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# AFGHANISTAN FISCAL SUSTAINABILITY MODEL

## SUMMARY REPORT

**SEPTEMBER 2011**

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## ACRONYMS

ANDS	Afghanistan National Development Strategy
DFID	Department for International Development (U.K.)
GDP	gross domestic product
MoF	Ministry of Finance
MTFF	medium-term fiscal framework
O&M	operations and maintenance

## OVERVIEW AND BACKGROUND

Under a contact with FSSHARE/USAID and, more recently, the U.S. Treasury, and with general support from Adam Smith International/DFID, a fiscal sustainability model was developed to help both U.S. and Afghan government officials analyze some crucial issues as part of the lead-up to 2014 transition/transformation and thereafter. The fiscal model presented in this note is meant to help policy analysts look at a variety of fiscal issues. However, it should be kept in mind that the model is a work in progress. Over time, the model should incorporate some ongoing detailed analysis that others have undertaken. This could include:

- Improved cost estimates for future and unbudgeted operations and maintenance (O&M) associated with donor projects, security costs, and Afghan nationals who are performing government functions but paid by donors
- The likely gross domestic product (GDP), price, and exchange rate developments resulting from the transition/transformation and their effects on revenues and expenditures
- The implications of new revenue initiatives

Some of these issues are analyzed in this note through simulations.

The basis and properties of the current version of the model are presented in Section I. Section II includes some illustrative simulations and provides some insight into the value of the model for policy analysis. Section III includes a discussion of possible model enhancements and extensions and the challenges that U.S. and Afghanistan government officials may face in using and supporting the model.

After presenting the government's medium-term fiscal framework (MTFF), an alternative and more realistic baseline is presented. Next, scenarios are presented that examine key issues that are likely to be relevant during the transition. The simulations show that the potential fiscal costs of O&M are substantial. When combined with the alternative baseline and the likely negative output effects of the transition, the fiscal situation is potentially untenable if the government absorbs all of the O&M costs. Addressing the fiscal situation will require a shared-strategy of the government and the donors.

## SECTION I. THE AFGHANISTAN FISCAL MODEL

The genesis of the Afghanistan Fiscal Model developed in this note started with the MTFF of the Fiscal Policy Unit in Afghanistan's Ministry of Finance (MoF). The Fiscal Policy Unit's MTFF was implicit in its revenue and expenditure Excel files. The revenue file was well-organized and easy to use. Individual revenue items were determined from growth in key exogenous variables, including domestic and world real and nominal growth and revenue efficiency. In contrast, the expenditure file was extremely complicated and lacked consistency. The first part of this project was to simplify and improve the expenditure Excel file. Once this was accomplished the basic structure of the spreadsheets was converted into Eviews to make the model more manageable and facilitate scenario analysis.

The model is large (more than 800 equations) but its structure is not very complicated as it contains only a few underlying basic behavioral specifications and very few simultaneous relationships. The model mnemonics and a description of the model equations are presented in Annex A. The nearly 200 revenue equations are determined by growth in several key variables; operating expenditures for every ministry/spending agency<sup>1</sup> are based on underlying growth assumptions for the four economic spending areas (compensation, goods, transfers, and operating budget capital). Core budget development spending is earmarked and/or unallocated funds are shared between ministries based on historical development spending patterns. The model structure allows for the underlying relationship for any expenditure or revenue item to be overridden by special considerations (e.g., wages and goods in the security sector — Ministries of Interior and Defense — as a result of agreements with donors). In addition to the determination of every budgeted revenue and expenditure item, estimates are added for potential O&M by aggregating and cumulating a heavily discounted value of on- and off-budget capital and development spending for every ministry and applying an assumed O&M rate. Finally, there are a large number of definitions and identities. In particular the model contains equations for:

1. Every revenue item in the chart of accounts — 190 equations
2. Aggregating revenue into key types — 28 equations
3. Compensation (code 21), goods (code 22), transfers (code 24), and operating budget capital (code 25) for each ministry/spending agency, plus interest for the MoF (code 23) — 221 equations (four codes, 55 spending agencies)
4. Aggregating expenditures into economic classifications, ministry spending, and Afghanistan National Development Strategy (ANDS) sectors — 71 equations
5. Core budget development spending for each spending agency — 59 equations

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<sup>1</sup> In this note, the terms *ministry* and *spending agency* are used interchangeably. In most cases the ministry is the spending agency, but in several examples a unit is given spending authority but is not a ministry (e.g., the municipality of Kabul).

6. Investment, capital accumulation, and estimated O&M for every ministry — 180 equations
7. Definitions of fiscal balances, with and without grants, key variables relative to GDP and/or shares, ANDS aggregations — 120 equations

While the underlying model specification is relatively simple, the advantage of an approach that includes detailed expenditures, revenues and aggregations is that it allows policy analysts to look at a wider variety of questions and to target key variables in simulations (e.g., fiscal balance).

A separate manual was developed to take users through the data creation and model solving in Eviews; the manual concludes with a few examples of how to run simulations. Eviews programs were written in a way that reduces the need to understand Eviews. While these programs look somewhat daunting, they are designed to simplify the simulations, as they require only a few simple changes to tailor the simulations to meet a user's needs. It should take somewhere between two and five full days for anyone unacquainted with Eviews to feel comfortable using the tool and running the model.

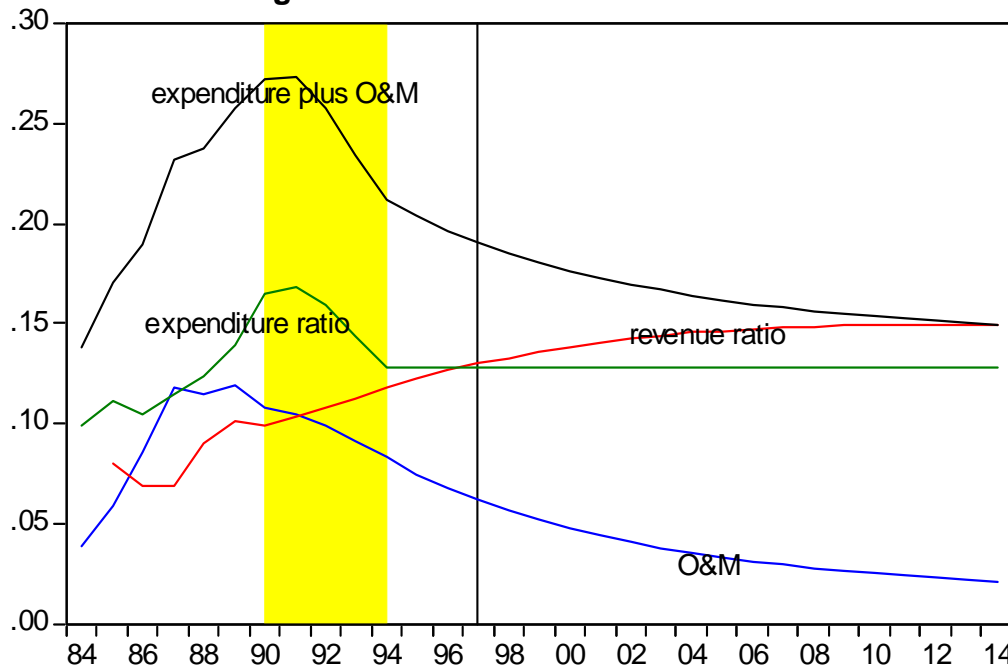
## SECTION II. SIMULATIONS TO ANALYZE POLICY ISSUES

The model was developed to examine fiscal policy issues. This section shows how the model can be used to analyze several policy issues. The basis for most of this analysis centers on “transition/transformation” issues. First, the model is used to provide a baseline forecast. Then it is simulated to look at a more realistic baseline while pointing to a number of key transitional issues that raise significant policy concerns.

### A. Simulating the Baseline

The baseline forecast starts with the government’s MTFF through 1394. After 1394, data are forecasted, assuming that exogenous nominal values increase at the same rate as in 1394, revenue efficiency declines slowly toward zero, core budget grants continue to grow (but at a slow rate), operating expenditures grow with nominal income, and revenues increase according to their behavioral equations. External grants — which are not part of the budget — fall by 25 percent per year through 1394 and then are assumed to be constant.<sup>2</sup> Figure 1 presents several key variables.

**Figure 1. MTFF Baseline Simulation**



Note that in the MoF MTFF baseline, operating expenditures drop from 1390 to 1994 by 5 percent of GDP while revenue increases by about same amount. The break-even point is 1397. If O&M estimates are included, it will take 20 years to balance the budget. It is worrisome that this scenario uses unrealistic operating expenditure assumptions.

<sup>2</sup> The combined effect of external grants falling and core budget grants increasing slowly is consistent with an overall decline in grants but with donors putting more of their financing through the budget.

The O&M in this scenario is only a potential level of O&M; it is discussed in Section I and later in this section.

*Policy implications.* These assumptions produce an unrealistic baseline through 1394. Except for an agreement with donors that the operating budget will fund compensation and food for the security sector, all other spending is either unchanged in nominal terms (compensation, transfers, and operating budget capital) or assumed to grow very slowly (goods at about half the rate of inflation). Together with continuing strong growth in revenue because of tax efficiency, this produces an operating budget surplus. In particular, revenue grows slightly faster than GDP while expenditures decline as a share of output since they are unchanged in nominal terms. These assumptions are clearly unrealistic. It is also a potentially dangerous baseline from the perspective of political economy. It implies that the government has room to absorb expenditures that are currently financed by donors and/or the operational expenditures of donor-built capital. In reality, the government will have difficulty financing its current operating expenditures under plausible assumptions.

Furthermore this baseline is missing a number of key concerns:

1. Realistic operating budget in the MTFF
2. O&M associated with capital projects (shown in Figure 1)
3. Non-personal security costs
4. Second civil service (donor-funded local staff)
5. Likely decline in output associated with the transition and resulting revenue decline

The next set of model scenarios examines some of these issues.

## **B. Toward a More Realistic Baseline**

In this scenario, the unrealistic assumptions regarding the operating budget are altered. In particular, non-security operating expenditures are assumed to grow in line with nominal GDP, which is somewhat below past behavior. Under these assumptions, the relative rise in revenue is not sufficient to balance the operating budget (excluding grants).

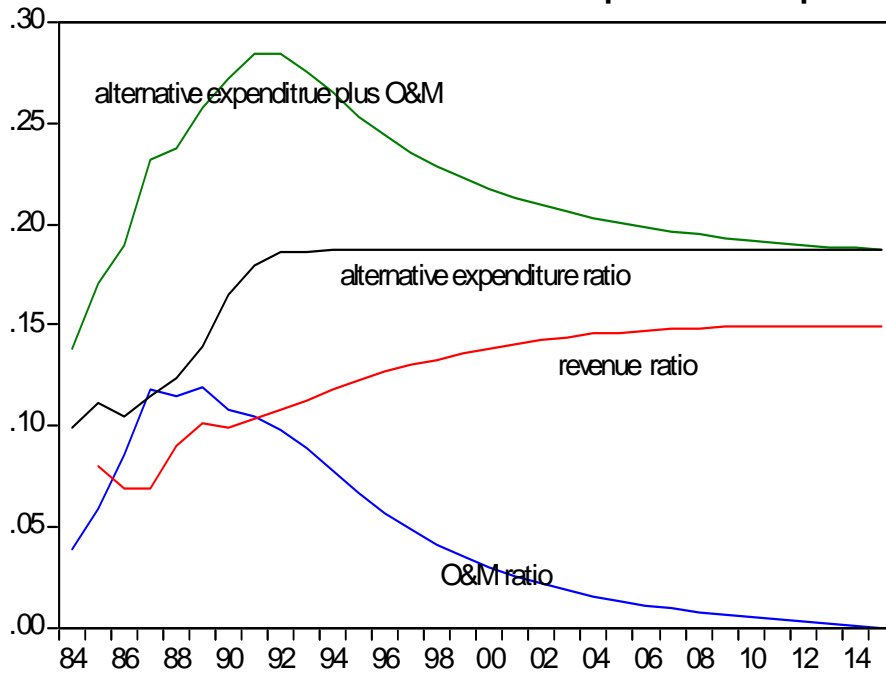
*Policy Implications:* Unless there is a very significant source of revenue increases or the government identifies wasteful operating expenditures — both of which are unlikely — there will still be a need for some donor assistance for the operating budget. Regarding revenue, the VAT is not likely to be implemented for two years; even when it is, it is likely to be revenue-neutral for the first few years. Extractive industries are starting to produce revenue, but their future for revenue generation depends on a stable security environment. Even under those conditions, they are unlikely to provide significant revenue over the near term. With compensation responsible for most operating expenditures, it would be difficult to find a cost-effective way to reduce expenditures.



### C. O&M of Capital Projects Financed by Donors

Very few donor-financed projects (either on budget or externally financed) have been included in the baseline forecast. An estimate of potential O&M is included in this scenario. As explained in Section I, the capital stock that requires O&M expenditures is based on a heavily discounted value of donor expenditures. The rationale for discounting is that these projects include a heavy security component, and most expenditures were based on western prices; this overstates their real value. Irrespective of this discounting, it can be argued that this approach underestimates the O&M, since the external budget data include only the information available in the MoF's Donor Assistance Database. Some experts have estimated that this database captures less than half of all external development spending. The results shown in Figures 1 and 2 indicate that, even under these conservative assumptions, the size of this potential O&M expenditure is almost equal to the current operating budget!

**Figure 2. MTFF Alternative Baseline Assumptions for Expenditures**



Note that in the alternative baseline, operating expenditures as a percentage of GDP no longer drop from 1390 but stay as a constant percentage of GDP. Now there is no break-even point; rather, there is a gap of about 5 percent of GDP. If the estimates of O&M are even close to accurate, it shows a huge gap between revenue and

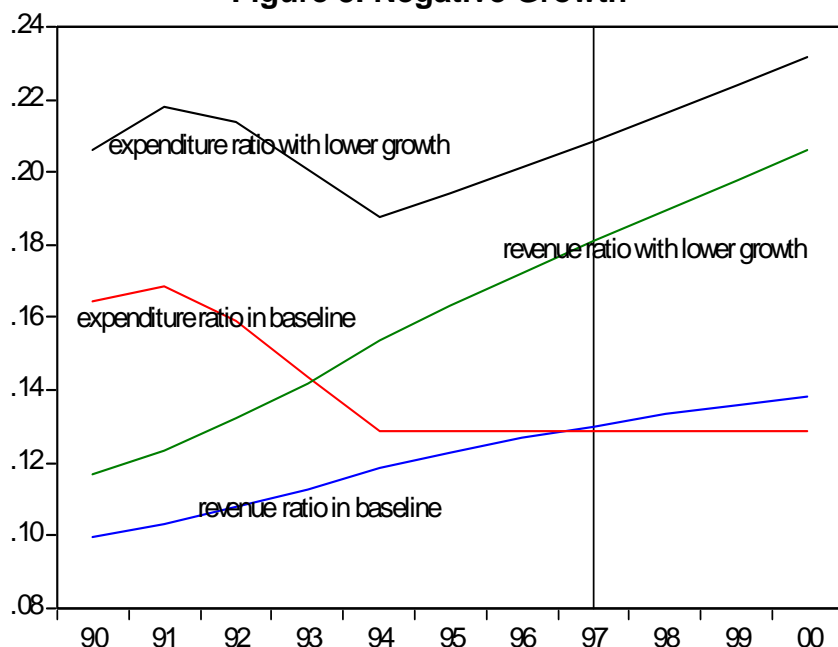
*Policy Implications:* Even with this heavy discounting and the fact that the size of the capital stock is likely underestimated, the potential size of these expenditures is substantial. Furthermore, this does not take into account the costs of nonpersonal security or the second civil service. Obviously, there is no way that these expenditures are sustainable or could be financed. However, it must be acknowledged that this analysis estimates potential O&M. In fact, there is a significant amount of capital that is unlikely

to be maintained by the Afghan government. Many donor projects were implemented based on the priorities of donors, rather than the government. The high spending in Helmand and Kandahar relative to safer parts of the country reflect this. Decisions will have to be made about what capital should and should not be maintained. Recent work by the World Bank and the MoF, with support from donors, include identifying donor-financed capital and estimating O&M costs. When completed, this analysis should provide critical input to support the decision process.

#### **D. Output Effects of the Transition/Transformation**

As international forces leave Afghanistan and donors reduce their support in Afghanistan, there is likely to be some negative influence on output. On one hand, the larger the domestic content of donor and security activities the larger the negative output effects. Furthermore, the transition is likely to have a negative wealth effects as asset prices decline. On the other hand, the transition should reverse some “donor disease,” causing a decline in the real exchange rate and relative prices, which should provide some positive output effects. The size of these influences is not known, but most experts agree it is likely to be negative. In this scenario, the influence of a 5 percent decline in real growth is analyzed (Figure 3). There are a few important consequences. Assuming unchanged expenditures, this results in a rise in the expenditure/GDP ratio. The lower growth rate reduces revenue, but the revenue ratio rises — although not by as much as the expenditure ratio. The reason for the increase in the revenue ratio is that some revenue are unaffected by real output (mining and overflight), and revenue efficiency is also unaffected.

**Figure 3. Negative Growth**



Fall in GDP growth of 5 percent. While nominal revenue falls (not shown), it does not fall as much as GDP in percentage terms because some revenue is not changed (overflight revenue, mining, and non-tax revenue, for example). Thus, the revenue/ GDP ratio rises. However, since spending is unchanged, the expenditure ratio rises by the full 5 percent. The net effect is that, despite the rise in the revenue ratio, it is more than offset by the expenditure ratio rise. This is unsustainable. This assumes imports were unchanged. While imports usually move with income because they are donor- and drug-driven, the change in GDP would be expected to have a smaller impact on imports than in an industrial

*Policy implication.* The output effects of the transition may or may not be large, but will undoubtedly produce additional fiscal pressure.

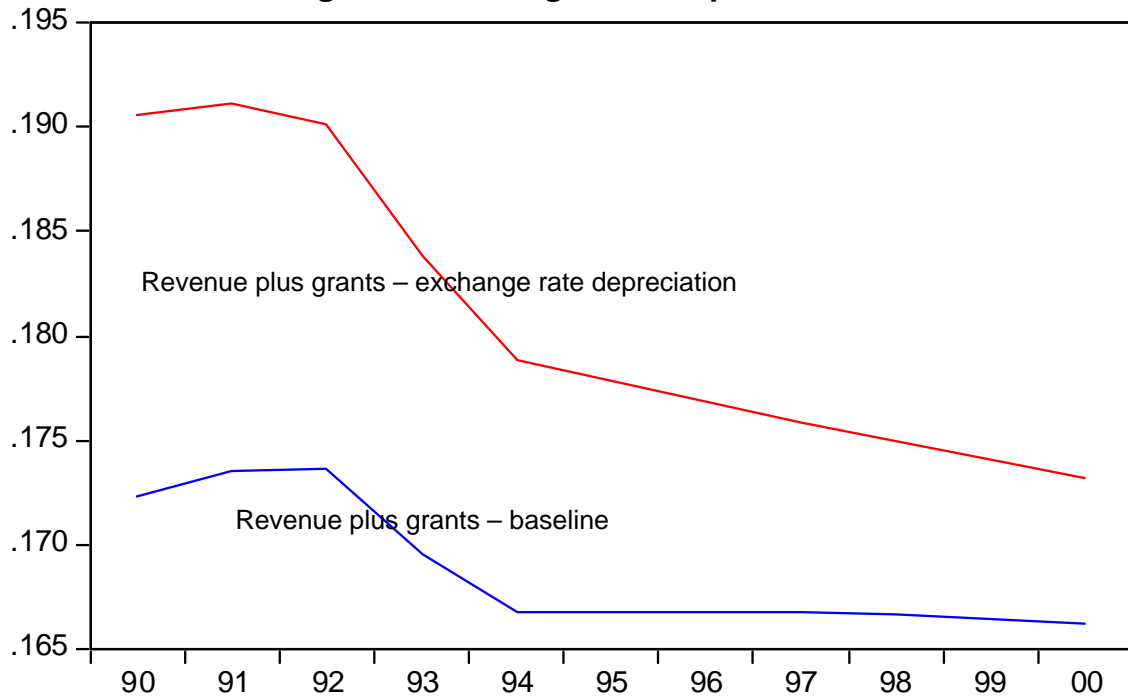
### E. Exchange Rate Depreciation

The transition is likely to result in downward pressure on the real exchange rate, which should dampen some of the output loss. It is uncertain how much real depreciation will occur through the exchange rate vs. prices/wages. In this scenario, we evaluate the fiscal effects of a 25 percent nominal depreciation assuming unchanged real variables (e.g., GDP)<sup>3</sup>. The results show that the depreciation has a positive effect on the fiscal balance for several reasons (Figure 4). First, grants, which support a significant amount of the core budget (some of the operating and most of the development budget) are in dollars and the depreciation increases their value in Afghani. Most operating expenditures are in local currency, and at least part of the development expenditures are in local currency. In

<sup>3</sup> It is likely that the depreciation should result in some decline in net imports. However, in this scenario nominal imports are assumed unchanged; this is consistent with the valuation effect offsetting the real effect.

this scenario, it is assumed that half of core budget development expenditures are in local currency. Taken together, this implies a positive net impact on the fiscal position.

**Figure 4. Exchange Rate Depreciation**



*Policy Implications:* Any depreciation resulting from the transition is likely to have a positive effect on the fiscal position. However this will be relatively minor compared to most of the other negative fiscal pressures.

#### **F. Simulation Conclusions**

This section examined several different scenarios associated with the transition. By no means are these simulations exhaustive regarding the possible influences on the fiscal position of the transition; they are only suggestive. But clearly, the government will be faced with some large fiscal pressures and will need to work with donor partners to develop a viable fiscal strategy. It is more a question of fiscal survival than sustainability.

## SECTION III. MODEL ENHANCEMENTS AND OTHER CONSIDERATIONS

The model remains a work in progress. There are a number of directions that can and should be taken. This includes adding a real sector (including mining), adding debt and interest rates — an issue that may take on increasing importance given fiscal needs. Other possible extensions include incorporating a detailed fiscal security sector, linking financing directly to specific development expenditures, or looking at alternative ways to distribute development financing (e.g., ANDS targets). It has been suggested that the model may be further disaggregated into specific activities and projects to help the MoF budget department develop its budget. The model should also benefit from recent work on O&M; it is hoped that work will be incorporated into the O&M part of the model. However, adding any additional complexity usually creates additional work and can produce unwanted side effects. All of these extensions are possible, but any changes that are made need to be well thought through to ensure consistency with the underlying model structure.

The biggest challenge will be for policy analysts to use the model. It was developed to be relatively user-friendly. As with any model, it is nearly impossible to make it menu-driven unless users only want to work with very simple scenarios that rely on one-off changes in a variable. Once a user wants to target a variable or add an equation to explain a currently exogenous variable, menu-driven approaches become untenable. Thus some familiarity with Eviews is essential — but Eviews requirements have been kept to a minimum. Programs were developed so users need only to specify a few key parameters to develop the baseline forecast. Similarly, a number of simulation programs have been written that limit the need for programming in scenario analysis.

For individuals who have never used Eviews, but have some familiarity with other time series econometric packages, it should take about two days of intensive training to feel comfortable working with this fiscal model. A week of training would be required for individuals who have never used this type of program.

There is another limiting factor — which should be resolved fairly soon. A model requires uncomplicated access to the data used by the model. The Revenue Trend Analysis System developed by BITSOF/ARDS simplifies updating the revenue side of the model. The same cannot be said for the expenditure and financing data. However, a project is underway using the MoF's State Budget Planning System that is designed to support easy retrieval of expenditure and financing data. But until this project is completed, updating the model will be a very cumbersome and time-consuming task.

## ANNEX A. MODEL MNEMONICS AND MODEL STRUCTURE

### A. Model Mnemonics

- OP $xx$ yy – operating expenditure
  - $xx$  is a ministry code from Chart of Accounts (COA)
  - $yy$  is an expenditure code:
    - 21 – compensation
    - 22 – goods
    - 23 – interest
    - 24 – transfers and subsidies
    - 25 – operating budget capital
- OP $yy$  – operating expenditures for government for codes  $yy$  (as above)
- OPMIN $xx$  – total operating budget for ministry  $xx$
- Rev $zzzzz$  – revenue using five-digit COA object code
  - The first two digits are for major codes:
    - rev11 – domestic taxes
    - rev12 – custom duties
    - rev13 – non-tax revenue
    - rev14 – miscellaneous revenue
    - rev15 – sale of assets
    - rev17 – retirement contributions
  - Minor codes use three digits; all five digits represent the entire object code
- Dev $xx$ , Dev $xx$ ext, Inv $xx$ ,  $kxx$ , oandm $xx$ , Dev $xx$ exog – different variables for ministry  $xx$ 
  - Dev $xx$  – core budget development budget spending for ministry  $xx$
  - Dev $xx$ ext – development spending from the external budget
  - Inv $xx$  – investment spending for ministry  $xx$
  - $kxx$  – capital stock for ministry  $xx$
  - Oandm $xx$  – is estimated oandm spending for ministry  $xx$
  - Dev $xx$ exog – earmarked development spending for ministry  $xx$
- Aggregated values appear without the  $xx$ . (e.g., Dev)
  - Dev – total core budget development budget spending
  - Devext – total development spending from the external budget
  - Inv – total investment for government
  - K – total capital stock for government
  - Oandm – total estimated oandm spending
- Cont $zzzzzzz$  – Various items in the contingency budget. Historically, they are 0 because they appear under ministry budgets but are in current and future budgets as

contingency expenditures. This annex does not list the individual contingencies because they are self-explanatory (e.g., contsalang – Salang tunnel; concricketteam – cricket team)

- **xxx2GDP** – any variable shows as a percent of GDP
- **xxxbase** – historical level of a variable and used for certain types of simulations
- **xxxexog** - exogenous level of a variable; used when value is predetermined
- **xxx\_a** – the residual or add factor in an equation; needed to ensure that equation will result in historical values of a variable
- **xxx dum** – a dummy taking value 1 or 0 depending on which part of an equation is active in a simulation
- **Devearmrkd** – sum of all earmarked development budget spending
- **Devexp** – expected development spending
- **Devexpgrowth** – growth rate of expected development spending
- **Devunalloc** – unallocated development spending

## **B. Operating Budget Grants**

- **Opgrantartf** – ARTF operating budget grants
- **Opgrantlotfa** – LOTFA operating budget grants
- **Opgrantcstcamod** – CSTC operating budget grants for Ministry of Defense
- **Opgrantcstcamoi** – CSTC operating budget grants for Ministry of Interior
- **Opgrantlotfamoj** – CSTC operating budget grants for Ministry of Justice
- **Opothergrants** – Other operating budget grants

## **C. Exogenous Grant Financing Items for Development**

- **Adb** – ADB grant
- **Artfinc** – ARTF incentive window
- **Artfinv** – ARTF investment window for development budget
- **Cntf** – Counter narcotic trust fund
- **Devrevenueother** – Other development budget revenue
- **IFAD** – ??????
- **JNPGA** – Japanese ??????
- **LOTFA** – Law and Order Trust Fund
- **WBIDA** – World Bank IDA grants
- **USMON** – U.S. Monetization Grants
- **PSIB** – WB program Support grant
- **Other Donors** – Other donor grants

## **D. Financing and Loans**

- **Adbloans** – ADB loans
- **Adbcarryforward** – ADB money from previous years
- **Wbloans** – World Bank Loans
- **Othermultiloans** – Other multilateral loans
- **Salenonfinassetdev** – Sale of non-financial assets

- Principalrepayment -- Principal repayment of Loans

## E. Key Exogenous Variables for Revenues and Expenditures

- capgrowth – growth rate of current budget capital spending
- compgrowth – growth rate of government wage compensation
- transfgrowth – growth rate of transfers and subsidies
- goodsgrowth – growth rate of government goods and services
- importgrowth – growth rate of imports
- Inflation – inflation
- gdpgrowth – GDP growth rate
- GDPN – nominal GDP
- Worldgrowth – world growth rate
- Worldinflation – world inflation
- Nontaxefficiency – efficiency for non-tax revenue
- Taxefficiency – efficiency for tax revenue
- buddum – separates historical from forecast (0 before 1390 and 1 thereafter); used, for example, to ensure contingencies are added to budget in future years but not historically
- Revtodev – planned transfer of revenue from operating budget to development budget
- salenonfinassetdev – sale of non-financial assets for development budget
- saleofassets – sale of financial assets
- carryover – development funds carried over from one year to the next

## F. Definitions

- Devbalgrants – development balance including grants
  - Devbalxgrants – development balance excluding grants
  - Devfinancing – development budget financing
  - Devfinancing2gdp – same, but as a percent of GDP
  - Ddevgrantstotal – development budget grants
  - Devnewgrants – new grants for development budget
  - Devrevenue – total development budget revenue
  - Devsharetotal – total development budget financing that will be shared out
  - Opbalgrants – operating balance including grants
  - Opbalxgrants – operating balance excluding grants
  - Opexp – operating expenditures
  - Opexpplusoandm – operating expenditures plus estimated value of O&M not in budget
  - Opgrants – operating budget grants
  - Revenue – domestic tax and nontax revenue
  - Revenueop – revenue for the operating budget less sale of assets
  - Revenueopigrants – revenue for the operating budget including grants
- 
- Dev*nds* – National Development Strategy sector aggregates for development spending
  - OP*nds* – National Development Strategy sector aggregates for operational spending



- Where *nds* are agriculture, governance (gov), security, infrastructure (infrastruct), education, health, social sector (social), and economic governance (ecgovernance)

## **G. Ministry Chart of Account Codes**

10	President's Office
11	Upper House (Masharano Jarga)
12	Lower House (Walsi Jarga)
13	Administrative Affairs
14	Supreme Court
15	President's Protective Services + NSO
20	Ministry of Finance
21	Ministry of Parliamentary Affairs
22	Ministry of Defense
23	Ministry of Foreign Affairs
24	Ministry of Religious Affairs and Hajj
25	Ministry of Commerce
26	Ministry of Interior
27	Ministry of Education
28	Ministry of Higher Education
29	Ministry of Refugees and Repatriation
32	Ministry of Mines
34	Ministry of Communication
35	Ministry of Economy
36	Ministry of Information, Culture and Youth
37	Ministry of Public Health
38	Ministry of Women's Affairs
39	Ministry of Agriculture
41	Ministry of Water and Energy
42	Ministry of Public Works
43	Ministry of Rural Rehabilitation and Development
45	Ministry of Transport & Aviation
46	Ministry of Border and Tribal Affairs
47	Ministry of Labor, Social Affairs & Martyrs and Disabled
48	Ministry of Counter Narcotics
49	Ministry of Urban Development & Housing
50	Ministry of Justice
51	Attorney General's Office
58	ANSA
59	Independent Directorate of Local Governance
60	Independent Directorate of Environment
61	Science Academy
62	IARCSC
63	National Olympics Committee
64	General Directorate of National Security
65	Geodesy and Cartography Office

66	Control and Audit Office
67	The High Office of Oversight & Anti-Corruption
68	Office of Disaster Preparedness
72	Election Commission
73	National Statistics Office
74	Legal Training Center
75	Afghanistan High Atomic Energy Commission
76	Directorate for Kuchis
79	Kabul Municipality
80	AISA
81	Micro Finance Investment Support Facility for Afghanistan
82	Water Supply and canalization corporation
83	Da brishna shirkat
84	Independent Board of New Kabul
87	Human Rights Commission
90	Office of Father of Nation
91	Ministry of Martyrs and Disables
92	Ministry of Youth
93	Independent Commission for Oversight and Implementation of Constitution
94	Commission of Anti Corruption
95	Office of Repatriates
97	Water and Irrigation
98	Alternative Livelihood
110	Afghan Independent Human Rights Commission
111	Da Afghanistan Bank
112	Other

## H. Revenue Codes

### H1. Aggregate Revenue codes

<u>Rev11</u>	<u>Domestic taxes</u>
Rev111	Fixed taxes
Rev112	Income taxes
Rev113	Property taxes
Rev114	Sales taxes
Rev115	Excise taxes
Rev116	Other taxes
Rev117	Tax penalties and fines
Rev12	Custom Duties
<u>Rev13</u>	<u>Non-tax revenue</u>
Rev131	Income from capital property
Rev132	Sales of goods and services
Rev133	Administrative fees
Rev134	Royalties

Rev135	Non-tax fines and penalties
Rev14	Miscellaneous revenue
Rev15	Sales of land and building
Rev17	Retirement contributions

Note: IMF aggregate revenue codes are aggregates of these items

## H2. Detailed Revenue Codes

rev11100	Licensed Merchants
rev11101	Small Shops and Unions
rev11102	Mills, Grinders, Extractors
rev11103	Cinema Theatres, Exhibitions
rev11104	Money Changers
rev11105	Govt Contracts Goods Services
rev11106	Imports by Unlicensed Business
rev11107	Exports by Unlicensed Business
rev11108	Others not included above
rev11109	Imports by Licensed Business
rev11110	Exports by Licensed Business
rev11200	Employee Salary and Wages
rev11201	Declaration Income(PIT-Ind.)
rev11202	Profits Private Entities(CIT)
rev11203	Profits Coop, Social (CIT-Coop)
rev11207	Rental Services Withholding
rev11210	Withholding Taxes on Interest
rev11211	Withholding Taxes on Dividends
rev11212	Withholding Taxes on Royalties
rev11213	Construction Withholding Tax
rev11214	Flat Concession Fee ( Traders )
rev11300	Land Taxes
rev11301	Immovable Prop (Indv., Legal)
rev11302	Tax Sale Immovable Prop
rev11303	Tax Sale Movable Prop
rev11401	Receipts Pvt Entit. (BRT) – 2%
rev11402	Receipts SOE (BRT-SOE's) –5%
rev11403	BRT on Services – 10%
rev11404	2% BRT on Imports
rev11602	Road Licenses Motor Vehicles
rev11605	Transit Tickets Taxes
rev11606	Other Taxes
rev11700	Overdue Income Tax (Penalties)
rev11701	Fines BRT-Penalties
rev11702	All Other Tax Penalties
rev12000	Customs Duty Imports
rev12002	Customs Fines

rev12003	Customs Duty Exports
rev12004	Temp Tax Return Fee-T1 Asycuda
rev12005	Strap Fastening Services Fee
rev12006	Fee - Processing Tax Return
rev12007	Income from Confiscated Goods
rev13101	Interest Received Foreign
rev13102	Investment Rev. –Pvt Sector
rev13103	Unclassified Revenue
rev13109	Net Earnings – Agriculture
rev13110	Depreciation
rev13111	Rents and Plane Fees
rev13112	Rights for Mineral Extraction
rev13201	Rental Government Housing
rev13202	Rental Government Shops
rev13203	Lease Government Land
rev13204	Rent Agriculture Lands
rev13205	Rental Confiscated Property
rev13207	Rental Markets and Parking Lot
rev13209	Sale of Agricultural Products
rev13210	Communication Postal Services
rev13211	Water and Power Services
rev13213	Mobile Telephone Services
rev13217	Sales of Maps
rev13218	Sales of "Official Gazettes"
rev13219	Printing Services from MWP
rev13222	Magazines and Newspapers
rev13224	Commercial License Booklets
rev13226	Tourism Services
rev13227	Health Services
rev13228	Pharmacies in Hospitals
rev13229	Transport Services
rev13230	Truck Commissions
rev13231	Tickets
rev13235	Rent- Tech. Equipment Vehicles
rev13236	Sale- Tech. Equipment Vehicles
rev13239	Sale- Movable Items
rev13240	Services Rendered
rev13241	Sale of Goods
rev13300	Fees - National Identity Cards
rev13301	Fees For Passports
rev13302	Visa Fees
rev13303	Passport Revenue
rev13304	Sales Of Valuable Documents
rev13305	Revenue From Post Offices
rev13306	Vehicle Registrations-Initial
rev13307	Vehicle - Transfer And Renewal

rev13308	Drivers Licenses (Drivers)
rev13309	Profess.&Agricultural Licenses
rev13310	Defendant Attorney Licenses
rev13312	Licenses Sold By SoEs
rev13313	State Agency Licensing
rev13315	Social Organization License
rev13316	Commercial Licenses
rev13317	Security Documents And Forms
rev13319	Kindergarten Entry Fees
rev13320	Commissions Levied At 10%
rev13322	Transit Permits
rev13323	Overflight Revenues
rev13324	Judicial Services - Law Courts
rev13325	Revenue From Civil Disputes
rev13326	Legal Fees For Lawsuits
rev13327	Legal Services Provided
rev13329	Airport Departure Fee
rev13330	Road Toll Fees
rev13331	Vehicle Entry Fee at Borders
rev13332	University Fees
rev13334	Digging Deep Wells
rev13335	Soil Analysis
rev13337	Revenues From Numbered Plates
rev13339	Revenue- Auction Participation
rev13341	Night Shift Students Fee
rev13342	Dairy Revenue
rev13343	Sukook Revenue
rev13344	Registration Motor Vehicles
rev13346	Government Documents
rev13347	Work Permits – Afghans
rev13348	Broker License Fee
rev13349	Work permits – Foreigners in Afghanistan
rev13350	Business Registration Fees
rev13400	Sale of natural gas
rev13402	Sale of Minerals
rev13500	Fines (Penalties)
rev13501	Fines - individuals and legal
rev13502	Traffic Fines
rev13503	Criminals and Prisoners
rev13600	Extractive License Fee
rev13601	Extractive Royalty Fee
rev13602	Extractive Penalty Fee
rev13604	Extarctive Rental Fee
rev13605	Extarctive Bid Fee
rev14002	Certification of Documents
rev14003	Share in Government Enterprise

rev14004	Additional Payment Foreign A
rev14005	Transfers From Prior Years
rev14006	Miscs Revenue Private Sector
rev14007	Misc Revenue Gov Enterprises
rev14008	Consultative Engineering Svcs
rev14009	Miscellaneous Revenue
rev14010	Unclassified Revenues
rev14046	Loan Recovery – Local Government
rev14047	Reimbursement Returned Amounts
rev15000	State-Owned Arable Land
rev15001	Sale State-Owned Non-Arable
rev15002	Sale State-Owned Buildings
rev15099	Sale of State-Owned Land & Buildings
rev17100	Pre Pay & Grade Government Employee Retirement Contribution
rev17102	Ret Investment Income
rev17121	Pay & Grade Govt Employee Ret Contribution
rev17131	Security Sector Pensions Employee Contributions

## ANNEX B. MODEL EQUATIONS

### A. Expenditure

#### A1. Operating Expenditures

$$\text{opxxyy} = \text{opxxyy}(-1) * (1 + \text{zzzzgrowth}) * \text{opxxyydum} + (1 - \text{opxxyydum}) * \text{opxxyyexog}$$

- **xx** is a ministry code from COA (see COA appendix)
- **yy** is an expenditure code (i.e., 21, 22, 24, and 25 and 23) only applying to **zzzz** is an exogenous growth factor (e.g., compensation, goods, capital, transfers)
- **opxxyydum** – is a 1,0 dummy to determine if the expenditure is exogenous or determined by the behavioral equation

For example:

$$\text{op1021} = \text{op1021}(-1) * (1 + \text{compgrowth}) * \text{op1021dum} + (1 - \text{op1021dum}) * \text{op1021exog}$$

NOTE: There are 221 of these equations: 55 spending units, four COA types of expenditures, and one for interest.

#### A2. Development Expenditures

$$\text{devxx} = \text{devxxexog} * (1 - \text{devdumxx}) + \text{devdumxx} * \text{devxx}(-1) / \text{devsharetotal} * \text{devunearmrkd}$$

- the terms  $\text{devxx}(-1) / \text{devsharetotal} * \text{devunearmrkd}$  basically shares out spending
- $\text{devxxexog}$  is the earmarked or predetermined value of development spending. It is most useful in budget preparation.
- $\text{Devdumxx}$  is a 1,0 dummy to determine whether the development spending for this ministry is exogenous or shared out

For example:

$$\text{dev37} = \text{dev37exog} * (1 - \text{devdum37}) + \text{devdum37} * \text{dev37}(-1) / \text{devsharetotal} * \text{devunearmrkd}$$

### B. Revenue

$$\text{Revzzzzz} = \text{Revzzzzz}(-1) * (1 + \text{exogenousrev})$$

- Where **zzzzz** is a revenue object code and
- **Exogenousrev** includes up to three of the revenue factors including:
  - Gdpgrowth
  - Worldgrowth

- Importgrowth
- Inflation
- Worldinflation
- Taxefficiency
- Nontaxefficiency

### C. Investment, Capital, and O&M

$$inv_{xx} = op_{xx}25 + devaluedev(xx) * dev_{xx} + devalueextdev(xx) * dev_{xx}ext$$

- where  $devaluedev(xx)$  and  $devalueextdev(xx)$  are the shares of core budget and external development spending that represents real investment for ministry xx

$$k_{xx} = k_{xx}(-1) * (1 - dep(xx)) + inv_{xx}$$

- where  $dep(xx)$  is the depreciation rate of capital for ministry xx

$$oandm_{xx} = oandmrate(xx) * k_{xx}(-1)$$

- where  $oandmrate(xx)$  represents the  $oandmrate$  applied to the estimated government capital stock for ministry xx

### D. The Rest of the Model

The rest of the model contains a large set of equations for fiscal balances; fiscal variables relative to GDP or its aggregate; NDS sectors; ministry spending; total operational spending by economic classification; aggregation of revenue object codes into key revenue categories; aggregation of development spending; operational and development grants; development financing; government investment; government capital; and estimated government O&M.



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