

F Botswana

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F.1 Introduction

Botswana's National Accounts are compiled according to the 2008 System of National Accounts (2008 SNA) framework and International Standard Industrial Classification Rev 4.

GTAP flows were prepared using data from Botswana 2016 SUT file. Output, Imports, Import taxes, Margins and Other taxes were prepared to match with the use table. Ratios from the product flows at basic prices were used to split the data among the use table variables.

The source table was product by industry presented in millions of Botswana Pula. The source table was valued at purchaser's prices. The structure of the source table was consistent with GTAP sectors except for sectors not produced in Botswana.

F.2 Units

Figures are in Millions of Botswana Pula (BWP).

F.3 Base Year

Base year used in the Supply and Use Table is 2016. Updated from the old base year of 2006.

F.4 Output

Includes domestic production by three types of output being Market output, Non market output and Output for own final use at basic prices. Total output was allocated to final uses using derived ratios from product flows at basic prices.

F.5 Imports

Detailed quarterly data on exports and imports of goods are available, classified by Harmonised system (HS) and Broad Economic Category (BEC). The balance of payments provides data on foreign trade in services. The totals are the same as the totals reported in the balance of payments.

F.6 Import taxes

This are taxes levied on Non-SACU (South African Customs Union) imports in terms of GDP compilation.

F.7 Trade Margins

Mini survey was conducted on large wholesale and retailers to derive the margins structure.

F.8 Other Taxes and Subsidies

Comprises of all excise duties collected within the borders e.g. alcohol levy, alcohol & tobacco duties, Electricity levy, Fuel levy and duties on motor vehicles imports. Subsidies were only recorded under electricity product.

F.9 Value Added Tax (VAT)

VAT is a consumption tax that is levied on products at each stage of the production process – from labour and raw materials to the sale of the final product. The entire VAT is ultimately passed to the final buyer(s), as consumers at the previous stages of purchase are reimbursed for the VAT they've paid. The final user pays the entire sum of the VAT paid by the other buyers at prior stages. Final buyers are mainly households, but producers that are not registered for VAT are also included.

F.10 GDP compiled by the Expenditure Approach

Final consumption expenditure by government

Individual consumption comprises government education and health, while collective consumption includes the central bank, public administration and local government. Final consumption is calculated as output minus sales and fees.

Final consumption expenditure by households

The benchmark estimate is based on the product flows and records consumption by COICOP 2-digit level. The results of the Botswana Multi Topic Household Survey (BMTHS) were tested and used in compiling Household final consumption.

Gross fixed capital formation

The benchmark estimate is based on the product flows and records consumption by type of capital asset. Estimates are also based on government capital expenditure. The annual and quarterly estimates are based on supply indicators by type of asset: buildings and structures; transport equipment; machinery and other equipment; and mineral exploration.

Changes in inventories

The estimates are not comprehensive as only livestock and minerals are included. Quarterly data on inventories (quantities and values) of minerals are available from major producers including diamond traders.

GTAP AGGREGATED FLOWS

The Botswana GTAP aggregated flows consists of 35 sectors. The SUT table was converted to Input Output Table (IOT) of 35 by 35 sectors, product by product. Table SSET SMAP in the GTAP Unified format shows the 35 sectors and their concordance with products and industries in the Botswana SUT.

Output Matrix

The square matrix is a product by industry. The industry output consists of secondary output products which lead to discrepancies between total product sales and total costs of the producing industry.

The errors were due to secondary outputs recorded by some industries in the SUT. When the table was converted to product by product, the errors were eliminated.

Secondary outputs were deducted from industries totals and allocated to their respective products accordingly. The secondary output from the output matrix was multiplied by UF or UP values for each product in the matrix divided by the total output from UF and UP tables respectively. Total product values were derived by deducting the calculated UF and UP values from the original industry values. The affected columns were replaced by derived total product values.

The product technology assumption was applied. For example, the cost structure for the real estate industry was applied for secondary output of real estate services. However, there are two exceptions: the secondary of a) meat products in the livestock sector and, b) of hides and skins in the meat industry was moved with the input structure of the industry where produced.

There is no domestic production of certain products in our economy e.g. Paddy rice, Extraction of crude oil, Extraction of natural gas, Sugar cane, sugar beet, Plant-based fibers and

Water transport. Sector aggregations were done according to mandatory splits. Contributed tables use the GSC3 with aggregation thereof. The classification is the disaggregation of the 3 mandatory splits (afp, eng and oth). The classification distinguishes at least 30 sectors as proposed in the GTAP Technical Paper No. 1, Release 5 of January 2022.

GTAP Unified Table

Consists of UF, UP, OP MF and SSET SMAP.

UF

This is a product by product matrix of domestic and imported products. Imports stacked together with domestic production. The products values were derived from GTAP aggregated input matrix. Total supply is aggregated output from product flows. Total uses is the intermediate consumption plus components of final demand from GTAP aggregated flows. Note that, there is no domestic production for petroleum products. All petroleum products are imported. Botswana imports more diamonds from DeBeers group companies located in Canada, South Africa and Namibia for aggregation before exporting the commodity.

UP

Consists of product by product matrix. UP equal UF plus other taxes of domestic products and other taxes for imported products. Other taxes includes Value Added Tax (VAT) and other taxes collected within Botswana borders including subsidies paid. Recorded subsidies are for electricity product only in the Botswana SUT file.

Mixed income

Mixed income consists of labour compensation and capital. The 2015/16 Botswana Multi Topic Household Survey (BMTHS) had a module of household enterprises. The data was analysed to derive production account estimates and labour compensation. Mixed income for some products supplied by household enterprises were derived from the above which is value added minus Compensation of employees.

Assumed labour part of mixed income was added to labour and capital derived as a residual. The sectors dominated by small family firms are generally not very capital intensive. In sectors dominated by this type of firms, the share of capital was assumed between 10% and 30% maximum e.g. Crop production & horticulture, Livestock production, Forestry and Fishing.

On the other hand, the sectors dominated by large modern firms are generally capital intensive and the share was assumed between 50% and above.

Real Estate activities took a larger share of capital. There is no labour share for Ownership of Dwellings, all is capital. The market dwellings are included in the Real Estate Activities. This is in line with SNA definitions for owner-occupied dwellings

F.11 BOTSWANA SUT DOCUMENTATION

Notes of the SUT

SNA recommends the compilation of a Supply and Use Table (SUT) as a first step in National Accounts preparations because they generate consistent estimates of GDP compiled by the production and expenditure approaches.

Botswana SUT has been compiled for the year 2016, the base year for the first time in Botswana and provides benchmark estimates for the base year. The SUT is compiled at purchasers' prices with 98 products and 58 industries in the columns.

The SUT includes three components:

- a Product flows with total intermediate consumption on the uses side. The flows were made to balance, in some cases with intermediate consumption calculated as residual. Changes in inventories are only estimated for livestock and minerals.
- b The output matrix. It was not possible to estimate secondary output comprehensively and, therefore, output was assumed to include only products typically produced by an industry.
- c The input matrix. The sum of intermediate consumption across the rows of the matrix is normally not equal to intermediate consumption as estimated in the product flows, i.e. there is a discrepancy.

The balancing of the SUT eliminates the discrepancy in two steps:

- Manual adjustments and corrections mostly by reallocation of products in the input matrix, but also by modifications in the product flows.
- Remaining discrepancies were eliminated in a reiterative process. This resulted in small changes of total intermediate consumption by industry, in most cases less than two percent.

The SUT is based on detailed data which were provided by intermittent surveys and other sources including:

- The 2016 Census of Enterprises and Establishments (CEE) included detailed data for the SUT, crucially data on the input structures.

- The 2015/16 Botswana Multi-Topic Household Survey (BMHTS) included detailed data on house–hold consumption, data on household businesses (the informal sector) and data on Agriculture operated by households.
- Detailed data on revenue and expenditure by Central and Local Government including Extra-Budgetary Accounts (Parastatals). The latter were not properly included in the previous estimates.
- Mini surveys of Manufacturing, Construction, Trade Margins and Road transport.
- Foreign trade data classified by Broad Economic Categories (BEC) are useful for the allocation of uses in the product flow.

Industries source data

1. Agriculture, Forestry and Fishing

Agriculture is divided into four (4) industries:

- a Crop farming & horticulture
- b Livestock farming
- c Fishing, Forestry & logging
- d Support services to agriculture, hunting, forestry and fishing. Support services is mainly agricultural activities on a fee or contract basis e.g. preparation of fields, crop spraying, trimming of fruit trees, pest control, operation of agricultural irrigation equipment, activities related to artificial insemination etc..

Crop Farming

Based on harvested quantities valued by producer prices from Botswana Agricultural Marketing Board (BAMB). Output for own consumption based on Botswana Multi Topic Household Survey (BMHTS), Agriculture module.

Livestock farming

Cattle sold for slaughter/Sale of live animals: Based on slaughters by Botswana Meat Commission (BMC) and slaughters in Municipal Abattoirs. Goats and Sheep based on BMHTS Agriculture module and slaughters from municipal abattoirs. Other animals and Agricultural products based on BMHTS Agric. Module and BMHTS household consumption.

Forestry and Fishing

Based on BMHTS: consumption of firewood and household enterprise module (fishing).

Support services to Agriculture

Benchmark estimates from Corporations based on 2016 CEE. Household enterprises from BMTHS Enterprises module and Agriculture module

2. Mining and Quarrying

Mining compiled by seven (7) industries:

- a Mining of diamonds
- b Mining of coal
- c Mining of copper/Nickel
- d Mining of gold
- e Mining of soda ash & salt
- f Other mining & quarrying
- g Mining support service activities :-Includes support services on a fee or contract basis, exploration services, draining and pumping services, test drilling and test hole boring.

Benchmark and time series estimates based on income statements and detailed company data used for SUT compilation (Coal, Diamond, Soda Ash & Salt, and Copper/Nickel minerals).

Other Mining & Quarrying and Mining Support Service Activities derived from 2016 Census of Enterprise and Establishment survey (CEE).

3. Manufacturing

Manufacturing is compiled by fifteen (15) industries.

- a Production, processing and preserving of meat and meat products.
- b Manufacture of dairy products
- c Manufacture of grain mill and animal feed products
- d Manufacture of bakery products
- e Manufacture of other food products (includes processing and preserving of fish, processing and preserving of fruit & vegetables, manufacture of vegetables & animal oils and fats, manufacture of sugar and manufacture of cocoa, chocolate and sugar confectionery).
- f Manufacture of beverages and tobacco
- g Manufacture of textiles, clothing and leather products

- h Manufacture of wood, paper and products thereof
- i Printing and reproduction of recorded media
- j Manufacture of chemicals, chemical, pharmaceutical, rubber and products (includes manufacture of chemicals and products, manufacturing of fertilizers, manufacture of plastics, manufacture of pesticides, manufacture of paints, vanishes & similar coatings, manufacture of soaps, detergents, polishing and perfumes).
- k Manufacture of non-metallic mineral products (includes manufacture of glass & glass products, manufacture of clay building materials, manufacture of other porcelain & ceramic products, manufacture of cement and manufacture of articles of concrete, cement and plaster).
- l Manufacture of basic metals and metal products (includes manufacture of basic iron & steel, manufacture of basic precious & other non-ferrous metals, casting of no-ferrous metals, manufacture of structural metal products, manufacture of tanks, reservoirs and containers of metal, Forging, pressing, stamping and roll-forming of metal, Treatment & coating of metals, manufacture of cutlery, hand tools & general hardware).
- m Manufacture and repair of machinery & equipment and transport equipment (includes manufacture of computer, electronic & optical products, manufacture of electrical equipment, manufacture of machinery & equipment, manufacture of motor vehicles, trailers and semi-trailers and manufacture of other transport equipment).
- n Diamond cutting, polishing and setting
- o Manufacture of furniture

The main source data is the 2016 CEE and Household enterprises module (BMHTS) used to estimate the activity of household businesses.

4. Electricity Supply

Benchmark and time series estimates derived from detailed data from Botswana Power Corporation (BPC): Income statements and monthly data on sales and expenses.

5. Water Supply; Sewerage; Waste Collection

Estimates are based on income statements from Water provider being Water Utilities Corporation (WUC); Waste collection based on 2016 CEE information.

6. Construction

Includes construction of buildings, civil engineering and specialised construction activities (site preparations, electrical installation, plumbing, heat and air conditioning). Based on 2016 CEE data and household enterprises of BMTHS plus mini survey results.

7. Wholesale and retail trade; repair of motor vehicles and motorcycles

It includes general retailers & wholesalers, Petrol stations, garages maintaining vehicles and sales of motor vehicles businesses. Mini survey was conducted in order to collect detailed product margin data for SUTs compilation. Derived based on 2016 CEE data and Household enterprise module of BMHTS plus mini survey (margins).

8. Diamond Trading

Based on detailed quarterly and annual data from DeBeers Botswana Global Sight holders Sales (DBGSSS), Okavango Diamond Company (ODC) and Diamond Trading Company Botswana (DTCB).

9. Transport and Storage

Transport industry is compiled by five (5) industries.

- a Rail Transport (consist of passenger and freight rail)
- b Road transport (Passenger and freight road transport including combis, taxis, cabs)
- c Air transport (consists of Air Botswana and other air transport services providers)
- d Postal and Courier Services
- e Storage and Transport Support Services (includes warehousing & storage activities, service activities incidental to land, water and air transportation).

Income statements data used for Rail, Air Transport and Botswana Post. Road transport derived basing on 2016 CEE data and household enterprises plus mini survey data on Combis, Taxis and Cabs. Storage & Transport support services and Courier activities were derived from the CEE survey data.

10. Accommodation and Food Services

The information used to compile Accommodation value added was collected from Hotels, Lodges, Guest houses and Camping grounds.

Food Services includes activities of Restaurants, Cafeterias, Fast-food restaurants, Pizza delivery, mobile food carts, food preparation in market stalls etc..

Estimates derived through the 2016 CEE survey data and Enterprise module of BMHTS to augment the output of Food and Beverage Service Activity.

11. Information Communication and Technology (ICT)

ICT industry is compiled by four (4) industries.

- a Publishing including motion picture, etc. and printed matter (includes Publishing & print media, Book publishing, Publishing of newspapers, journals, Motion picture, video and TV programme activities, Sound recording and music publishing activities).

- b Radio and Television broadcasting
- c Telecommunications (includes wired telecommunication activities, wireless telecommunications activities, satellite telecommunications activities).
- d Computer Programming and Information Services Activities.

Income statements from Mascom, Orange, Botswana Telecommunication Corporation (BTC) and Multi Choice were used and other activities were compiled from the 2016 CEE data.

12. Central Banking

The industry includes issuing and managing the country's currency. Monitoring and control of the money supply, supervising banking operations, holding the country's international reserves, acting as a banker to the Government.

Based on detailed data from Bank of Botswana. The output derived as sum of costs: Compensation of Employees (COE) and Intermediate Consumption (IC).

13. Monetary Intermediation and Financial Services

The industry includes the receiving of deposits and extending of credit or lending funds. The granting of credit can take a variety of forms such as loans, mortgages, credit cards etc. mainly done by commercial banks. Other credit granting activities primarily concerned with issuing of loans by institutions not involved in monetary intermediation e.g. micro lenders, pawnshops etc.

Detailed data from Commercial banks, Botswana Building Society (BBS), Botswana Savings Bank was used to derive output which comprises of Financial Intermediaries Services Indirectly Measured (FISIM) and direct charges. Non-Banking enterprises based on 2016 CEE.

14. Insurance and pension funding

The industry comprises of Life insurance, Non-life insurance, Reinsurance and Pension funding.

Data from Non-Bank Financial Institutions Regulatory Authority (NBFIRA) was used to derive the output.

15. Financial Insurance Auxiliary Services Activities

It includes Administration of financial markets e.g. Security exchanges, Stock exchanges, Activities of Insurance Agents and Brokers, Other Activities Auxiliary to Financial Service Activities, Fund Management Activities.

Output is based on 2016 CEE information and data from Botswana Stock Exchange.

16. Owner-Occupied Dwellings

Households that own the dwellings they occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households. When

well-organised markets for rented housing exist, the output of own-account housing services can be valued using the prices of the same kinds of services sold on the market.

Benchmark estimate based on BMTHS; Output on the housing module, Intermediate Consumption (IC) on consumption module.

17. Real Estate Activities

The industry includes buying, selling, renting, and operation of self-owned or leased real estate, such as apartment building and dwelling, Non-residential building, including exhibition halls, self-storage facilities, malls, shopping centres etc.

Output derived from 2016 CEE and Household enterprises of BMTHS plus information from Housing module of BMTHS to derive output of rented dwellings.

18. Professional, Scientific and Technical Activities

Includes Legal activities, Accounting, Bookkeeping & Auditing activities, Management consultancy activities, Architectural & engineering services, Research & experimental development, Advertising & marketing, specialised design and photographic activities and Veterinary activities.

Compiled basing on the data from 2016 CEE and BMTHS Household enterprises module.

19. Travel Agencies, Tour Operators and Related Activities

Includes Travel agency activities, Tour operator's activities and Other Reservation Service and Related Activities.

Benchmark estimates compiled from the 2016 CEE information.

20. Other Administrative and Support Service Activities

Comprises of Renting activities (renting and leasing of vehicles, renting of machinery and equipment, renting of personal and household goods etc.), Employment and Human Resource Activities, Private security and investigation activities, Cleaning and landscaping services, Business support activities.

Output derived from 2016 CEE data and Household module of BMTHS.

21. Public Administration; Central Government

Government units are set by means of political process. They organise and finance the provision of goods and services to individual households and the community at large. Also concerned with the distribution and redistribution of income and wealth.

Detailed data on Government Expenditure and Revenue; income statements from Parastatals used in estimating the output of the industry. Output derived as Sum of Costs approach.

22. Local Government Activities

Detailed data on expenditure and revenues from Councils and Land boards used.

23. Education

Includes both public and private education activities e.g. pre-primary & primary education, General secondary education, Technical & vocational secondary education, Higher education etc.

Government Schools: Detailed data on Government Expenditure and revenue plus Education expenditure by Councils. Universities (Parastatals): Income Statements Private Schools: Based on 2016 CEE information

24. Human Health and Social Work Activities

Includes both public & private health and social work activities e.g. Hospital activities, medical & dental practice activities, human health activities.

Government Health: Detailed data on Government Expenditure and revenue. Private Health: Based on 2016 CEE and BMTHS enterprise module.

25. Arts, Entertainment and Recreation

Includes Creative, Arts and Entertainment Activities, Library, Archives, Museums and Other Cultural Activities, Gambling and Betting Activities, Sporting Activities and Amusement and Recreational Activities.

Output derived from 2016 CEE data and Enterprise module of BMTHS.

26. Activities of Membership Organisation

Includes Activities of Business and Employers Membership Organizations, Activities of Professional Membership Organizations, Activities of Trade Unions, Activities of Religious Organizations and Activities of Political Organizations.

Benchmark estimates derived from the 2016 CEE information.

27. Other Services

Comprises of Repair of Computers and Personal and Household Goods (Repair of Computers and Peripheral Equipment, Repair of Communication Equipment, Repair of Footwear and Leather Goods, Repair of Furniture and Home Furnishings, Other Personal Service Activities (Washing and Dry-Cleaning of Textiles and Fur Products, Hairdressing and Other Beauty Treatment, Funeral and Related Activities), Activities of Households as Employers of Domestic Personnel.

Based on 2016 CEE data and Enterprise & Consumption modules of BMTHS.

References

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