the establishment, organization and functioning of health insurance scheme for government employees (Original Law No.°13 of 01/07/2001, modified and complemented by Law No.°29/2002 of 19/09/2002).

[12] Article 33, Law No. 62/2007 of 30/12/2007 establishing and determining the organization, functioning and management of the mutual health insurance scheme. In practice, individuals already subscribed to health insurance often did not have to join the CBHI (Chemouni 2018). Law No.°03/2015 of 02/03/2015 governing the organization of the CBHI currently governs the scheme.

[13] Law No.°23/2005 of 12/12/2005 establishing Military Medical Insurance and determining its organization and functioning. Law No.°08/2012 of 29/02/2012 establishing MMI and determining its mission, organization and functioning.

[14] Law No.°66/2018 of 30/08/2018 regulating labour in Rwanda.

1.3.2 Social contributions

Social Contribution 1: *Contribution to the Pension Scheme*

Contribution rates are determined by Presidential Order[15] and are at 6 per cent of gross salary, to be paid equally by both the employer (3 per cent) and the employee (3 per cent). The minimum monthly earnings used to calculate contributions correspond to the legal monthly minimum wage. There are no maximum earnings used to calculate contributions.

Self-employed individuals that chose to participate to the scheme also pay 6 per cent of declared income. The minimum monthly earnings used to calculate contributions is the legal minimum salary. There is no maximum, but it cannot increase by more than 30 per cent every three years.

Social Contribution 2: *Contribution to the Occupational Hazards Scheme*

The rate of 2 per cent of gross salary is paid on behalf of mandatory members by employers.

Social Contribution 3: *Contribution to the Maternity Leave Benefit Scheme*

All employers and employees are required to contribute 0.3 per cent each of the employees' gross remuneration[16] towards a maternity fund (a total of 0.6 per cent per employee).

Social Contribution 4: *Contributions to the Health Insurance Schemes*

Contributions to the health insurance schemes differ:

i. *RAMA:* The contributions for RAMA are calculated at 7.5 per cent of monthly basic salary[17] for employees and employers, i.e., a total of 15 per cent of basic salary per worker. RSSB also covers the medical insurance for pensioners with a 7.5 per cent contribution deducted from their monthly pension.

ii. *CBHI:* Annual flat-rate contributions are RWF2,000 for members in the first Ubudehe category, RWF3,000 for members in categories 2 and 3, and RWF 7,000 for members in category 4. The government and development partners used to pay the contribution for category 1 individuals, subsidizing the scheme along with pharmaceutical products and medical devices (Mukangendo et al. 2018; SSA 2019). In 2023 however, those subsidies started to be reduced, as the system to target vulnerable households is in the process of being reformed (The New Times 2023a). A flat co-payment fee of RWF 200 per visit to the health centre is also collected by the CBHI unit and is intended to cover CBHI administration costs. A co-payment of 10 per cent of the total hospital bill is collected from the patient and retained by the hospital (Kalisa et al. 2016). In September 2020, an additional social security contribution of 0.5 per cent of the net wage was introduced. It is remitted by the employer from the employee's net salary.[18]

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[15] Those are currently determined by Presidential Order No.°009/01 of 10/05/2016. The pension law stipulates that the gross salary, used for the contribution calculations is composed of base salary, allowances, bonuses, other fringe benefits and cash value of benefits in kind (Law No.°05/2015 of 30/03/2015, Article 7).

[16] Gross salary is composed of basic salary, earnings, paid leave allowances, various allowances and bonuses, gratuities and other fringe benefits as well as the cash value of the benefits in kind (Ministerial Order No.°007/16/10/TC of 28/10/2016 relating to maternity leave benefits scheme).

[17] Article 3 of Law No.°016/2018 of 13/04/2018 defines a basic salary as the amount of money paid to an employee for the work performed, excluding allowances.

[18] Prime Minister's Order No.°034/01 of 13/01/2020 related to the community-based health insurance scheme subsidies.

iii. *MMI:* The contribution for Rwanda Defence Forces and other eligible security organs is paid by staff, at 5 per cent of gross wage, and by the government, at 17.5 per cent of gross wage. Others choosing to join the scheme are not eligible for the government subsidy, and their contribution rates are thus high (*The New Times* 2022c).

1.3.3 Taxes

1.3.3.1 Direct taxes

This section covers direct taxes in Rwanda. Personal income taxes are collected at the national level, while rental income taxes, immovable property taxes and trading license taxes are collected by the districts. In addition to those taxes, local government collect fees for certain services and authorizations.[19]

Tax 1: *Personal income tax and turnover tax*

According to the income tax law, Rwandan resident individuals are taxed on their worldwide income, while non-residents are taxed on their Rwandan-sourced income.[20] Taxable income derives from (i) employment income, (ii) investment income, and (iii) business profits. An annual tax declaration is required from the taxpayer unless the relevant employment or investment income is subject to withholding tax. In the latter case, employers are required to withhold, declare and remit relevant tax amounts on a monthly basis from their employee’s salary as Pay-As-You-Earn (PAYE) taxes.

From 2005 to 2022, those incomes were taxed at progressive rates shown in the left column of Table 1.4. On 28 October 2022, the Government of Rwanda has enacted the new income tax law (ITL 2022), which repealed the existing income law. According to the new law, monthly income up to RWF 60,000 (instead of RWF 30,000) is exempt from 2023 on. In 2024, the marginal tax rate for the second bracket is decreased to 10 per cent, the marginal tax rate for the third bracket is decreased to 20 per cent, and a fourth bracket, taxed at 30 per cent, is created for income above RWF 200,000 monthly. Those changes are also summarized in Table 1.4.

Agriculturalists and pastoralists benefit from a yearly exemption of RWF 12 million for income earned from agricultural or livestock activities. Moreover, capital gains on the sale or transfer of shares have been taxed separately at 5 per cent since 2018.

Table 1.4: Personal income tax rates, 2005–24

2005–22		2023		2024	
Income brackets (RWF, monthly)	Tax rate (%)	Income brackets (RWF, monthly)	Tax rate (%)	Income brackets (RWF, monthly)	Tax rate (%)
0–30,000	0	0–60,000	0	0–60,000	0
30,001–100,000	20	60,001–100,000	20	60,001–100,000	10
≥ 100,001	30	≥ 100,001	30	100,001–200,000	20
				≥ 200,001	30

Source: Authors’ construction based on Law N° 016/2018 of 13/04/2018 (article 12) and Law N° 027/2022 of 28/10/2022 (article 56).

[19] Presidential Order No.°25/01 of 09/07/2012 (determining fees levied for Public Services and Certificates delivered by Decentralized Entities) established the full list of local government fees.

[20] The Law N° 016/2018 of 13/04/2018 establishing taxes on income currently governs the personal income taxes in Rwanda. It replaced the Law N° 28/2012 of 10/09/2012 on direct taxes on income in 2018.

Only taxpayers who have a liberal profession are excluded from the turnover tax regime, while individuals active in the transport of persons and goods are imposed different flat tax amounts, described below.

Table 1.5: Individual turnover tax rates

	Turnover (RWF, annual)	Amount of tax (2018–22, annual)
Micro-enterprises	Below 2,000,000	RWF 0
	From 2,000,001 to 4,000,000	RWF 60,000
	From 4,000,001 to 7,000,000	RWF 120,000
	From 7,000,001 to 10,000,000	RWF 210,000
	From 10,000,001 to 12,000,000	RWF 300,000
Small enterprises	From 12,000,001 to 20,000,000	3% of turnover

Notes: Small enterprises may renounce to the lump sum imposition by opting for the 'real' regime by carrying out accounting in compliance with relevant laws. Business profits are then taxed at 30 per cent.

Source: Authors' construction based on Rwandan legislation, namely Law N° 016/2005 of 18/08/2005 on Direct Taxes on Income, Law N° 28/2012 of 10/09/2012 and Law N° 016/2018 of 13/04/2018 (articles 12 and 45).

Individuals with micro and small enterprises are allowed to opt for a turnover tax regime, which means that they do not pay taxes on profits according to the above regime. The associated turnover tax liabilities are listed in Table 1.5. Opting for the turnover tax requires an annual turnover of less than RWF 20 million. With a larger turnover, business profits are always taxed at a statutory rate of 30 per cent, which is also the corporate income tax rate levied on all incorporated companies.

The tax rates on vehicles transporting persons depend on the number of passengers and fall between RWF96,000–480,000 for vehicles with a capacity of 8–40 places. The rates on vehicles transporting goods depend on the type of vehicle and their loading capacity, falling between RWF60,000–2,340,000 for vehicles with loading capacity between 1 and 30 tons. Table 1.6 lists the lump sum taxes for activities of road transport of persons and goods that depend only on the type of vehicle.

Table 1.6: Lump sum taxes for activities of road transport of persons and goods

Type of vehicle	Tax (RWF, annual)
Car (taxi)	88,200
Motorcycle	72,000
Moped	36,000
Hearse/private ambulance	100,000
Jeep/loader/break-down vehicle	307,200
Bulldozer	780,000

Source: Authors' construction based on Rwandan legislation, namely Law No.°016/2005 of 18/08/2005 on Direct Taxes on Income, Law No.°28/2012 of 10/09/2012, and Law No.°016/2018 of 13/04/2018 (page 130).

Tax 2: *Rental income tax*

Rental income tax[21] is levied on the income generated from rented land and buildings by any person or business who is not subject to corporate income tax. There are two different methods of calculating taxable income for rental income tax, depending upon whether the taxpayer has taken out bank loans to fund the construction or purchase of the rented immovable property.

[21] Rental income in Rwanda is governed by Law No.°75/2018 of 07/09/2018 determining the sources of revenue and property of decentralized entities. It is applied to the 2019 tax period and onwards. This law replaced the previous Law No.°59/2011 of 31/12/2011 on the sources of revenue and property of decentralized entities and their management.

If the taxpayer has no loan related to the immovable property, taxable income is obtained by deducting 50 per cent from the gross rental income, which is considered as expenses incurred by the taxpayer for the maintenance and upkeep of the rented property. When the taxpayer has a loan related to the immovable property, taxable income is obtained by deducting from the gross rental income 30 per cent (or 50 per cent, since 2019) considered as expenses incurred by the taxpayer on maintenance and upkeep of the rented property, as well as bank interests paid.

The rental income tax is progressive, with different marginal tax rates depending on taxpayer's taxable rental income, shown in Table 1.7. Rates and brackets have not been changed since the introduction of the tax in 2011.

Table 1.7: Rental income tax

Taxable income (RWF, annual)	Marginal tax rate (%)
Up to 180,000	0
Between 180,001 and 1,000,000	20
From 1,000,001 and above	30

Source: Authors' construction based on Rwandan legislation, namely Law No.°59/2011 of 31/12/2011 and Law No.°75/2018 of 07/09/2018.

Tax 3: *Immovable property tax*

Immovable property taxes include a tax levied on the market value of buildings and land, and a tax levied on the surface of plots of land.[22] Market value is based on the purchase price, self-assessment, or an evaluation by a certified valuer, and is updated every five years (four years up to 2018), or when the value of the fixed asset increases or decreases by more than 20 per cent due to changes.

The tax rate applied to buildings generally depends on the land usage and the tax year. Table 1.8 shows the rates per year on different building types by tax year. One residential building, which the owner intends to occupy as his or her residence, is exempt from building tax, and only land tax must be paid. In 2023, the Ministry of Finance and Economic Planning (MINECOFIN) approved a reform capping tax charges on commercial buildings at RWF 30 billion (MINECOFIN 2023). This reform also exempts apartments in a condominium from both land and building taxes and reduces the tax on secondary apartments on the first three floors to 0.25 per cent of property value. Immovable property determined by the District Council and donated to vulnerable groups is completely exempt from the tax.

The tax on the surface of a plot of land is determined by the location of the land and land use and is set by the District Council. According to the recently approved tax reforms (MINECOFIN 2023), it ranges from RWF 0 to RWF 80 per square meter per year (compared to RWF 0 to RWF 300 until 2022). If the land is used for agriculture or livestock activities, the first 20,000 square meters are exempt. The tax is increased by 50 per cent on land acquired after 1st January 2019 in excess of the standard size of a plot (300 square meters). The tax rate is doubled if the land is undeveloped, i.e., if it has not been used for the intended purpose. Since November 2019, however, the 50 per cent tax increase on excess land was abolished by the Supreme Court (The New Times 2019b).

[22] Immovable taxes are governed by Law N° 75/2018 of 07/09/2018 determining the sources of revenue and property of decentralized entities. This law replaced the previous Law N° 59/2011 of 31/12/2011 on the sources of revenue and property of decentralized entities and their management.

Table 1.8: Tax rates for buildings

Type of building	Year	Tax rate per year (%)
Commercial buildings	Before 2019	0.10
	2019	0.20
	2020	0.30
	2021	0.40
	2022–23	0.50
	2024 (proposed)	0.30
Residential buildings	Before 2019	0.10
	2019	0.25
	2020	0.50
	2021	0.75
	2022–23	1.00
	2024 (proposed)	0.50
Industrial buildings; buildings belonging to small and medium enterprises; and buildings intended for activities other than residential, commercial, and industrial	2019 and onwards	0.10

Source: Authors’ construction based on Rwandan legislation, namely Law N° 75/2018 of 07/09/2018.

Tax 4: *Trading license tax*

Any person who commences a profit-oriented activity in Rwanda should pay a trading license tax.[23] The basis for the calculation of this tax for VAT-registered profit-oriented activities is the turnover of the previous year, approved by the Rwanda Revenue Authority (RRA) and submitted by RRA to the concerned decentralized entity. Taxes due are given in Table 1.9.

Table 1.9: Trading license tax: VAT-registered activities

Turnover (RWF, annual)	Tax due (RWF, annual)
Up to 40,000,000	60,000
Between 40,000,001 and 60,000,000	90,000
Between 60,000,001 and 150,000,000	150,000
From 150,000,001 and above	250,000

Source: Authors’ construction based on Rwandan legislation, namely Law No. 75/2018 of 07/08/2018 determining the source of revenue and property of decentralized entities.

Other specific profit-oriented activities are subject to different taxes, listed in Table 1.10.

[23] Trading license taxes are governed by Law No.°75/2018 of 07/09/2018 determining the sources of revenue and property of decentralized entities. This law replaced the previous Law No.°59/2011 of 31/12/2011 on the sources of revenue and property of decentralized entities and their management.

Table 1.10: Trading license tax: other activities

Type of activity	Rural areas (RFW, annual)	Towns (RFW, annual)	City of Kigali (RFW, annual)
Vendors without shops, small scale technicians	4,000	6,000	8,000
Transporters of people and goods on motorcycle	8,000	8,000	8,000
All other vehicles besides bicycles	40,000 per vehicle	40,000 per vehicle	40,000 per vehicle
Transport activities by motorboat	20,000 per boat	20,000 per boat	20,000 per boat
Other profit-oriented activities	20,000	30,000	40,000

Source: Authors' construction based on Rwandan legislation, namely Law No. 75/2018 of 07/08/2018 determining the source of revenue and property of decentralized entities.

1.3.3.2 Indirect taxes

Indirect taxes described here include value-added taxes (VAT), excise duties (or consumption taxes), and customs duties.

Tax 5*: Value-added tax*

Value-added tax has been levied since 2001 on the supply of taxable goods and services in Rwanda as well as on the importation of taxable goods and services into Rwanda.[24] The threshold for VAT registration is a yearly taxable turnover of RWF 20 million. The standard VAT rate has been 18 per cent since its introduction.

Some goods are exempt or zero-rated, seeking to increase either their affordability or competitiveness (e.g. services rendered to tourists). Suppliers who provide zero-rated services or goods are entitled to recover the input VAT incurred in generating the supply. This is unlike exempt supplies, where input VAT recovery is not allowed.

The zero-rated goods and services mainly include exports, goods sold in shops that are exempt from tax as provided for by the law governing customs, services rendered to a tourist and supplies to privileged persons (such as diplomats and international organizations). Exempted goods and services include supply of water service, goods and services for health purposes, educational materials and services, transport services, books and newspapers, financial and insurance services, lending or leasing interests in land or building for residential purposes, funeral services, energy supplies, all unprocessed agricultural and livestock products, mobile handsets, and equipment for information, communication, and technology. The cost of these exemptions to the government is estimated at RWF 117.9 billion per year (MINECOFIN 2019).

Tax 6*: Excise duty*

Excise duty (or consumption tax) is a tax applied to specific products, in place since 2006,[25] to discourage consumption associated with negative social impacts. Excise taxes can be used, for example, to reduce the costs of healthcare and policing whilst raising significant revenues for further government spending. Some duties were reformed in 2019, including the excise duty on alcoholic beverages produced with local ingredients and the duties on cigarettes.

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[24] Law N° 06/2001 of 20/01/2001 on the Code of Value Added Tax. Law N° 37/2012 of 9/11/2012 establishing the value-added tax, as well as Law N° 40/2016 of 15/10/2016 and Law N° 02/2015 of 25/02/2015 modifying and completing it, currently govern the VAT.

[25] Law N° 26/2006 of 27/05/2006 determining and establishing consumption tax on some imported and locally manufactured products. This law was modified by Law N° 56/2006 of 31/12/2006 and Law N° 57/2011 of 31/12/2011, and then replaced in 2019 by Law N° 025/2019 of 13/09/2019 establishing the excise duty.

Table 1.11: Rates of excise duties on different taxable products

Product	Excise duty (until 2019), %	Excise duty (after 2019)
Cigarettes	150%	36% of retail price and RWF 130 per pack of 20 cigarettes
Wine produced with locally sourced inputs	70%	30%
Other wine	70%	70%
Brandies, liquors and whiskey	70%	70%
Beer produced with locally sourced inputs	60%	30%
Other beer	60%	60%
Lemonade, soda and other non-natural juices	39%	39%
Premium oil (excluding benzene)	RWF183 per litre	RWF183 per litre
Gas oil	RWF150 per litre	RWF150 per litre
Lubricants	37%	37%
Vehicles with an engine capacity of more than 2500cc	15%	15%
Industrial packed mineral water	10%	10%
Vehicles with an engine capacity of between 1500–2500cc	10%	10%
Powdered milk	10%	10%
Telephone communications	10%	10%
Telecommunications	8%	8%
Natural fruit juices	5%	39%
Vehicles with an engine capacity of less than 1500cc	5%	5%

Source: Authors' construction based on RRA Tax Handbook (RRA 2022) and Law No.°26/2006 of 27/05/2006 determining and establishing consumption tax on some imported and locally manufactured products.

Tax 7: *Customs duties*

When goods are imported in or exported out of Rwanda, a number of duties apply. Those duties aim at ensuring fair competition between local and foreign businesses, encouraging intra-regional trade, ensuring compliance of income taxes, supporting domestic manufacturing industries, and raising funds for beneficial projects. More precisely, besides VAT and excise duties that are paid on goods irrespectively of their origin, the imported goods are subject to a withholding tax of 5 per cent (which can be claimed back in subsequent domestic income tax declarations), an infrastructure development levy for goods from outside the East African Community (EAC), a fuel levy and strategic reserves levy for imported fuel and petroleum products, an African Union levy, a motor vehicle registration fee for imported motor vehicles, road tolls for foreign registered trucks entering Rwanda, and computer processing, warehouse and quality inspection fees.

A number of East-African countries created the East African Community (EAC) Customs Union, within which trade is encouraged by zero-rated import duties and no quotas. Moreover, a number of duties and procedures including safety measures, valuation methods, trade policies and terminologies are shared and detailed in the Common External Tariff (CET) and EAC Customs Management Act (CMA). Generally, rates specified in the CET follow the rules outlined in Table 1.12. A fourth band, taxed at 35 per cent, was introduced in May 2022 to encourage regional trade and production capacity, protect nascent industries, and promote regional food security. The list of goods taxed at 35 per cent includes dairy and meat products, cereals, cotton and textiles, iron and steel, edible oils, beverages and spirits, furniture, leather products, fresh-cut flowers, fruits and nuts, sugar and confectionery, coffee, tea and spices, textiles and garments (CET 2022).

Table 1.12: Common external tariffs

Product	CET custom duty
Capital goods and raw materials	0%
Intermediate goods	10%
Finished goods	25%
Specific list of goods (since 2022)	35%
Sensitive goods	Varying rates, from 35% to 100%

Source: Authors' construction based on RRA Tax Handbook (RRA 2022).

Rwanda is also a member of the Common Market for Eastern and Southern Africa (COMESA), gathering 21 countries in a single market. Imports from COMESA countries that meet conditions as specified by the COMESA rules of origin are given preferential treatment through a reduction of rates ranging from 0% to 100%,[26] depending on the country of origin and based on the principle of reciprocity.

1.4 Future reforms and trends

The Medium-Term Revenue Strategy (MTRS), a roadmap for tax reforms over the three-year period from 2021/22 to 2023/24, was elaborated to be aligned to the objectives of Rwanda's long-term social and economic objectives, outlined in the First National Strategy for Transformation (NST 1), itself an implementation instrument for the remainder of Vision 2020 and for the first four years of Vision 2050 national development plans.

The overall goal of the MTRS is to 'lay the foundation to achieve upper middle-income status by 2035 and high-income status by 2050' (MINECOFIN 2021b). To this end, the MTRS aims at simplifying the tax system, minimizing the cost of compliance, and distributing the tax burden more proportionally to wealth. The MTRS also aims at raising additional tax revenues to finance investments focusing on 'improving the education system and developing human capital to improve labour productivity, supporting technological efforts to enhance efficiency gains in agriculture, and establishing high quality infrastructure' (MINECOFIN 2021b).

Reforms outlined in the MTRS include new taxes, tax parameter modifications, and administrative reforms. Those reforms altogether are expected to raise the tax-to-GDP ratio by 1 per cent between July 2021 and June 2024, to eventually meet the tax-to-GDP target of 21.5 per cent by 2035. The increases in tax revenues will be mainly driven by additional income from CIT and administrative reforms improving compliance, as can be seen in Table 1.13.

Table 1.13: Revenue impact of the MTRS reforms

MTRS reform proposal	Revenue impact over MTRS horizon (% of GDP)
Tax policy reforms	0.46
PIT reforms	-0.4
CIT reforms	0.8
VAT reforms	-0.1
Excise duty reforms	0.15
Administrative reforms	0.54

Source: Authors' construction based on MTRS (MINECOFIN 2021b).

[26] The 100% reduction applies to 17 of the 21 COMESA countries. Only Eritrea and Ethiopia benefit from a reduction of 80% and 10%, respectively, while DRC and Somalia have no reduction (RTP 2023).

MTRS reforms are grouped into five different pillars: human development, competitiveness, agricultural and wealth creation, urbanization and agglomeration, and accountable and capable state.

In the human development pillar, a personal income tax reform is detailed, in which the tax-exempt bracket is increased, and a new 10 per cent taxed bracket is introduced, in order to protect the poorest workers and increase the progressivity of the scheme. This reform is already implemented in the income tax law N° 027/2022, which splits the reform in two phases: the extension of the tax-exempt bracket takes place in 2023, while the introduction of the 10 per cent taxed bracket took place in 2024. This reform increases the disposable income of many workers and remedies to the significant bracket creep that accumulated over the years, as brackets were never adjusted for inflation since their revision in 2005. An important reform of the excise taxes is also considered in this pillar, in which unhealthy products as cigarettes, alcohol, and sweet beverages would be more heavily taxed, and healthy products as bottled water and powdered milk less heavily taxed.

The competitiveness pillar contains a large number of reform proposals that aim at stimulating investment and boosting competitiveness. Many of them are tax incentives—such as reduced VAT rates on specific raw materials and machinery, reduced PAYE rates for companies that create permanent jobs, CIT credits for performing companies—and accounting rules changes—such as full-expensing of investment costs or indefinite carry forward of losses. A lower CIT rate combined with a broader base is also considered. To tackle erosion of the tax base by the largest multinational companies, a minimum alternative tax, based on turnover, is mentioned. To address the growing share of products and services sold online, the government also plans to introduce a VAT on digital services.

The pillar related to agricultural and wealth creation aims at supporting a shift from subsistence towards productive, professional farms. To this end, VAT exemptions on agricultural and livestock products as well as on agricultural inputs and materials will be maintained.

The urbanization and agglomeration pillar has the objective of encouraging private sector investment in affordable housing and promoting the development of low-emission cities. The measures in this pillar include the zero-rating of VAT for the construction of new residential houses and measures to incentivize better car purchases, such as excise duties more strongly linked to the emissions of the vehicles and tax exemptions for electric vehicles.

The last pillar, on accountable and capable state institutions, contains measures to improve compliance by leveraging new technologies in the revenue administration and modernizing RRA's business operations. Cooperation on policy design issues between RRA and partners like international agencies will moreover be reinforced.

Besides the general tax trends contained in the MTRS, other changes have been made and discussed in reaction to recent events that degraded the economic context. The consequences of crises like the COVID-19 pandemic and the Russian invasion of Ukraine for example led to urgency measures to cushion citizens against inflationary pressures. Such measures include fossil fuel, fertilizer, and public transport subsidies introduced in May 2022 (The New Times 2021d, 2022f), as well as reduced VAT rates on maize flour and rice since September 2023.[27]

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[27] Law n° 049/2023 of 05/09/2023 on establishing value-added tax.

2 Simulation of taxes and benefits in RWAMOD

2.1 Scope of simulation

Table 2.1 gives an overview of existing benefit policies in Rwanda, specifying which policies are simulated in RWAMOD and which are just 'included', i.e. carried out to the model from the original survey data. Table 2.2 provides the same information for taxes and social security contributions. Parameters of simulated policies can be changed in the model, allowing to predict the effect of reforms. Included policies cannot be changed in the model but allow to have a more exhaustive view of the tax-benefit measures impacting households in Rwanda. Detailed information on how the simulated policies are modelled is provided below.

Table 2.1: Simulation of benefits in RWAMOD

	Variable name	Treatment in RWAMOD							Why not simulated?
		2017	2018	2019	2020	2021	2022	2023	
VUP Direct Support	*bsa_s*	S	S	S	S	S	S	S	-
VUP Public Works	*bpw_s*	I	I	I	I	I	I	I	Insufficient information
Girinka	*bsals_s*	I	I	I	I	I	I	I	Insufficient information
RDRP	*bml_s*	I	I	I	I	I	I	I	Insufficient information
FARG	*bsaot_s*	I	I	I	I	I	I	I	Insufficient information
School feeding programmes	/	E	E	E	E	E	E	E	Insufficient information
Maternity benefits	/	E	E	E	E	E	E	E	Insufficient information
Occupational hazard benefits	/	E	E	E	E	E	E	E	Insufficient information
RSSB Pensions	*poa_s*	I	I	I	I	I	I	I	Insufficient information

Notes: 'S' means that the policy is simulated, although some minor or very specific rules may not be simulated. 'I' means that the policy is not simulated but is instead carried out directly from the input data to the model (i.e., specifying a benefit of a given amount to a given household exactly as it is reported in the survey data). Benefits are added to the disposable income of individuals and households in the same way regardless of whether they are simulated or carried out from the input data. 'E' means that the policy is not simulated or included in the model.

Source: Authors' compilation based on the RWAMOD model.

Table 2.2: Simulation of taxes and social contributions in RWAMOD

	Variable name	Treatment in RWAMOD							
		2017	2018	2019	2020	2021	2022	2023	Why not simulated?
Taxes									
Presumptive/turnover tax	*ttn_s*	S	S	S	S	S	S	S	-
Personal income tax	*tin_s*	S	S	S	S	S	S	S	-
Rental Income tax	*tre_s*	S	S	S	S	S	S	S	-
Immovable property tax	/	E	E	E	E	E	E	E	Insufficient information
Trading licence tax	/	E	E	E	E	E	E	E	Insufficient information
VAT	*tva_s*	S	S	S	S	S	S	S	-
Excise duty	*tex_s*	S	S	S	S	S	S	S	-
Social contributions									
Employee social security contributions									
Pensions	*tsceepi_s*	S	S	S	S	S	S	S	-
Maternity leave	*tsceeml_s*	S	S	S	S	S	S	S	-
Health insurance (RAMA)	*tsceehl_s*	S	S	S	S	S	S	S	-
Health insurance (MMI)	*tsceehl01_s*	S	S	S	S	S	S	S	-
Health insurance (CBHI)	*tsceehl02_s*	S	S	S	S	S	S	S	-
Employer social security contributions									
Pensions	*tscerpi_s*	S	S	S	S	S	S	S	-
Occupational hazards	*tscerac_s*	S	S	S	S	S	S	S	-
Maternity leave	*tscerml_s*	S	S	S	S	S	S	S	-
Health insurance (RAMA)	*tscerhl_s*	S	S	S	S	S	S	S	-
Health insurance (MMI)	*tscerhl01_s*	S	S	S	S	S	S	S	-
Pensioner social security contributions									
Health insurance	*tscpehl_s*	S	S	S	S	S	S	S	-

Notes: 'S' means that the policy is simulated, although some minor or very specific rules may not be simulated.

Source: Authors' compilation based on the RWAMOD model.

2.1.1 Benefits

The only benefit that is simulated in RWAMOD is VUP Direct Support *(bsa_s)*. VUP Public Works *(bpw_s)*, Girinka *(bsals_s)*, RDRP *(bml_s)*, FARG *(bsaot_s)*, and RSSB pensions *(poa_s)* are included in the model from survey data but not simulated.

As for Girinka, the survey data shows whether a given household has ever received a cow under the programme and still owns it. The data does not indicate whether the cow was received specifically during the survey year. The resulting over-simulation of annual Girinka recipients has been addressed in RWAMOD by downwardly adjusting benefit receipt based on external estimates. Specifically, in order to match external estimates of annual recipient households provided by MINAGRI (2022), we randomly assign a cow to 18–25 per cent of households who report to have ever received a cow under the programme. The exact shares are selected based on the statistics available for each year between 2017 and 2020. For subsequent years without external validation data, we use the external estimate from 2020 (25,500 households; see Section 4.3 for the complete external validation). In addition to missing information on annual Girinka recipients, the survey data does not reveal the annual monetary value of a cow. The estimated value of the benefit for recipient households (RWF12,000 per year or 9,333 per month) is computed by dividing the typical price of a cow (RWF560,000) by its expected production lifetime of five years.

Maternity benefits and occupational hazard benefits are excluded from the model as there is insufficient information regarding eligibility and no relevant information on benefit receipt available in the EICV data.

2.1.1.1 Non-contributory benefits

VUP Direct Support (bsa_s)

VUP Direct Support is a social protection benefit or a direct cash transfer to vulnerable households.

- *Beneficiary unit:* The tax unit is at the level of the household.
- *Eligibility:* Households are eligible if they are in Ubudehe category 1 and are labour-constrained. The modelling seeks to follow the conditions specified in the legislation. Namely, individuals are considered labour-constrained if they are chronically sick or disabled *(les=8),* studying *(les=6),* or too young *(dag<18)* or too old *(dag>64)* to work. Starting from the 2019 policy system, households are also labour-constrained if there is one non-labour-constrained person and one disabled or chronically sick person in the household.
- *Benefit amounts:* The amount of the benefit varies with household size, as shown in Table 2.3.

Table 2.3: VUP Direct Support

Household size	Benefit (RWF, monthly)
1	7,500
2	12,000
3	15,000
4	18,000
5 or more	21,000

Source: based on NISR (2018).

2.1.1.2 Contributory benefits

No contributory benefits are simulated in RWAMOD.

2.1.2 Social contributions

All social contributions administrated at the national level in Rwanda are modelled in RWAMOD.

- *Contribution unit:* The tax unit is at the level of the individual.
- *Contribution restrictions:* Simulation of social security contributions is restricted to those in the formal sector (lfo=1; see section 3.3.1 for details on variable construction). Exceptions include pensioners' health insurance contributions, which are paid by pensioners who receive RSSB pensions based on the input data *(poayn=1),* and CBHI contributions, which are restricted to informal workers *(lfo=0)*. RAMA health insurance contributions are further restricted to formal public sector workers not in armed forces (lindi equals to 9, 10, or 11, and loc≠0). MMI health insurance contributions are restricted to formal workers in the armed forces (loc=0).
- *Contribution base:* The base for the calculation of the social security contributions is the gross employment income (yem). Exceptions include the pensioners' health insurance contributions, where the base consists of RSSB pensions recorded in the data (poa), and CBHI contributions, which are fixed annual amounts that depend on the individual's Ubuhede category (les01).
- *Contribution schedule:* Most contributions are calculated as a percentage of the gross employment income. Some contributions are due by the employee: 3 per cent for the pension scheme; 0.3 for the maternity leave scheme; 7.5 for the RAMA medical insurance scheme (also for pensioners); and 5 for those in the MMI scheme. Others are due by the employer: 3 per cent for the pension scheme; 2 for the occupational hazard scheme; 0.3 for the maternity leave

scheme; 7.5 for the medical insurance scheme; and 17.5 for the MMI scheme (paid by the government). In September 2020, an additional social security contribution of 0.5 per cent of the net wage of employees was introduced to finance the CBHI scheme (currently not modelled).

2.1.3 Taxes

RWAMOD simulates personal income taxes, presumptive or turnover taxes, rental income taxes, value-added (VAT) taxes, and excise duties. Immovable property taxes and trade licence taxes are currently not modelled, due to lack of information on the value of owned properties and exact occupation, respectively.

2.1.3.1 Direct taxes

Personal income tax (tin_rw)

Personal income tax (PIT) is levied on employment income, investment income, and business profits, and requires an annual tax declaration from the taxpayer unless relevant income is subject to withholding tax (PAYE), which is then declared and paid by the employer. The model implementation of the tax is as follows:

- *Tax unit:* The tax unit is at the level of the individual (although most of the smaller income sources are only available, and thereby taxed, at the household level. In other words, incomes are reported and income taxes simulated only for the head of household.
- *Tax base:* The tax base for personal income tax adheres as closely as possible to the definition of taxable income contained in Chapter II of Law No.°016/2018 of 13/04/2018 establishing taxes on income' (see Section 1.4.1) and is composed of:
    a. Self-employment income (yse; business profits from main and secondary job, individual level),
    b. Profit on agriculture and livestock (yag; profit from agricultural production; household level),
    c. Employment income (yem; from main and secondary job, individual level),
    d. Investment income (yiy; rent, lease, interest or profit-sharing of non-business household assets; household level), and
    e. Other income (yot; royalties and copyright income; household level).
- Restrictions, exemptions and allowances:
    a. The model simulates PIT on self-employment income only if the taxpayer is a self-employed worker who cannot opt for the turnover tax regime due to a large turnover (*ytn01* of more than RWF20 million) and obtains income from their business.
    b. PIT is applied to profit on agriculture and livestock from RWF12 million and up due to the associated tax exemption on income earned from these activities. In practice, this means that income tax does not apply to subsistence agriculture.
    c. PIT applied to employment income is restricted to those in the formal sector (lfo=1).
    d. Capital gains taxes are not currently modelled in RWAMOD or other SOUTHMOD models.
- *Tax schedule:* The tax base is taxed according to brackets and rates shown earlier in Table 1.4 in Section 1.3.3.1.

Presumptive/turnover tax (ttn_rw)

Presumptive or turnover tax is levied on the turnover of unincorporated businesses that have a turnover of less than RWF20,000,000.

- *Tax unit:* The tax unit is at the level of the individual.

- *Tax base:* The tax base consists of non-farm turnover *(ytn01; household level)*.
- *Tax schedule:* The tax base is taxed at rates shown earlier in Table 1.5 in Section 1.3.3.1.
- *Modelling notes:* Based on the legislation, individuals can opt for the 'real' regime with profit taxation even if their business turnover is lower than RWF20,000,000. In that case they have to notify the tax authority. As profits are not available in EICV, it is assumed that all micro enterprises and small enterprises are taxed on turnover.

Rental income tax (tre_rw)

Rental income tax is a tax levied on the income generated from rented land and buildings.

- *Tax unit:* The tax unit is at the level of the individual.
- *Tax base:* Taxable rental income is obtained by deducting 50 per cent from the gross rental income *(ypr; household level),* which are considered expenses for the maintenance of the rented property.
- *Tax schedule:* The tax base is taxed at rates shown earlier in Table 1.7 in Section 1.3.3.1. Rates and brackets have not been changed since the introduction of the tax.
- *Modelling notes*. Based on legislation, when the taxpayer has a loan related to the immovable property, taxable income is obtained by deducting 30 per cent from gross rental income (or 50 per cent since 2019) plus bank interests paid. As no information on loans related to immovable property are not reported in the data, it is assumed that taxpayers have no such loans and their taxable rental income is obtained by deducting 50 per cent from gross rental income.

2.1.3.2 Indirect taxes

Value-added tax (tva_rw)

Value-added tax (VAT) is levied on the supply of taxable goods and services, as well as on the importation of taxable goods and services into Rwanda.

- *Tax unit:* VAT is paid to the state by businesses. However, as the tax is to a large extent passed on to final consumers, it is modelled as a household-level tax and applied to households' consumption of standard-rated goods or services.
- *Tax base:* The tax base is the total expenditure on standard-rated goods and services that have been purchased by households. No information on the retailers (e.g., between VAT-registered and others) is used in narrowing down the expenditures that make up the VAT tax base.
- *Tax schedule:* The standard rate of VAT is 18 per cent. Selected goods are exempt or taxed at a rate of zero per cent (see Section 1.3.3.2 for details).
- *Modelling notes:* A total of 303 purchasable items are listed in the income list *il_exp_vat01* in policy *tva_rw*, with a total of 147 zero-rated or VAT-exempt items shown as 'n/a' across all years and therefore not included in the VAT tax base.

Excise duty (tex_rw)

Excise duties (also 'consumption taxes') are charged on the consumption of certain products, generally to discourage consumption that is associated with negative social impacts.

- *Tax unit:* Excise duties are paid to the state by businesses. However, as the tax is primarily passed on to the final consumers, it is modelled as a household-level tax and applied to households' consumption of selected goods or services.
- *Tax base:* The tax base is the total expenditure on selected goods and services by households or, with selected items, derived based on the volume or quantity of the products purchased.
- *Tax rates:* Expenditures on the relevant consumption items are taxed at rates shown earlier in Table 1.11 in Section 1.3.3.2. The excise duty rates changed in 2020.

- *Modelling notes:* Excise duty is simulated for 11 items in RWAMOD. These items are (1) cigarettes; (2) wine, brandies, liquors and whiskey; (3) telecommunications; (4) fruit juice; (5) soda and lemonade; (6) mineral water; (7) beer; (8) telephone communications; (9) vehicle fuel; (10) lubricants; and (11) powdered milk.

2.2 Order of simulation and interdependencies

Table 2.4 presents the order of the main elements of the Rwandan system for 2017–23 for simulations. 'DEF' refers to definitional policies, 'TAX' to tax policies, and 'BEN' to benefits.

Table 2.4: RWAMOD spine: order of simulation

Name of policy	Contents	2017	2018	2019	2020	2021	2022	2023
uprate_rw	DEF: Uprating factors	On	On	On	On	On	On	On
neg_rw	DEF: Recode negative incomes to zero	On	On	On	On	On	On	On
lma_rw	DEF: COVID-19 transitions and shocks (2020–21)	*Off*	*Off*	*Off*	On	On	*Off*	*Off*
ilsdef_rw	DEF: Standard income lists	On	On	On	On	On	On	On
ildef_rw	DEF: Model-specific income lists	On	On	On	On	On	On	On
ildef_stats_rw	DEF: Statistics Presenter income lists	On	On	On	On	On	On	On
ildef_exp_rw	DEF: Expenditure income lists (COICOP)	On	On	On	On	On	On	On
tudef_rw	DEF: Define assessment units	On	On	On	On	On	On	On
constdef_rw	DEF: Define constants	On	On	On	On	On	On	On
spl_rw	DEF: Rwandan poverty lines	On	On	On	On	On	On	On
ses_rw	DEF: Equivalence scales	On	On	On	On	On	On	On
tsceepi_rw	SIC: Employee pension contribution	On	On	On	On	On	On	On
tscerpi_rw	SIC: Employer pension contribution	On	On	On	On	On	On	On
tscerac_rw	SIC: Employer occupational hazard insurance contribution	On	On	On	On	On	On	On
tsceeml_rw	SIC: Employee maternity leave contribution	On	On	On	On	On	On	On
tscerml_rw	SIC: Employer maternity leave contribution	On	On	On	On	On	On	On
tsceehl_rw	SIC: Employee health insurance contributions (RAMA, MMI, CBHI)	On	On	On	On	On	On	On
tscerhl_rw	SIC: Employer health insurance contributions (RAMA, MMI)	On	On	On	On	On	On	On
tscpehl_rw	SIC: Pensioner health insurance contribution	On	On	On	On	On	On	On
ttn_rw	TAX: Presumptive/turnover tax	On	On	On	On	On	On	On
tin_rw	TAX: Personal income tax	On	On	On	On	On	On	On
tre_rw	TAX: Rental income tax	On	On	On	On	On	On	On
bsa_rw	BEN: VUP Direct Support	On	On	On	On	On	On	On
bpw_rw	BEN: VUP Public Works	On	On	On	On	On	On	On
bsals_rw	BEN: Girinka programme	On	On	On	On	On	On	On
bml_rw	BEN: RDRP benefits	On	On	On	On	On	On	On
bsaot_rw	BEN: FARG benefits	On	On	On	On	On	On	On
poa_rw	BEN: RSSB pensions	On	On	On	On	On	On	On
tva_rw	TAX: Value-added tax (VAT)	On	On	On	On	On	On	On
tex_rw	TAX: Excise duty and VAT on excise duty items	On	On	On	On	On	On	On
xhhadj_rw	DEF: Adjust consumption to new disposable income	On	On	On	On	On	On	On
output_std_rw	DEF: Standard output, individual level	On	On	On	On	On	On	On
output_std_hh_rw	DEF: Standard output, household level	*Off*	*Off*	*Off*	*Off*	*Off*	*Off*	*Off*

Source: Authors' compilation based on the RWAMOD model.

2.3 Switches

By default, RWAMOD uses the national poverty line (RWF159,375 per year in 2014, uprated to relevant policy years using the overall CPI) to calculate headcount poverty rates. The model also contains an extension switch ('POV'), which allows the user to employ the extreme poverty line (RWF105,064 per year in 2014) for model simulations instead of the standard line. Both lines come from NISR (2018). The choice of poverty line only influences aggregate outcomes when examined directly within the EUROMOD software; users are free to analyse model output data to produce poverty estimates using alternative poverty lines.

3 Data

3.1 General information

The RWAMOD model uses data from the 2016/17 Fifth Integrated Household Living Conditions Survey (EICV5, or *Enquête Intégrale sur les Conditions de Vie des ménages* in French). EICV5 is the fifth national cross-sectional household survey conducted by the National Institute of Statistics in Rwanda, in collaboration with the World Bank, European Union, United Kingdom, United Nations Rwanda, and others. The database contains detailed information on demographic and household characteristics, expenditures, incomes, and social protection, which are used in the model, along with information on migration, health, environmental issues, and households' access to credits and savings.

The fifth EICV survey from 2016/17 is used as the underpinning dataset in the model because the most recent wave, EICV6 from 2020/21, was not fully implemented due to the COVID-19 pandemic. EICV6 includes data only on 40 percent of the intended household sample. Since 2010, the NISR has conducted EICV surveys every three years, meaning that the next survey will be conducted in 2023/24 and then incorporated into the RWAMOD model. EICV surveys prior to 2016/17 were conducted in 2000/01, 2005/06, 2010/11, and 2013/14.

For EICV5, data were collected for a 12-month period, from October 2016 to October 2017, from a total of 14,580 households. Income data were gathered in relation to the previous week or month or year before the first date of the interview. Table 3.1 describes the database. Information about the sampling and weighting procedures as well as variables is available from NISR (2021).

Table 3.1: RWAMOD database

Characteristic	Description
Name	Integrated Household Living Conditions Survey of Rwanda (EICV)
Provider	National Institute of Statistics in Rwanda (NISR)
Year of collection	2016/17
Period of collection	October 2016 to October 2017
Income reference period	July 2017
Sample size	64,314 individuals and 14,580 households
Response rate	100%
Type	Cross-sectional
Representation	Nationally representative

Source: Authors' construction based on information in NISR (2021).

Note that in order to compute nationally representative population-level estimates using the model, the outputs should always be analysed using the standard household-level survey weights from the EICV, which are retained in the model input and output data (variable *dwt*). These weights are also used when analysing model outputs directly in the modelling software (the Statistics Presenter tool in EUROMOD). The external validation tables in Section 4 similarly only contain population-level estimates that rely on the survey weights.

Based on SOUTHMOD Modelling Conventions, the survey weights are not adjusted based on demographic changes over time (i.e., for policy systems after the year of the baseline survey).

3.2 Data adjustments

3.2.1 General data adjustments

The EICV5 data are stored in separate files for each of the sections of the questionnaire. Consequently, the data compilation process involved the merging of 35 separate files on the various dimensions of demographic and socio-economic characteristics, using both the household identifier *(hhid)* and the person identifier *(pid)* to create an individual-level database. The database was constructed from the cross-sectional sample. There were no reasons to exclude any of the 14,580 households or the 64,314 individuals comprising them.

3.2.2 Income shocks resulting from the COVID-19 pandemic

RWAMOD uses data from the EICV survey conducted in 2016/17. This means that incomes in 2020–21 are not adjusted downwards automatically despite the labour market shock resulting from the COVID-19 pandemic. For the courtesy of the user, RWAMOD contains a definitional policy called *lma_rw,* which applies relevant shocks to incomes 'on-model' in 2020 and 2021. When the policy is set 'on' (default in the 2020 and 2021 policy systems), a portion of workers in each industry transition from paid employment to unemployment with no market income. Household consumption expenditures are adjusted downwards accordingly based on absolute reductions in disposable income (see Section 3.4).

The income adjustment is achieved by applying the 'transition shares' listed in Table 3.2 to randomly selected workers in each sector. The transition shares are derived from changes in each industry's GDP from its counterfactual values in 2020 and 2021, computed based on the pre-pandemic, 2017–19 linear trend (see Lastunen 2022 for details). GDP shocks are used as a proxy for average losses of market income in each sector. Specifically, it is assumed that the size of the proportional GDP shock in a given sector is equivalent to the share of workers who transition to unemployment with no market income. The reduction in output across the economy then approximates the loss of earned market income.

Table 3.2: Transition shares from paid employment to unemployment with no market income

Industry no. lindi01	Industry	Transition share, 2020	Transition share, 2021
1	Agriculture, Forestry, and Fishing	0.0420	0.0286
2	Mining and Quarrying	0.3250	0.1583
3	Manufacturing	0.0706	0.0629
4	Electricity, Gas and Air Conditioning Supply	0.0446	0
5	Water Supply, Gas, and Remediation Services	0	0
6	Construction	0.1499	0.1310
7	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	0.1468	0.1366
8	Transportation and Storage	0.3249	0.3053
9	Accommodation and Food Service Activities	0.4515	0.3859
10	Information and Communication	0	0
11	Financial and Insurance Activities	0.0951	0.0013
12	Real Estate Activities	0.0368	0.0347
13	Professional, Scientific, and Technical Activities	0.0902	0.0490
14	Administrative and Support Service Activities	0.1060	0.0882
15	Public Administration and Defence, Compulsory Social Security	0.0240	0.0472
16	Education	0.3936	0.0494
17	Human Health and Social Work Activities	0	0
18	Cultural, Domestic and Other Services	0.0831	0.0635

Source: Authors' elaboration of data from the National Accounts published by NISR (2022a).

Note that the GDP shocks capture not just the pandemic but also other industry-level economic developments that took place in 2020 and 2021 and deviated from pre-pandemic trends. Accordingly, the related labour market transitions and shocks apply to the entirety of years 2020 and 2021. Additional details of the derivation of GDP shocks (sectoral transition shares) and the modelling of income and consumption shocks are available in a separate technical note by Lastunen (2022). It is useful to emphasize that this particular method to modelling on-model shocks in RWAMOD is based on several assumptions, equivalent in all SOUTHMOD models, that the user is free to amend.[28]

As discussed in 3.1, individual-level survey data is likely to become available in 2025 that can be used to underpin the model, making it possible to account for any future external shocks without separate on-model adjustments.

3.3 Imputations and assumptions

3.3.1 Main imputations

Demographic variables

The *idpartner* variable was created from the EICV variable capturing the relationship of the household member to the household head. Specifically, the response of 'spouse' was used to generate the *idpartner* variable. The *idfather* and *idmother* variables were constructed from responses to three questions: (1) Is the biological father (mother) of (name) alive? If so, is he (she) living in this household? (2) What is the ID of the father (mother)? (3) What is the relationship to head of household? There were 4,880 children with no identifiable mother or father within the household and these were assigned to the head of household. If the head was female, then *idmother* was completed and assigned for that child; if the head was male, then *idfather* was completed and assigned to that child. The child heads of the nine child-headed households (aged between 14–17) and child spouses (aged 16 or 17) were not so assigned.

The 'post-secondary' category for current educational status *(dec* and *dec01)* could not be assigned as this education level was not recorded in the data. Moreover, imputations based on year of study were used to allocate cases to 'Masters' and 'Doctoral' tertiary levels in *dec01*.

No other adjustments to create demographic variables were required.

Labour market variables

No adjustments were needed to create labour market variables.

The simulation of personal income tax and certain social insurance contributions in RWAMOD have been restricted to those in formal employment by default (those for whom variable *lfo* is set equal to 1). A switch allows to simulate personal income taxes for all workers. In order to determine formality, questions 12 and 16 in Section 6 of the EICV survey were utilized. Question 12 determines whether or not the person is 'still working', while question 16 asks about the nature of the respondent's employment contract ('permanent worker', 'fixed-term contract', 'casual worker', 'seasonal worker', 'daily worker', or 'other'). Formal employees *(lfo=1)* were defined as those 'still working' who were either 'permanent workers' or those with a 'fixed-term contract'. Informal workers *(lfo=0)* were defined as those 'still working' but not 'permanent workers' or with a 'fixed-term contract'.

[28] Among other assumptions made in the current implementation of on-model shocks, only market income (yem, yse, and yag items that make up the 'earnings' income list) is reduced. Furthermore, farm income (yag) is only reduced for formal workers in the agricultural sector who have other sources of earnings (yem or yse). The user can change the related parameters or rely on alternative assumptions. Lastly, any positive shocks at the sector level are not taken into account.

Benefit variables

After examining the distribution of VUP Direct Support, a decision was taken to cap the associated benefit values at the 96th percentile, although these data are not used in the model as VUP Direct Support is simulated based on eligibility. No other adjustments to benefit variables were required.

Income variables

In addition to the need to gross up employee earnings, which were reported net of tax (see below), there were outliers of employee earnings and self-employment income which were capped at the 99th percentile. No other adjustments were needed to create income variables.

Negative incomes, for example, from agricultural and non-agricultural businesses are brought through to the model and are dealt with in policy *neg_rw* which sets the incomes to zero.

Expenditure and excise variables

Some adjustments were necessary to fuel expenditure, which involved capping petrol expenditure at the 99th percentile. Furthermore, as consumption quantities were not available when required for the purpose of calculating deducted excise duty, these had to be imputed using prices obtained from the World Bank (2022).

3.3.2 Gross incomes

Incomes from wages and salaries are reported net of personal income taxes in the 2016/17 EICV. The model in turn requires gross incomes in order to calculate personal income tax. Accordingly, it was necessary to impute gross incomes. This process involved the following steps:

1. Creating a temporary gross earned income variable initially equal to net income plus RWF100.
2. Computing income tax and employee social insurance contributions using the temporary gross income variable.
3. Adding the model-generated income tax and employee social insurance contributions to the original net income (thereby producing an imputed gross income) and comparing this to the temporary gross income.
4. If the difference exceeded RWF 100, the temporary gross income was incremented by RWF100 and the process was repeated. The process required approximately 2,800 iterations at which point the temporary gross income was within RWF 100 of recorded net income plus calculated tax plus employee social insurance contributions.

3.3.3 Disaggregation of harmonized variables

It was not necessary to disaggregate composite variables for the RWAMOD dataset.

3.4 Consumption levels

Consumption levels are based on the original reported consumption levels in the input data *(xhh)*. These levels are uprated from the base year to the policy year and adjusted by absolute changes in disposable income from the base year to the policy year.

The change in disposable income takes into account changes in market incomes (e.g., COVID-related decreases in earnings) as well as changes in benefits and social contributions. The underlying assumption is that changes in disposable incomes lead to the same changes in consumption levels. In recognition of the fact that there may be some consumption of own-account produced food, in cases where the base year disposable income is higher than the disposable income in the policy year, a proportion of the original consumption is assumed to be unaffected. This proportion is assumed to be 25 per cent of the original consumption following Tschirley et al. (2015).

3.5 Uprating

Uprating factors are used to account for any time inconsistencies between the input dataset and the policy year. Each monetary variable (i.e., each income component) is updated to account for changes in the non-simulated variables that have taken place between the year of the data and the year of the simulated tax–benefit system. Uprating factors are generally based on changes in the average value of an income component between the year of the data and the policy year.

The list of uprating factors as well as the sources used to derive them can be found in Table 3.3. Given that the financial year in Rwanda runs from 1 July to 30 June, a decision was made to uprate the model to a time point of July in each year and the uprating indices have been adjusted accordingly.

Table 3.3: Raw Indices for deriving RWAMOD uprating factors

	Constant name	2017	2018	2019	2020	2021	2022	2023
Overall CPI	$f_CPI_Overall	120.31	121.09	122.98	137.16	135.58	162.16	190.16
Food and Non-Alcoholic Beverages	$f_CPI_Food_NonAlcoholic_Beverages	133.34	125.78	126.53	148.47	143.28	190.11	245.58
Bread and Cereals	$f_CPI_Bread_Cereals	130.69	121.86	132.07	142.13	137.35	187.26	207.79
Meat	$f_CPI_Meat	113.25	116.23	133.94	154.87	163.20	192.16	216.95
Milk, Cheese and Eggs	$f_CPI_Milk_Cheese_Eggs	110.43	115.64	123.16	124.49	127.34	150.09	177.71
Vegetables	$f_CPI_Vegetables	144.00	132.02	126.39	163.41	145.91	199.24	291.09
Non-Alcoholic Beverages	$f_CPI_NonAlcoholic_Beverages	113.04	118.68	120.84	123.45	126.32	148.30	179.74
Alcoholic Beverages and Tobacco	$f_CPI_AlcoholicBeverages_Tobacco	118.89	120.77	123.37	152.48	157.92	174.03	201.63
Clothing and Footwear	$f_CPI_Clothing_Footwear	111.20	113.53	121.56	127.60	133.04	143.91	153.31
Housing, Water, Electricity, Gas, Other Fuels	$f_CPI_Housing_Water_Electricity_Gas_Fuels	107.76	119.80	121.30	124.51	127.82	140.10	146.12
Furnishing, Household Equipment and Maintenance	$f_CPI_Furnishing_HHEquipment_HHMaintenance	107.47	108.85	113.71	116.39	122.98	149.92	155.93
Health	$f_CPI_Health	106.55	106.51	107.01	107.21	107.49	109.60	111.1
Transport	$f_CPI_Transport	105.59	116.36	118.49	145.56	122.60	134.20	140.41
Communication	$f_CPI_Communication	102.99	102.47	102.47	102.46	102.46	103.84	104.08
Recreation and Culture	$f_CPI_Recreation_Culture	110.93	112.59	117.93	122.41	128.03	141.41	154.42
Education	$f_CPI_Education	129.39	133.32	136.06	139.55	147.29	157.09	178.91
Restaurants and Hotels	$f_CPI_Restaurants_Hotels	108.96	109.20	110.67	111.71	116.33	137.56	153.16
Miscellaneous Goods and Services	$f_CPI_Misc_Goods_Services	106.04	108.40	109.77	115.21	116.69	127.41	136.63

Note: CPI refers to the consumer price index. The base for each index is February 2014=100.

Source: Authors' compilation based on NISR (2022b).

4 Validation

RWAMOD results have been validated against external benchmarks where feasible. The main discrepancies between RWAMOD results and external benchmarks are discussed in the following sub-sections. Factors that may explain the observed differences are also briefly reviewed.

4.1 Population and labour force

As shown in Table 4.1, the total population estimates produced by RWAMOD are roughly in with external statistics from World Bank (2022). Note however that the total population or demographics in the model are not adjusted over time in line with the SOUTHMOD Modelling Conventions (UNU-WIDER 2024a). The focus of the modelling is on the effects of taxes and benefits and related changes in the income distribution, which population adjustments could obfuscate.

The total labour force in RWAMOD is slightly under-simulated compared to World Bank estimates (e.g., 4.1 million compared to 6.0 million in 2017). This is largely a result of differing definitions. In the survey data underpinning RWAMOD, for instance, all inactive individuals, students and pensioners are considered to be strictly outside of the labour force, which may not always be the case in labour force surveys used to produce the external estimates.

Lastly, the unemployment rate is slightly over-simulated (i.e., 2.7 per cent compared to 1.1 per cent suggested by the ILO modelled estimate in 2017). Note that the unemployment rate calculated in RWAMOD assumes that all self-reported work, including informal work such as subsistence farming, is considered employment. Information on the construction of the ILO modelled estimate of unemployment is not readily available but likely follows a similar definition and is hence broadly comparable to the RWAMOD estimate. The official estimates of the unemployment rate are much larger than these figures since they do not consider most varieties of informal work as employment.

The COVID-19 pandemic is visible in the estimated increase in unemployment in 2020 and 2021.

Table 4.1: Official and simulated population and labour statistics

	Simulation year						
	2017	2018	2019	2020	2021	2022	2023
RWAMOD							
Population	11.9	11.9	11.9	11.9	11.9	11.9	11.9
Labour force	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Unemployment rate	1.6	1.6	1.6	5.5	4.5	1.6	1.6
External statistics							
Population	12.0	12.3	12.6	13.0	13.3	13.8	14.1
Labour force	4.4	4.0	4.1	4.5	4.6	4.7	4.5
Unemployment rate	11.9	12.1	12.4	13.0	13.3	13.0	-
Ratios							
Population	0.99	0.97	0.94	0.92	0.89	0.86	0.84
Labour force	1.11	1.23	1.2	1.09	1.07	1.04	1.09
Unemployment rate	0.13	0.13	0.13	0.42	0.34	0.12	-

Notes: Population and labour force estimates are in millions. Ratios (RWAMOD/external) have been calculated before rounding the estimates. '-' reflects that no external data is available for the year in question.

Source: Authors' simulations using RWAMOD, which is underpinned by EICV data, and external statistics from World Bank (2022). The unemployment rate from external statistics is the ILO modelled estimate.

4.2 Consumption-based poverty and inequality

The consumption-based poverty and inequality measures presented here take as the starting point the national consumption aggregates provided by NISR. Building on these aggregates, the model produces outputs for the Statistics Presenter tool supplied with the model, which assume that for changes to taxes and benefits, there is a one-to-one income-to-consumption elasticity. This assumption is used for ease, convention and consistency across the SOUTHMOD models, but other elasticity assumptions could be made. Namely, the output data file can be imported into a statistical package such as Stata, R or SPSS and different elasticities applied. Similarly, by default the Statistics Presenter tool uses the national equivalence scale and national poverty lines, but if analysis of the output is undertaken within a statistical package, other poverty lines (e.g., int$1.90 per day) or equivalence scales (e.g., per capita or square root) can be applied.

Table 4.2 compares model and external estimates on poverty and inequality, both derived using consumption per adult equivalent. The consumption-based poverty rate estimated in RWAMOD for 2017 is 38.3 per cent, whereas that reported by World Bank for 2015/16 is 38.2 per cent. Analysis of the RWAMOD output data yields a Gini coefficient of 45.9 in 2017, whereas the World Bank estimate (again available for fiscal year 2015/16) is 43.7, using a scale of 0 to 100. The poverty and income distribution estimates from RWAMOD roughly correspond to the external estimates. Note also that the COVID-19 pandemic is visible in the estimated growth in poverty in 2020 and 2021.

Table 4.2: Official and simulated poverty rate and Gini coefficient

	Simulation year						
	2017	2018	2019	2020	2021	2022	2023
RWAMOD							
Poverty rate	37.7	37.7	37.7	40.6	39.8	37.9	37.9
Gini coefficient	45.7	45.7	45.7	45.8	45.7	45.6	45.6
External statistics							
Poverty rate	38.2	-	-	-	-	-	-
Gini coefficient	43.7	-	-	-	-	-	-
Ratios							
Poverty rate	0.99	-	-	-	-	-	-
Gini coefficient	1.05	-	-	-	-	-	-

Notes: Poverty rates refer to the headcount poverty rate, i.e., the share of the population whose real consumption falls below the national poverty line. Gini coefficients are in percentages. Ratios (RWAMOD/external) have been calculated before rounding the estimates. '-' reflects that no external data is available for the year in question.

Source: Authors' simulations using RWAMOD, which is underpinned by EICV data, and external statistics from World Bank (2022). The poverty rate and Gini coefficient from World Bank come from 2015/16 but are shown under 2017 for clarity.

4.3 Validation of simulated social benefits

In Table A3, RWAMOD estimates of social benefits and beneficiaries have been compared with those reported by the World Bank as well as RDRC, MINAGRI and FARG in Rwanda. Note that RWAMOD estimates of VUP Public Works salaries, RDRC, FARG and RSSB pension benefits, and receipt of a cow through the Girinka programme, have been carried out to the model directly from EICV data, as they cannot be simulated.

As evident in the table, under-simulation occurs especially with VUP Public Works salaries and participating households, RDRC benefits, FARG recipients, and RSSB pensions and beneficiaries. Most of the apparent discrepancies are associated with possible issues with the original survey data, namely the apparent under-reporting of benefit receipt. As for Girinka, the survey data only shows whether a given household has *ever* received a cow under the programme; not whether the cow was received specifically during the survey year. The resulting over-simulation of annual Girinka recipients has been addressed in RWAMOD by downwardly adjusting benefit receipt on-model based on external estimates (see Section 2.4 for details). This guarantees that the model estimates almost exactly match the external estimates provided by MINAGRI (2022).

Table 4.3: Official and simulated social assistance benefits and beneficiaries

	Simulation year						
	2017	2018	2019	2020	2021	2022	2023
RWAMOD							
VUP Direct household count	69.1	69.1	87.4	87.4	87.4	87.4	87.4
VUP Direct benefits	9.1	9.1	12.6	12.6	12.6	12.6	12.6
VUP CPW household count	42.3	42.3	42.3	42.3	42.3	42.3	42.3
VUP CPW benefits	2.5	2.5	2.5	2.8	2.8	3.4	3.9
VUP EPW household count	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VUP EPW benefits	0.1	0.1	0.1	0.1	0.1	0.1	0.1
RDRC benefits	0.3	0.3	0.4	0.4	0.4	0.5	0.5
Girinka household count	45.3	42.7	25.8	25.2	22.3	19.7	19.7
FARG household count	6.6	6.6	6.6	6.6	6.6	6.6	6.6
FARG benefits	3.8	3.8	3.9	4.3	4.2	5.1	6.0
RSSB pension recipient count	13.9	13.9	13.9	13.9	13.9	13.9	13.9
RSSB pension benefits	7.1	7.1	7.2	8.1	8.0	9.6	11.2
External statistics							
VUP Direct Support household count	95.4	101.7	113.8	119.4	121.4	-	-
VUP Direct Support benefits	11.9	14.3	15.9	16.8	17.2	-	-
VUP CPW household count	126.8	133.9	157.3	170.3	139	-	-
VUP CPW benefits	11.1	12.5	15.8	16.6	13.0	-	-
VUP EPW household count	7.9	21.4	35.9	50.2	79.3	-	-
VUP EPW benefits	0.8	1.9	3.3	5.2	7.8	-	-
RDRC benefits	-	-	-	2.9	-	-	-
Girinka household count	45.0	42.3	26.6	25.6	23.7	20.8	-
FARG household count	25.7	27.1	27.2	29.1	-	-	-
FARG benefits	2.8	2.9	3.6	4.4	-	-	-
RSSB pension recipient count	39.2	44	45.7	-	-	-	-
RSSB pension benefits	18.2	21.5	27.6	-	-	-	-
Ratios							
VUP Direct household count	0.72	0.68	0.77	0.73	0.72	-	-
VUP Direct benefits	0.76	0.64	0.79	0.75	0.73	-	-
VUP CPW household count	0.33	0.32	0.27	0.25	0.30	-	-
VUP CPW benefits	0.23	0.20	0.16	0.17	0.22	-	-
VUP EPW household count	0.13	0.05	0.03	0.02	0.01	-	-
VUP EPW benefits	0.13	0.05	0.03	0.02	0.01	-	-
RDRC benefits	-	-	-	0.14	-	-	-
Girinka household count	1.01	1.01	0.97	0.98	0.94	0.95	-
FARG household count	0.26	0.24	0.24	0.23	-	-	-
FARG benefits	1.36	1.31	1.08	0.98	-	-	-
RSSB pension recipient count	0.35	0.32	0.30	-	-	-	-
RSSB pension benefits	0.39	0.33	0.26	-	-	-	-

Notes: Estimates of the numbers of beneficiaries are in thousands. Benefit amounts are in RWF billions. Ratios (RWAMOD/external) have been calculated before rounding the estimates. '-' reflects that no external data is available for the year in question. When external data was only available for fiscal years, averages of two adjacent fiscal years were taken (e.g. the average of 2020/2021 and 2021/2022 data was calculated to get the 2021 value).

Source: Authors' simulations using RWAMOD, which is underpinned by EICV data, and external statistics from World Bank, RDRC, MINAGRI, FARG, and RSSB. Estimates for VUP programmes come from World Bank (2019); RDRC benefits from RDRC (2020); Girinka from MINAGRI (2022); FARG benefits from FARG (2022); and pensions from RSSB (2015, 2016, 2017, 2018, 2019).

4.3 Validation of simulated social security contributions

Table 4.4 compares the RWAMOD estimates of the social security contributions with corresponding figures reported by the RSSB. RWAMOD under-simulates total contributions by between 14–29 per cent in the years for which external data is available, with some differences between insurance schemes.

CBHI health contributions likely differ considerably from external statistics because the external data adds up payments also by members of Ubudehe category 1, which in the model, and in reality, are compensated by the government and not paid by the individuals themselves. All discrepancies will be further evaluated in future versions of the model.

Table 4.4: Official and simulated social insurance contributions

	Simulation year						
	2017	2018	2019	2020	2021	2022	2023
RWAMOD							
Total SIC contributions (pension, RAMA, CBHI, and maternity leave only)	117.5	118.2	120.0	114.4	124.4	156.8	183.0
Pension scheme contributions	51.3	51.7	52.5	50.0	53.3	69.2	81.2
RAMA medical contributions	56.4	56.7	57.6	55.0	61.4	76.0	89.1
CBHI health contributions	4.6	4.6	4.6	4.4	4.4	4.6	4.6
Maternity leave contributions	5.1	5.2	5.2	5.0	5.3	6.9	8.1
External statistics							
Total SIC contributions (pension, RAMA, CBHI, and maternity leave only)	137.1	152.6	168.5	-	-	-	-
Pensions scheme contributions	74.9	83.3	94.4	-	-	-	-
RAMA medical contributions	38.9	42.2	46.4	-	-	-	-
CBHI health contributions	19.9	21.0	20.9	-	-	-	-
Maternity leave contributions	3.4	6.1	6.8	-	-	-	-
Ratios							
Total SIC contributions (pension, RAMA, CBHI, and maternity leave only)	0.86	0.77	0.71	-	-	-	-
Pensions scheme contributions	0.68	0.62	0.56	-	-	-	-
RAMA medical contributions	1.45	1.34	1.24	-	-	-	-
CBHI health contributions	0.23	0.22	0.22	-	-	-	-
Maternity leave contributions	1.50	0.85	0.76	-	-	-	-

Notes: Contribution estimates are in RWF billions. Ratios (RWAMOD/external) have been calculated before rounding the estimates. RWAMOD also simulates other social insurance contributions that are not shown here as the corresponding estimates are not readily available in external data (occupation hazard insurance and Military Medical Insurance, MMI). '-' reflects that no external data is available for the year in question.

Source: Authors' simulations using RWAMOD, which is underpinned by EICV data, and external statistics from RSSB (2015; 2016; 2017; 2018; 2019), including pension, medical (RAMA), health (CBHI) and maternity leave contributions by employees and employers.

4.3 Validation of simulated taxes

Finally, Table 4.5 compares the RWAMOD-simulated tax revenue with figures from the RRA and OECD. Income and turnover tax revenue in RWAMOD are roughly in line with external estimates. VAT, excise duty and rental tax revenue in turn are under-simulated.

Some explanations for the under-simulation of indirect taxes include the following:

- The external statistics cover all VAT revenue, whereas RWAMOD models VAT payments made by households. VAT produced by RWAMOD is expected to be lower than that reported by RRA simply because there are many cases where the value-added chain ends before the purchase of a good or service by households, for whom it is exempt.
- Relatedly, as with most household surveys, wealthier households whose consumption is expected to be larger are generally underrepresented; this is evident for instance in the under-representation of Ubudehe 3 and 4 category households in the survey data.

- There are some excise duties that cannot be fully modelled in RWAMOD because of limitations in the household survey.
- VAT and excise duties are reported by RRA on a 'cash flow' basis rather than an 'accrual' basis as in the model, which may also play a role in explaining the discrepancies.
- VAT and excise duties paid by foreigners are not included in RWAMOD, as EICV only covers Rwandan citizens.

Note that the simulation of these indirect taxes is still helpful, as they provide valuable insights on the impact and incidence of these taxes and their changes at individual level.

All discrepancies will be further evaluated in future versions of the model.

Table 4.5: Official and simulated tax revenue

	Simulation year						
	2017	2018	2019	2020	2021	2022	2023
RWAMOD							
Income tax revenue	310.6	312.9	319.3	322.3	330.7	457.8	536.8
Turnover tax revenue	24.2	24.6	24.9	28.9	28.5	34.3	40.7
VAT revenue	206.2	209.0	216.7	236.0	233.0	276.1	312.6
Excise duty revenue	25.1	25.5	25.8	29.4	29.8	32.2	35.7
Rental tax revenue	5.7	5.8	5.9	6.9	6.8	8.6	10.6
External statistics							
Income tax revenue	277.3	311.7	353.4	361.5	-	-	-
Turnover tax revenue	20.9	27.7	32.9	31.9	-	-	-
VAT revenue	386.5	422.9	507.7	486.0	562.4	-	-
Excise duty revenue	138.2	158.7	172.3	176.5	211.9	-	-
Rental tax revenue	10.8	11.3	11.5	-	-	-	-
Ratios							
Income tax revenue	1.12	1.00	0.9	0.89	-	-	-
Turnover tax revenue	1.16	0.89	0.76	0.91	-	-	-
VAT revenue	0.53	0.49	0.43	0.49	0.41	-	-
Excise duty revenue	0.18	0.16	0.15	0.17	0.14	-	-
Rental tax revenue	0.53	0.51	0.51	-	-	-	-

Notes: Tax revenue estimates are in RWF billions. Ratios (RWAMOD/external) have been calculated before rounding the estimates. '-' reflects that no external data is available for the year in question.

Source: Authors' simulations using RWAMOD, which is underpinned by EICV data, and external statistics from RRA (2022) and OECD (2021), including estimates for income tax, turnover tax ('corporate tax' for SMEs), VAT, and excise tax.

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