Macroeconomic Dynamics and the Effects of Fiscal Spending in Uganda
Annex I: Estimates of Fiscal Multipliers

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1 Methodology

Following Čapek & Crespo Cuaresma (2020), I estimate *discounted cumulative multipliers* of fiscal spending on economic activity in Uganda, defined as

$$m_i^T = \frac{\sum_{t=0}^{T}(1+i)^{-t}\Delta y_t}{\sum_{t=0}^{T}(1+i)^{-t}\Delta g_t}, \tag{1}$$

where T is the time horizon over which the multiplier is computed, i is an average interest rate to discount the future, Δy_t denotes the deviation of economic activity from the baseline and Δg_t is the deviation of fiscal spending from the baseline. Following the literature, I use the SVAR models with 5 variables (fiscal spending, economic activity, consumer prices, the 91-day T-Bill rate and credit to the private sector) introduced in section 5 of the main paper, to compute T-period impulse response function. In Eq. 1 Δy_t then denotes the response of economic activity in period t to a shock in fiscal spending g in period 0, and Δg_t is the response in period t of spending itself to the shock in period 0. The interest rate i to discount the effects of fiscal spending in the future is taken as the median 365-day T-Bill rate between 2010 and 2020, which is $i^A = 13.1\%$. The corresponding quarterly rate is $i^Q = (1+i^A)^{1/4}-1 = 3.13\%$, and a monthly rate is $i^M = (1+i^A)^{1/12}-1 = 1.032\%$.

As discussed in Spilimbergo et al. (2009), VARs have the advantage of capturing dynamics, and the response of other macroeconomic variables such as interest rates. Higher frequency data in the VAR reduces simultaneity bias and renders less important the identifying restrictions, provided of course that the reduced form errors are also less correlated at higher frequencies. In Uganda, further problems arise at higher frequencies, in particular in monthly data pertaining to the measurement of economic activity and the noisy nature of monthly fiscal spending data. As in the main paper, fiscal spending multipliers are therefore computed at multiple different frequencies: monthly, quarterly and fiscal years, using outcome measures available at those frequencies and aggregating higher-frequency measures. To also assess robustness across identification strategies, multipliers are computed using both the recursive and structural identification scheme discussed in section 4 of the paper. To also gauge the importance of including additional variables in the SVAR, I additionally estimate a simple bivariate recursive VAR with just fiscal spending and economic activity (fiscal spending is contemporaneously exogenous to economic activity).

In contrast to section 4 of the paper, I allow variable lag lengths in the different SVAR specifications, selected using the corrected AIC criterion: monthly/quarterly SVARs with 5 variables are allowed up to 4/2 lags, respectively, whereas the bivariate VARs may have up to 12/4 lags. SVARS at fiscal year frequency have 1 lag whereas the bivariate versions have 1 or 2 lags.

In line with Čapek & Crespo Cuaresma (2020) and most of the literature, I examine cumulative multipliers over the course of 1 year following the shock, such that $T = 12$ for monthly data and $T = 4$ for quarterly data. To assess robustness against possible adverse long-term effects, I also report multipliers calculated over 3-year horizons ($T = 36$ for monthly data and $T = 12$ for quarterly data). As in section 4 of the paper, SVARs are estimated with all variables non-seasonally adjusted and in log-levels, all models include a linear time trend, and monthly and

quarterly models additionally include a set of seasonal dummies.

Section 2 below presents results with the spending aggregates and specification used in the main paper. Section 3 goes beyond the paper and presents a disaggregated fiscal multiplier study considering disaggregated pending which is matched to the respective VA components of GDP.

2 Aggregate Spending Multipliers

Below, the multiplier estimates from SVARs estimated at different frequencies are reported. A tiled figure presenting multipliers at the 2-digit level with supporting colour coding facilitates quick comprehension, and the table below provides the same multipliers written out to 4 digits. Additional information is available in an accompanying Excel sheet, which also provides the number of observations (N) and lag order (p) of the SVAR underlying each estimate.

2.1 Monthly Data

Figure 1: Fiscal Multiplier Estimates from Monthly SVARs

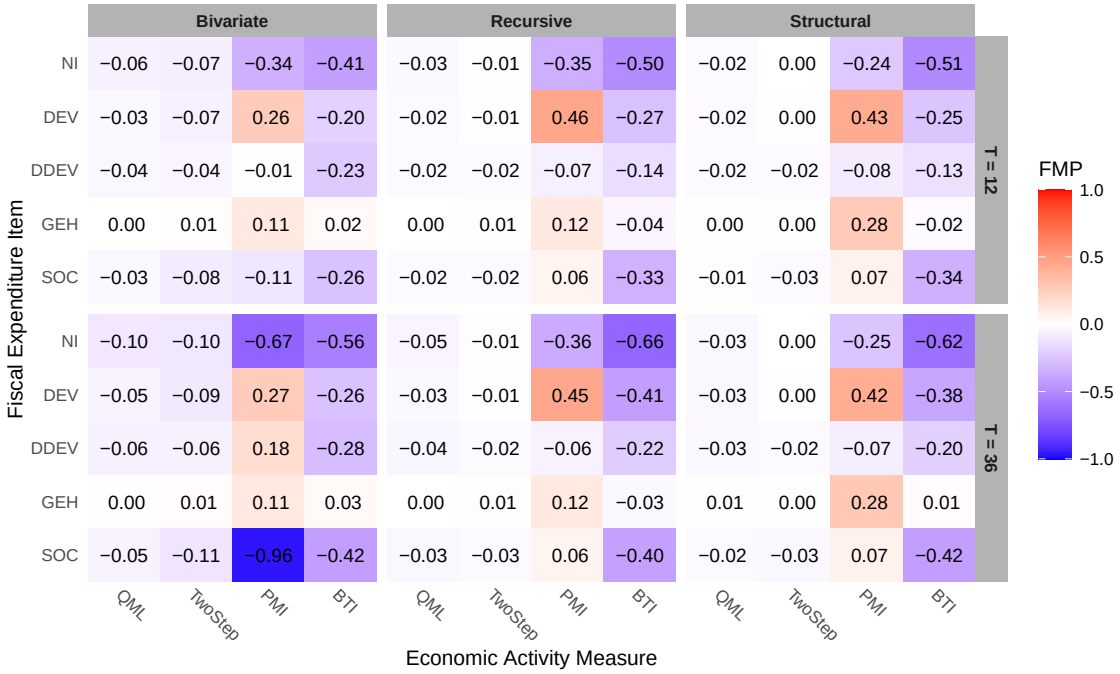


Table 1: Fiscal Multiplier Estimates from Monthly SVARs

		Bivariate		Recursive		Structural	
EXP	EA	$T = 12$	$T = 36$	$T = 12$	$T = 36$	$T = 12$	$T = 36$
NI	QML	-0.0640	-0.0997	-0.0297	-0.0482	-0.0202	-0.0319
NI	TwoStep	-0.0722	-0.1007	-0.0082	-0.0118	0.0019	-0.0002
NI	PMI	-0.3408	-0.6709	-0.3484	-0.3629	-0.2363	-0.2496
NI	BTI	-0.4098	-0.5554	-0.4982	-0.6614	-0.5068	-0.6188
DEV	QML	-0.0295	-0.0519	-0.0208	-0.0300	-0.0236	-0.0328
DEV	TwoStep	-0.0652	-0.0932	-0.0099	-0.0092	-0.0040	-0.0032
DEV	PMI	0.2643	0.2654	0.4605	0.4535	0.4325	0.4249
DEV	BTI	-0.1979	-0.2643	-0.2656	-0.4146	-0.2479	-0.3808
DDEV	QML	-0.0351	-0.0609	-0.0219	-0.0368	-0.0203	-0.0325
DDEV	TwoStep	-0.0447	-0.0644	-0.0178	-0.0241	-0.0166	-0.0217
DDEV	PMI	-0.0067	0.1761	-0.0664	-0.0559	-0.0829	-0.0714
DDEV	BTI	-0.2280	-0.2847	-0.1437	-0.2191	-0.1335	-0.2004
GEH	QML	0.0021	0.0036	0.0003	-0.0016	0.0042	0.0057
GEH	TwoStep	0.0120	0.0142	0.0094	0.0126	0.0031	0.0032
GEH	PMI	0.1149	0.1149	0.1224	0.1156	0.2753	0.2829
GEH	BTI	0.0250	0.0250	-0.0404	-0.0316	-0.0154	0.0134
SOC	QML	-0.0316	-0.0532	-0.0220	-0.0338	-0.0143	-0.0202
SOC	TwoStep	-0.0831	-0.1135	-0.0213	-0.0256	-0.0258	-0.0331
SOC	PMI	-0.1053	-0.9632	0.0566	0.0556	0.0719	0.0708
SOC	BTI	-0.2613	-0.4195	-0.3341	-0.4040	-0.3368	-0.4181

2.2 Quarterly Data

Figure 2: Fiscal Multiplier Estimates from Quarterly SVARs

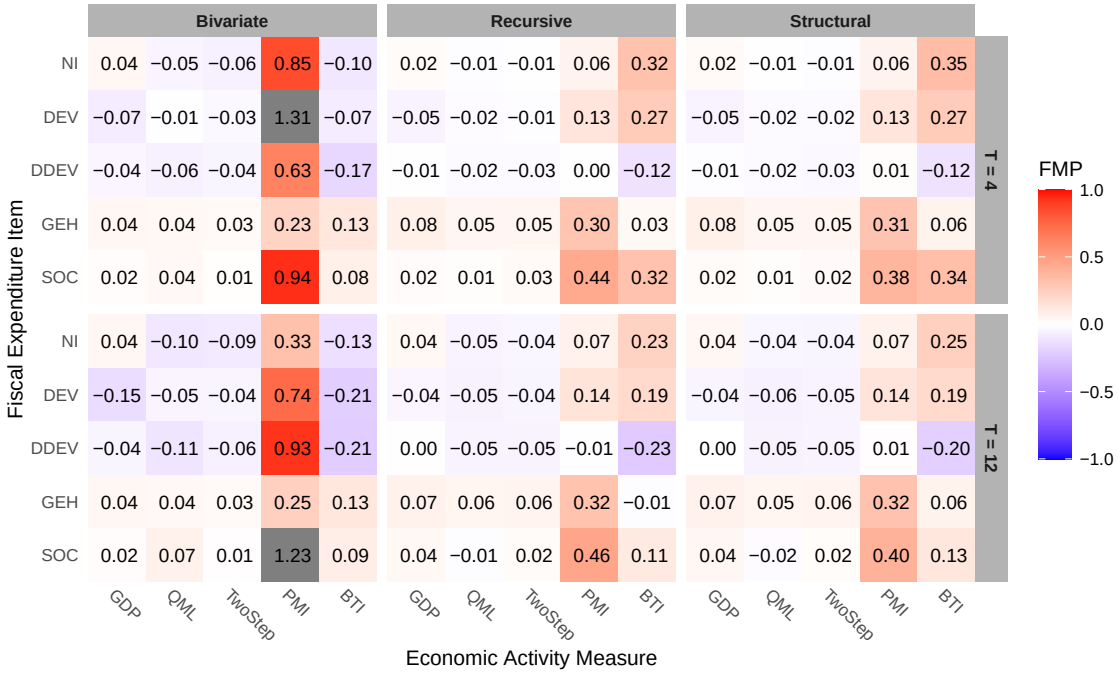


Table 2: Fiscal Multiplier Estimates from Quarterly SVARs

		Bivariate		Recursive		Structural	
EXP	EA	$T = 4$	$T = 12$	$T = 4$	$T = 12$	$T = 4$	$T = 12$
NI	GDP	0.0439	0.0442	0.0214	0.0375	0.0250	0.0409
NI	QML	-0.0480	-0.1012	-0.0127	-0.0502	-0.0056	-0.0368
NI	TwoStep	-0.0634	-0.0883	-0.0095	-0.0381	-0.0133	-0.0423
NI	PMI	0.8540	0.3264	0.0624	0.0696	0.0620	0.0691
NI	BTI	-0.1018	-0.1345	0.3195	0.2310	0.3451	0.2507
DEV	GDP	-0.0748	-0.1453	-0.0506	-0.0416	-0.0509	-0.0419
DEV	QML	-0.0094	-0.0452	-0.0163	-0.0540	-0.0234	-0.0620
DEV	TwoStep	-0.0285	-0.0424	-0.0144	-0.0423	-0.0197	-0.0487
DEV	PMI	1.3097	0.7359	0.1343	0.1408	0.1341	0.1405
DEV	BTI	-0.0749	-0.2078	0.2676	0.1939	0.2675	0.1944
DDEV	GDP	-0.0408	-0.0422	-0.0103	0.0035	-0.0121	0.0017
DDEV	QML	-0.0603	-0.1115	-0.0224	-0.0527	-0.0236	-0.0547
DDEV	TwoStep	-0.0434	-0.0624	-0.0253	-0.0505	-0.0270	-0.0523
DDEV	PMI	0.6342	0.9257	-0.0028	-0.0064	0.0124	0.0092
DDEV	BTI	-0.1689	-0.2138	-0.1233	-0.2263	-0.1224	-0.2016
GEH	GDP	0.0402	0.0408	0.0803	0.0707	0.0800	0.0706
GEH	QML	0.0376	0.0356	0.0461	0.0550	0.0456	0.0541
GEH	TwoStep	0.0267	0.0305	0.0482	0.0578	0.0493	0.0598
GEH	PMI	0.2253	0.2507	0.3048	0.3152	0.3056	0.3159
GEH	BTI	0.1275	0.1282	0.0334	-0.0129	0.0650	0.0638
SOC	GDP	0.0155	0.0157	0.0199	0.0387	0.0216	0.0402
SOC	QML	0.0362	0.0692	0.0106	-0.0146	0.0112	-0.0161
SOC	TwoStep	0.0069	0.0079	0.0277	0.0214	0.0240	0.0179
SOC	PMI	0.9391	1.2328	0.4432	0.4622	0.3814	0.3989
SOC	BTI	0.0790	0.0891	0.3170	0.1116	0.3354	0.1272

2.3 Annual (FY) Data

Figure 3: Fiscal Multiplier Estimates from FY SVARs

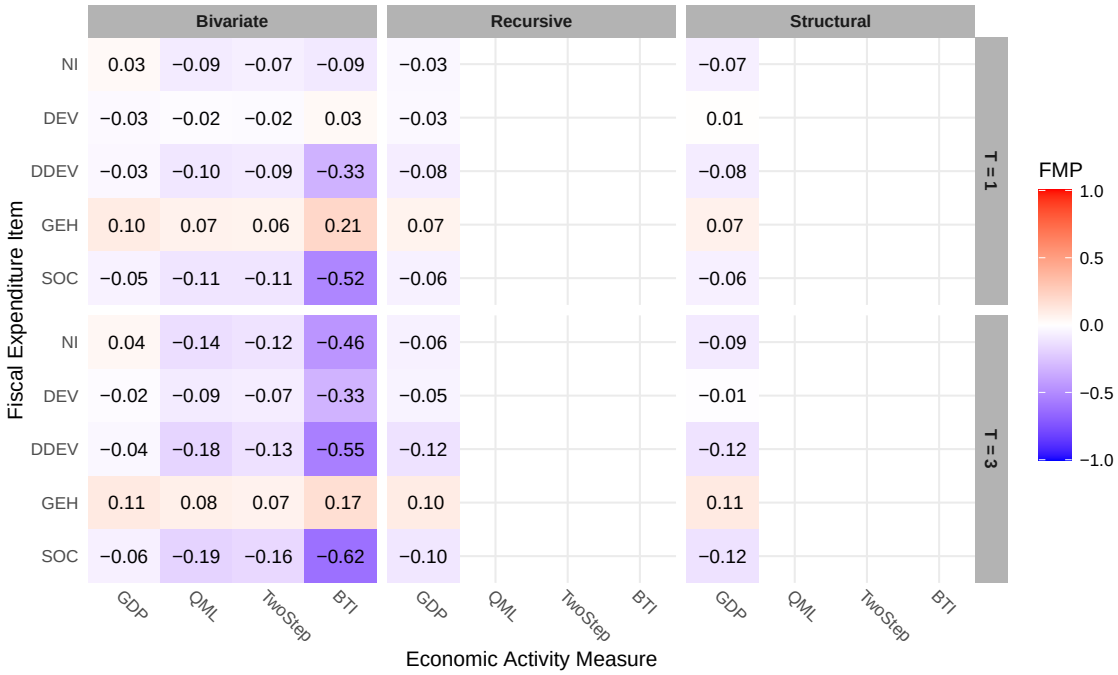


Table 3: Fiscal Multiplier Estimates from FY SVARs

		Bivariate		Recursive		Structural	
EXP	EA	$T=1$	$T=3$	$T=1$	$T=3$	$T=1$	$T=3$
NI	GDP	0.0301	0.0430	-0.0346	-0.0575	-0.0659	-0.0881
NI	QML	-0.0867	-0.1411				
NI	TwoStep	-0.0662	-0.1170				
NI	BTI	-0.0949	-0.4570				
DEV	GDP	-0.0257	-0.0172	-0.0315	-0.0500	0.0075	-0.0084
DEV	QML	-0.0156	-0.0867				
DEV	TwoStep	-0.0209	-0.0745				
DEV	BTI	0.0333	-0.3254				
DDEV	GDP	-0.0327	-0.0354	-0.0778	-0.1249	-0.0809	-0.1174
DDEV	QML	-0.1010	-0.1798				
DDEV	TwoStep	-0.0887	-0.1283				
DDEV	BTI	-0.3321	-0.5521				
GEH	GDP	0.1017	0.1117	0.0654	0.1000	0.0742	0.1104
GEH	QML	0.0678	0.0793				
GEH	TwoStep	0.0638	0.0665				
GEH	BTI	0.2090	0.1698				
SOC	GDP	-0.0534	-0.0615	-0.0598	-0.1015	-0.0619	-0.1228
SOC	QML	-0.1115	-0.1893				
SOC	TwoStep	-0.1107	-0.1645				
SOC	BTI	-0.5246	-0.6186				

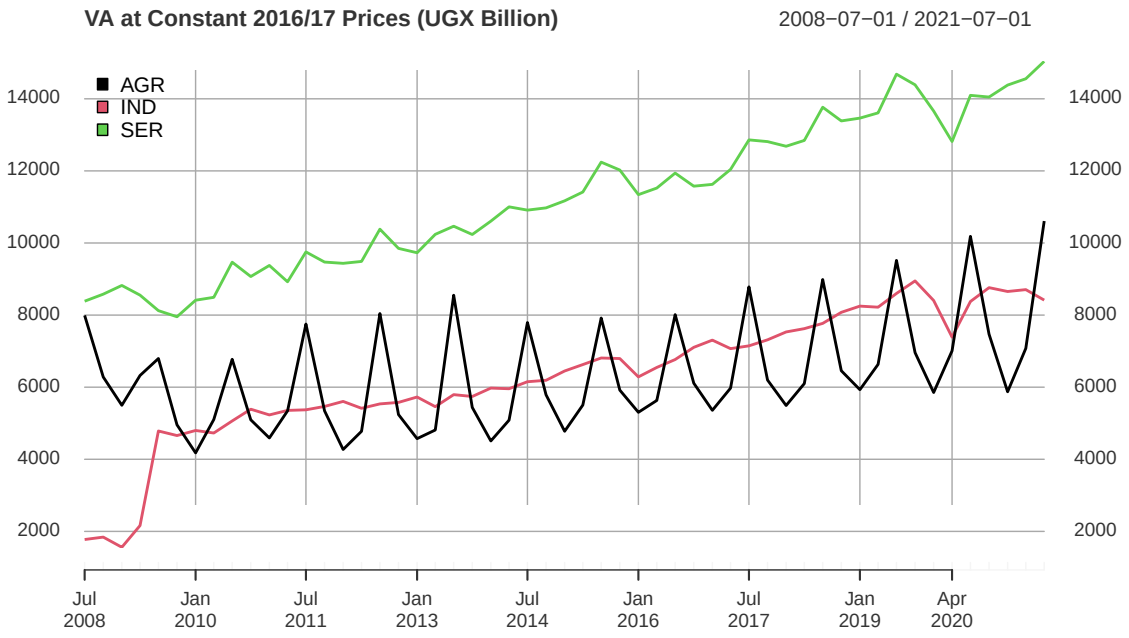
3 Disaggregate Spending Multipliers

This section considers disaggregated fiscal spending, which is matched to different VA components in GDP to determine sectoral fiscal multipliers. I start with a 3-sector disaggregation considering spending multipliers on agriculture, industry and services activities, before disaggregating spending further within those broad sectors.

3.1 3-Sector Economy

Figure 4 shows a breakdown of quarterly GDP (available since Q3 2008) at constant prices in the 3 broad sectors: agriculture, industry and services. It is evident that agricultural activity in Uganda exhibits strong seasonality, which is much less prevalent in industry and service activities.

Figure 4: Broad Sector GDP Breakdown



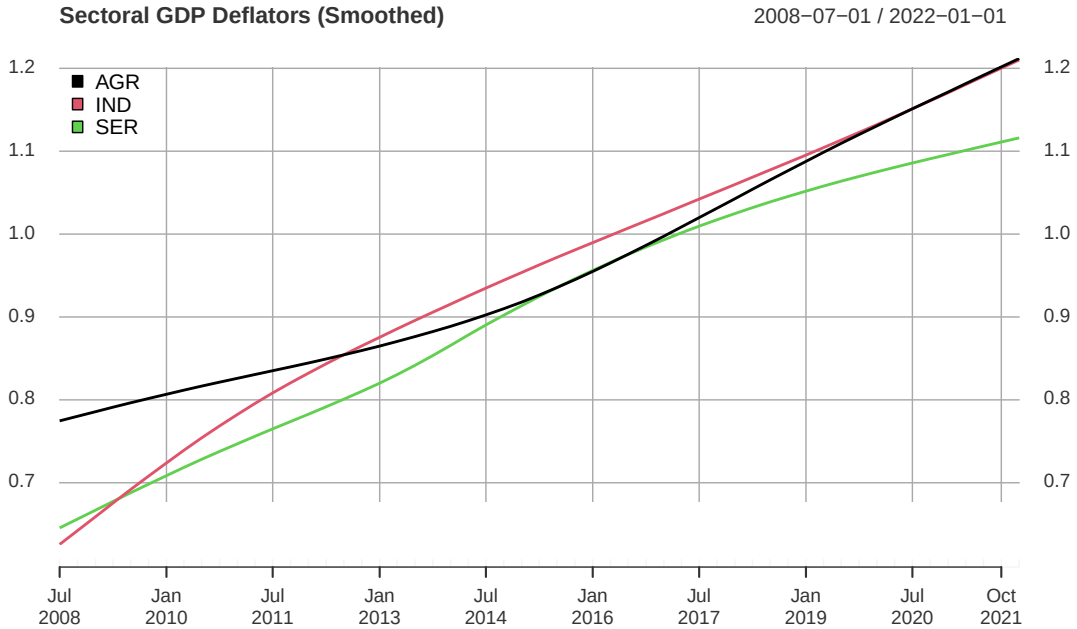
The COVID-19 shock is thus clearly visible in industry and services VA, but masked by seasonality in agricultural VA. Table 4 shows a rough matching of government expenditure items by National Budgetary Framework Sector Classifications (NBFS, computed by MoFPED within the GFSM 2014 accounting framework) to the 3 GDP sectors.

Table 4: Matching Expenditure Items to Broad GDP Sectors

AGR	IND	SER
Agriculture	Roads & Works	Education
	Water & Environment	Health
	Energy & Minerals	Lands, Housing & Urban Development
	Trade & Industry	Social Development
		ICT
	Administrative Services:	Security
		Accountability
		Justice, Law & Order
		Public Sector Management
		Public Administration

Some recently added items in this classification: Tourism, Science Technology and Development, and Local Government, were omitted due to short data coverage. Service sector spending was also divided into administrative spending and other (social) spending. To relate this spending to GDP, I deflate it using sectoral GDP deflators, obtained by dividing the current price VA series by the constant price versions shown in Figure 4, and smoothing the result with a cubic spline. Figure 5 shows the resulting deflator series.

Figure 5: Broad Sector GDP Deflators



I then consider 3 types of expenditure which are available disaggregated by the NBFS sectors shown in Table 4: total spending (TOT), which includes donor project disbursements, non-wage recurrent spending (NWR), and domestic development spending (DDEV). Figure 6 shows the constant price ratios of sectoral spending to sectoral VA on a log10 scale, where SER includes all services spending, and SER_NPA excludes the public administrative services listed below the line in Table 4. Figure 6 uncovers that spending within different GDP sectors differs both in magnitude and in composition. Government spending on agriculture only makes up 3% of agricultural VA towards the end of the period, and is mostly composed of development spending. In industry and

services VA, the total government share is significantly higher, at 17% and 31%, respectively. In industry DDEV spending makes up around 8.8% of VA, whereas NWR spending only accounts for 2.2%. In services this pattern is reversed, with NWR spending accounting for 10% of VA and DDEV spending at 6.5% of VA in recent years, up from less than 3% at the beginning of the period. Excluding public administrative services spending reduces the VA share of government spending to 10%, or 3% NWR and 1% DDEV spending shares.

Figure 6: Ratios of Expenditure Aggregates to Sector VA

Figure 7 and Table 5 show the multiplier estimates from a bivariate SVAR model with spending and the corresponding VA component, where multipliers are discounted using the quarterized 365 day T-bill rate, and are reported for 4-quarter and 12-quarter horizons. The model is again estimated with quarterly dummies to curb seasonality, and series in log-levels.

Figure 7: Fiscal Multipliers for Bivariate SVAR: 3-Sector Economy

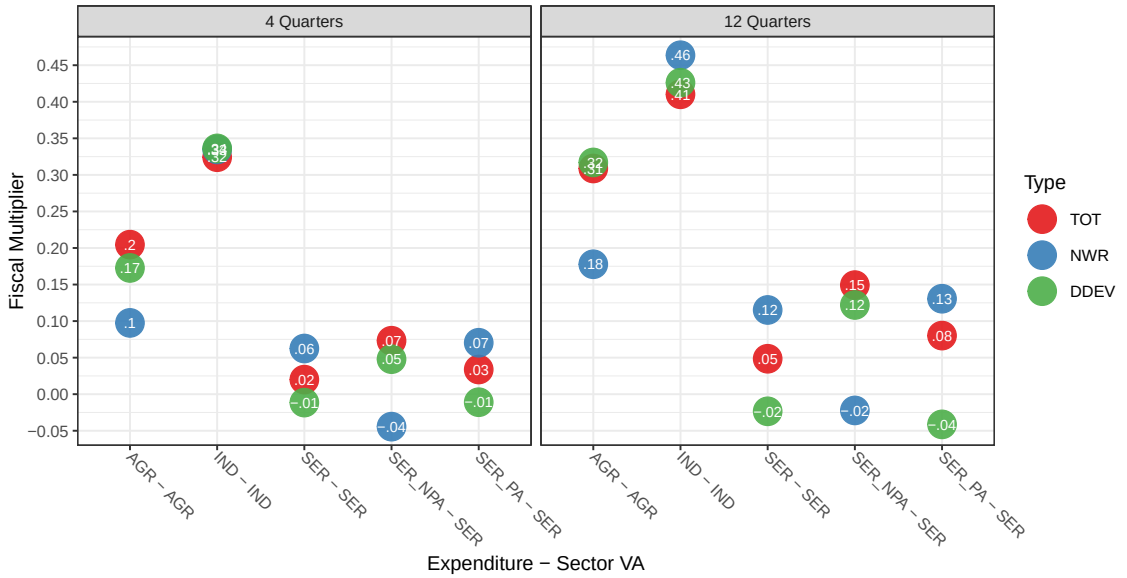


Table 5: Fiscal Multipliers for Bivariate SVAR: 3-Sector Economy

EXP	GDP	Horizon	TOT	NWR	DDEV
AGR	AGR	4	0.205	0.098	0.173
AGR	AGR	12	0.309	0.178	0.317
IND	IND	4	0.324	0.335	0.336
IND	IND	12	0.410	0.464	0.426
SER	SER	4	0.020	0.062	-0.011
SER	SER	12	0.048	0.115	-0.023
SER_NPA	SER	4	0.073	-0.044	0.048
SER_NPA	SER	12	0.149	-0.022	0.122
SER_PA	SER	4	0.034	0.070	-0.011
SER_PA	SER	12	0.080	0.131	-0.041

As evident from Figure 7, the sectoral multipliers are quite different. Industry has the largest total spending multipliers of 0.32 for the 4-quarter horizon and 0.41 for the 12-quarter horizon . This is followed by agriculture with multipliers of 0.21 and 0.31 for the 4 and 12 quarter horizons, respectively. The total services multiplier is substantially lower, at 0.02 and 0.05, respectively. When taking public administration out, the multiplier increases to 0.07 and 0.15, respectively. Curiously the multiplier on administrative spending (SER_PA) is also higher than the total service spending multiplier, at 0.034 and 0.08 for the 4- and 12-quarter horizons, respectively. It should also be noted that the total multipliers on public administration are about half the size of the total multipliers on other services.

When spending is disaggregated by purpose, the agriculture multipliers are greater on DDEV spending and lower on NWR, and the industry multipliers are similarly high for all strands of spending. For total services spending, the NWR multiplier is considerably higher at 0.12 than the total spending multiplier at 0.05. This is especially reflected in the public administration services, which account for 2/3 of total services spending. For other services spending (including health and education), the DDEV multiplier of 0.12 is considerably higher for the NWR multiplier of -0.02. For total services and public administration, the DDEV multipliers are negative and close to zero.

Overall these results should be treated with caution, particularly results for the service sector where spending is very broadly dispersed, and where the multipliers are therefore surrounded by greater statistical uncertainty. They do overall however strongly suggest that spending on industry, agriculture, and social services such as health and education is better for growth than spending on public administration, which over the past 3 years has accounted for 64% of total services spending, 46% of total government spending, and 8.5% of GDP.

3.2 Disaggregated Industry and Services Multipliers

To investigate the disaggregated effects of spending on different industrial and services sectors, I attempt to map government spending sectors to GDP sectors as classified by the UBOS according to the System of National Accounts (SNA) 2008, shown in Table 6. Comparing to the GFSM 2014 Spending classification given in Table 4, makes it evident that apart from agriculture, health, education and ICT, there is no clear correspondence between the two classifications. Thus it remains to do an inexact mapping, including compounding of some categories to create a clearer correspondence.

Table 6: GDP Sector Classification

Quarterly VA at Constant 2016/17 Prices (UGX Billion)

Variable	Label
AGR	**Agriculture, Forestry and Fishing**
IND	**Industry**
IND_MIN	Mining & Quarrying
IND_MAN	Manufacturing
IND_ELC	Electricity
IND_H2O	Water
IND_CON	Construction
SER	**Services**
SER_WRT	Trade & Repairs
SER_TRA	Transportation & Storage
SER_AFS	Accommodation & Food Service
SER_ICT	Information & Communication
SER_FIN	Financial and Insurance
SER_REE	Real Estate Activities
SER_PST	Professional, Scientific & Technical
SER_ADM	Administrative & Support Service
SER_PAD	Public Administration
SER_EDU	Education
SER_HEA	Human Health & Social Work
SER_AER	Arts, Entertainment & Recreation
SER_OTH	Other Service Activities
SER_HHA	Activities of Households

Table 7 shows such a rough mapping of GDP industry and service sectors to GFSM 2014 sectors, and also to Outlays according to the GFSM 2001, also recorded by MoFPED. The mapping invites compounding of certain categories, in particular I compound water and electricity into a category I call utilities, manufacturing and trade and repairs, and construction and transportation and storage. In the GFSM 2001 there are also outlays on mining, manufacturing construction, but it turns out that the spending in this category is less than 1% of the corresponding GDP sectors VA, thus I refrain from estimating a multiplier here.

Table 7: GDP to Expenditure Mapping

GDP	GDP_Label	EXP14	EXP14_Label	EXP01	EXP01_Label
IND_MIN	Mining & Quarrying	EXP_EAM	Energy & Minerals	OUT_EA_MMC_01	Economic Affairs: Mining, Manufacturing, and Construction
IND_MAN	Manufacturing	EXP_TTI	Tourism, Trade & Industry	OUT_EA_MMC_01	Economic Affairs: Mining, Manufacturing, and Construction
IND_ELC	Electricity	EXP_EAM	Energy & Minerals	OUT_EA_EFU_01	Economic Affairs: Fuel and Energy
IND_H2O	Water	EXP_WAE	Water & Environment	OUT_EP_01	Environmental Protection
IND_CON	Construction	EXP_LHUD	Lands, Housing & Urban Development	OUT_EA_MMC_01	Economic Affairs: Mining, Manufacturing, and Construction
IND_CON	Construction	EXP_RAW	Roads & Works	OUT_EA_MMC_01	Economic Affairs: Mining, Manufacturing, and Construction
SER_WRT	Trade & Repairs	EXP_TTI	Tourism, Trade & Industry		
SER_TRA	Transportation & Storage	EXP_RAW	Roads & Works	OUT_EA_TRA_01	Economic Affairs: Transport
SER_AFS	Accommodation & Food Service	EXP_TOU	Tourism	OUT_HC_01	Housing and Community Amenities
SER_AFS	Accommodation & Food Service	EXP_LHUD	Lands, Housing & Urban Development	OUT_HC_01	Housing and Community Amenities
SER_ICT	Information & Communication	EXP_ICT	Information & Communication Technology	OUT_EA_COM_01	Economic Affairs: Communication
SER_REE	Real Estate Activities	EXP_LHUD	Lands, Housing & Urban Development	OUT_HC_01	Housing and Community Amenities
SER_PST	Professional, Scientific & Technical	EXP_STD	Science Technology and Development		
SER_ADM	Administrative & Support Service	EXP_PSM	Public Sector Management	OUT_POS_01	Public Order and Safety
SER_ADM	Administrative & Support Service	EXP_PAD	Public Administration	OUT_POS_01	Public Order and Safety
SER_PAD	Public Administration	EXP_PSM	Public Sector Management	OUT_DEF_01	Defense
SER_PAD	Public Administration	EXP_PAD	Public Administration	OUT_DEF_01	Defense
SER_PAD	Public Administration	EXP_LGOV	Local Government	OUT_DEF_01	Defense
SER_EDU	Education	EXP_EDU	Education	OUT_EDU_01	Education
SER_HEA	Human Health & Social Work	EXP_HEA	Health	OUT_HEA_01	Health
SER_HEA	Human Health & Social Work	EXP_SD	Social Development	OUT_HEA_01	Health
SER_AER	Arts, Entertainment & Recreation	EXP_TOU	Tourism	OUT_REC_01	Recreation, Culture and Religion

Figure 8 shows ratios of GDP to spending sectors (format: GDP - EXP). When GDP sectors were compounded, the broad sector prefixes (IND_ or SER_) are omitted, e.g. compounding IND_MAN and SER_WRT results in a new item called MAN_WRT. Utilities is the combination of IND_ELC and IND_H2O in terms of VA, and EXP_EAM and EXP_WAE in terms of government spending. Since the ratios in many sectors are volatile, the bottom panel of Figure 8 shows 2-year (8-quarter) rolling averages of the ratios. The smoothed ratios show that in most sectors spending is between 5% and 80% of VA. Exceptions are Tourism, Trade & Industry (TTI)

and Lagds, Housing and Urban Development (LHUD) where spending is 1% or less than the corresponding sector VA (manufacturing and trade for TTI and real estate and accommodation and food service activities for LHUD). The multipliers estimated in such cases should be taken with great caution, because government spending is likely to be of little economic significance in the economic dynamics characterizing these sectors, and thus correlations in the data more likely to be spurious.

Figure 8: Ratios of Disaggregated Expenditure Aggregates to Sector VA

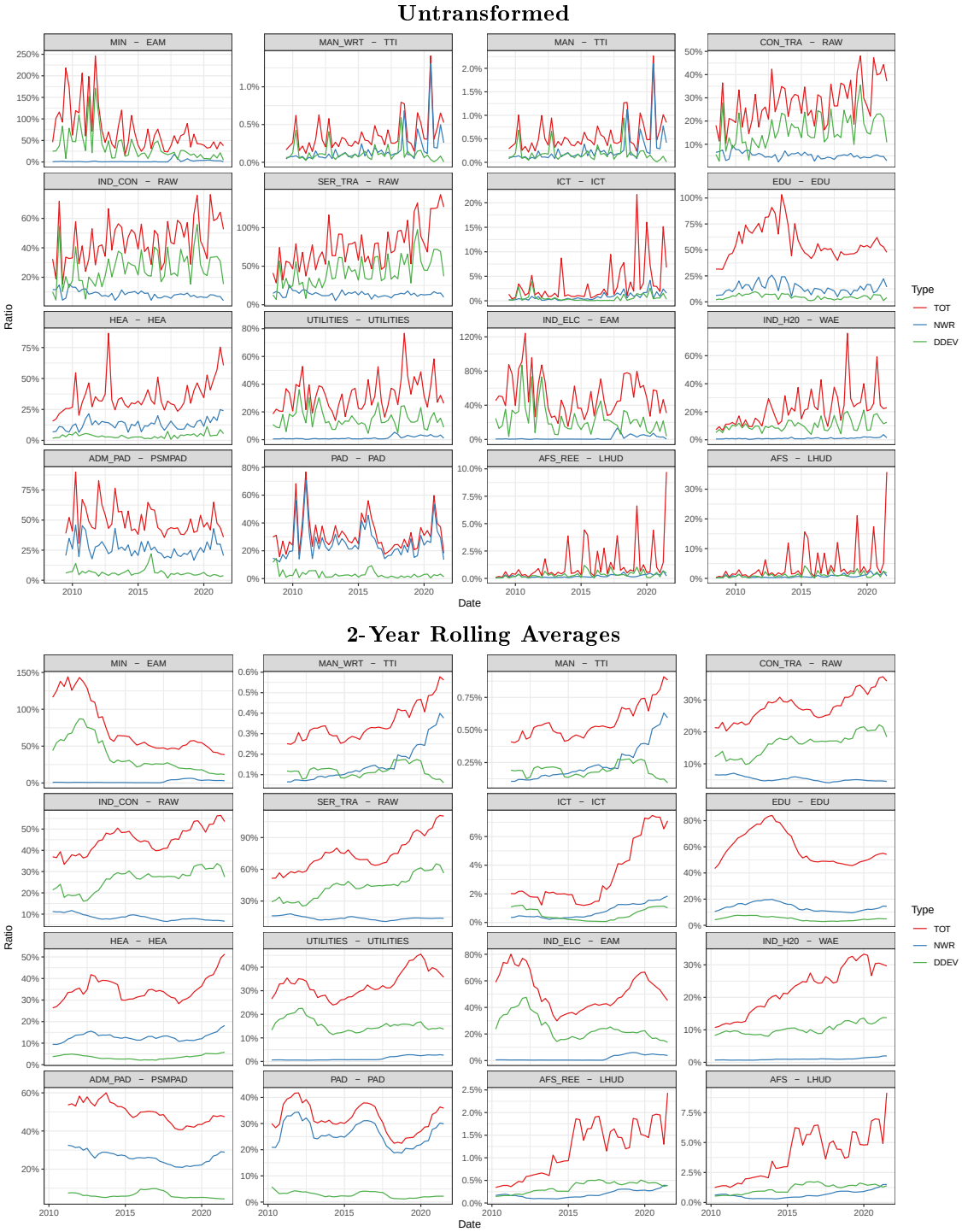
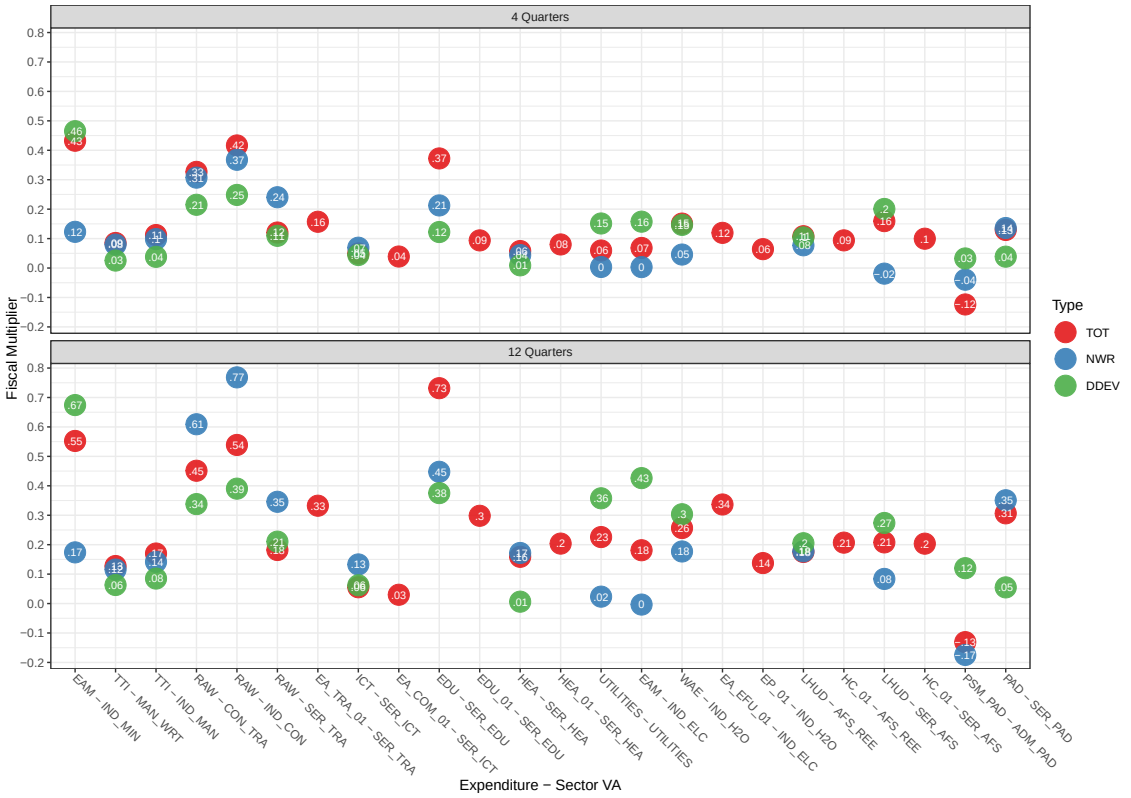


Figure 9 and Table 8 show the resulting multiplier estimates. Disaggregations of spending into NWR and DDEV are not available for GFSM 2001 (suffix _01) items, thus for these items only total spending multipliers are estimated. The results suggest that fiscal spending in 3 sectors yields noticeably higher returns for VA and thus economic activity generated than other sectors: energy

and minerals (EAM), roads and works (RAW), and education. In the medium term (12 quarters), education has the greatest spending multiplier of 0.73, with EAM and RAW around 0.55, whereas in the short term (4 quarters), education has a total spending multiplier of 0.37, which is slightly lower than EAM and RAW at 0.43. I note that these multipliers multiplier only concerns additional VA generated in the sector itself, thus they do not capture the total effects of spending on the economy. Spending on all 3 sectors is likely to have significant externalities beyond the immediate sector. This is especially true for education, which is a prerequisite for the availability of skilled domestic labour to engage in other high VA activities such as construction and mining. The long term total economy multiplier of education spending is thus likely to be significantly higher than 1. The results thus suggest that apart from EAM and RAW, which are already priority spending sectors, education should also be a top priority spending sector as spending there pays off both in the short and medium term, and in the long term.

Figure 9: Fiscal Multipliers for Bivariate SVAR: Disaggregated Industry and Services



Apart from these 3 sectors, transport services and utilities received slightly higher multipliers. The medium-term (12 quarter) multiplier on transport services is 0.33, fuel and energy 0.34, and water and environment 0.26. On the other hand, the least effective strand of spending appears to be spending on public sector management and public administration, which has negative multipliers in both the short- and medium-term on its own VA to the economy (i.e. suggesting that the sector would be better off if spending were reduced). When considering DDEV spending instead of total spending, it appears that EAM has the highest medium-term (12 quarter) multiplier at around 0.67, followed by RAW, education, and utilities (fuel, energy and water), with multipliers between 0.36 and 0.39. A curious result in the findings is the low spending multiplier on ICT services, that appears to be below 0.1 in both the short- and medium-term. Given the relatively small size of fiscal spending relative to VA in this sector (less than 5% of ICT VA for most of the period), it may as well be contended that government efforts are rather marginal to the growth of the sector, and thus the effect not clearly identified. Finally, when considering NWR spending, RAW has the highest multipliers, at 0.37 in the short term (4 quarters) and 0.77 in the medium term (12 quarters), followed with some distance by education with NWR multipliers 0.21 and 0.45, respectively.

Table 8: Fiscal Multipliers for Bivariate SVAR: Disaggregated Industry and Services

EXP	GDP	Horizon	TOT	NWR	DDEV
EAM	IND_ELC	4	0.068	0.003	0.158
EAM	IND_ELC	12	0.181	-0.003	0.426
EAM	IND_MIN	4	0.432	0.123	0.465
EAM	IND_MIN	12	0.552	0.174	0.674
TTI	IND_MAN	4	0.112	0.098	0.038
TTI	IND_MAN	12	0.170	0.142	0.085
TTI	MAN_WRT	4	0.085	0.080	0.025
TTI	MAN_WRT	12	0.127	0.116	0.063
RAW	CON_TRA	4	0.327	0.307	0.215
RAW	CON_TRA	12	0.451	0.609	0.338
RAW	IND_CON	4	0.416	0.368	0.248
RAW	IND_CON	12	0.539	0.768	0.390
RAW	SER_TRA	4	0.121	0.240	0.109
RAW	SER_TRA	12	0.182	0.346	0.210
EA_TRA_01	SER_TRA	4	0.157		
EA_TRA_01	SER_TRA	12	0.332		
ICT	SER_ICT	4	0.050	0.069	0.044
ICT	SER_ICT	12	0.055	0.133	0.062
EA_COM_01	SER_ICT	4	0.039		
EA_COM_01	SER_ICT	12	0.030		
EDU	SER_EDU	4	0.372	0.213	0.122
EDU	SER_EDU	12	0.732	0.448	0.375
EDU_01	SER_EDU	4	0.094		
EDU_01	SER_EDU	12	0.298		
HEA	SER_HEA	4	0.058	0.044	0.009
HEA	SER_HEA	12	0.159	0.172	0.006
HEA_01	SER_HEA	4	0.080		
HEA_01	SER_HEA	12	0.204		
UTILITIES	UTILITIES	4	0.060	0.004	0.151
UTILITIES	UTILITIES	12	0.226	0.023	0.358
WAE	IND_H2O	4	0.151	0.046	0.147
WAE	IND_H2O	12	0.257	0.177	0.303
EA_EFU_01	IND_ELC	4	0.119		
EA_EFU_01	IND_ELC	12	0.337		
EP_01	IND_H2O	4	0.064		
EP_01	IND_H2O	12	0.138		
LHUD	AFS_REE	4	0.108	0.077	0.104
LHUD	AFS_REE	12	0.175	0.178	0.205
LHUD	SER_AFS	4	0.159	-0.019	0.201
LHUD	SER_AFS	12	0.208	0.084	0.274
HC_01	AFS_REE	4	0.094		
HC_01	AFS_REE	12	0.207		
HC_01	SER_AFS	4	0.100		
HC_01	SER_AFS	12	0.203		
PSM_PAD	ADM_PAD	4	-0.124	-0.040	0.033
PSM_PAD	ADM_PAD	12	-0.131	-0.175	0.120
PAD	SER_PAD	4	0.129	0.136	0.039
PAD	SER_PAD	12	0.306	0.351	0.055

References

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