# 4.2a Quality issues: exploiting VAT data

Tim Jones SIAP consultant/lecturer

### Objectives

After this session, participants will be aware of:

- How VAT operates
- How VAT data compares with survey data
- Some difficulties to be overcome
- The need for a possessing system
- An example of VAT processing in Excel
- An example of estimating GVA for one activity

### Value added tax (VAT)

- VAT is an SNA "tax on products", implemented in many countries, covering a wide range of activities
- It is levied by the Revenue Authorities in two ways
  - On imports (by Customs)
  - On local value added by registered VAT traders
- Registered VAT traders collect "output" VAT on their sales and may deduct "input" VAT on their imports or purchases from other VAT traders
- Essentially it is a tax on final consumption

### Exploiting VAT data

- Customs data is the source of external trade statistics
- So why not VAT data for output?
- Returns are made quarterly (if not monthly)
- Revenue authorities often capture the data and store them in a database
- The VAT traders must be classified by activity (ISIC or equivalent)

#### Why is VAT data better than a survey?

A census of VAT traders every quarter/month
VAT return is like a simple survey questionnaire
Provided to the revenue authority free
Up-to-date business register not required
Births and deaths automatically accounted for
Severe non-response penalties
Costs of survey can be saved

#### Some caveats

The Revenue Authorities may not cooperate
But the Finance/Economy Minister could intervene
MoF Revenue & Database totals may not agree
If large, the differences should be investigated
The database may not be complete
But the coverage could be assessed
VAT traders may not be well coded by activity
But a special exercise could fix this problem

### Processing VAT data

- A processing system is required
  - to receive the data every quarter
  - to validate it (by comparing with previous quarters)
  - to aggregate it into NA categories
  - possibly to adjust it to account for better coverage

An example Excel workbook shows how aggregated VAT data is adjusted for better coverage in one country...

#### Number of VAT traders

On these slides the formula box is magnified

	_	G.	Numb	er	5				Sty	les						Cells	;		
It	eri	al\Quali	ty\[PROC	VAT.	xlsx]S	umn	nQ'!	Z10											
1		AB	AC	Α	D	AE		Д	١F		AG		А	Н		AI		А	J
	SUM VAT * Microsoft Exert     S																		
Pas	Profer     Home     Insert     Page Layout     Formulas     Data     Review     View     Developer     Eary Document Creator       A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A																		
	Unite     J I II     III     III     III     III     IIII     IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII																		
-	Δ.	Quarterly VA	R T data								2011								AN
1		Quarterly VA	data		200		2010	2010	2010	2010		2011	2011	2011	2012	2012	2012	2012	
2					Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
3					2009		2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2	2012Q3	2012Q4	
4					TRU	E TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
5	CPA	Number of VA	T traders		2.	2% 2.2%	3.1%	2.4%	2.3%	2.0%	2.5%	1.8%	1.8%	1.7%	1.1%	1.1%	1.5%	1.1%	
6	т	Total			26,0		27,427	28,074	28,730	29,294	30,029	30,580	31,134	31,668	32,028	32,393	32,893	33,251	
7	A1	Agriculture and for				60	62	64	66	67	67	66	64	66	64	66	64	64	
8	A2	Livestock & livesto				5 6	6	6	6	6	7	7	7	7	7	8	7	8	
9	B0 C1	Mining and quarryi Manufacture of foo			='C:\U	4 46 sei 569	48	48	47	50 602	52 613	54 617	54 631	56 636	55 644	57 647	59 659	61 662	
	C1 C2	Manufacture of bey				set 509	580	580	590	602	613	67	631	030	74	647	73	73	
12			tiles, clothing & leather		4		418	427	434	434	438	437	441	446	444	449	449	448	
13			od & paper products; prir	nting	5		546	556	571	582	603	616	626	637	653	657	662	674	
14	C5	Manufacture of net	summoad Summo	er & nlastics	3		419	477	431	44			e almost		4		470	474	Þ
Edit		]			Consequent (									age to keep	using iClou	d. m B	1009	6 O	
							-	_			_					1.00			15:00

### VAT turnover

Image:		5	Numb	er	5				Sty	les						Cells	;			
Image: Subject Products       Subject Product	ter	ial\Qualit	ty\[PROC	VAT.xl	sx]Su	Imn	1Q'!	Z64												
A         B         C         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A	1	AB	AC	AD		AE		A	١F		AG		А	Н		AI		A	J	
A       B       C       7       A       AB       C       0       A       AB       C       0       A       AB       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A <th>File</th> <th>Home Insert Pa Cut Calibri</th> <th></th> <th></th> <th></th> <th></th> <th>Easy D</th> <th>ocument C</th> <th></th> <th>ei -</th> <th><b>a</b> 8</th> <th></th> <th>7 3-</th> <th>3</th> <th></th> <th></th> <th>57.6</th> <th>۵</th> <th></th> <th></th>	File	Home Insert Pa Cut Calibri					Easy D	ocument C		ei -	<b>a</b> 8		7 3-	3			57.6	۵		
A       R       C       2       AA       AR       AC       AD       AF       AF<	Paste Clipt	Format Painter B I	Font		Alignment			Numb	per .	Forma	tting = as T Style	able - Style			ormat	Clear *	Sort & Fit Filter * Se	nd &		
2       Q3       Q4       Q1       Q2       Q3       Q4       Q1					2	-						AG	AH	AL	AL	AK	AL	AM	AN	
2       Q3       Q4       Q1       Q2       Q3       Q4       Q1	1	Quarterly VAT	data		2009	2009	2010	2010	2010	2010	2011	2011	2011	2011	2012	2012	2012	2012		
3       200903 200904 201001 201002 201003 201004 201101 201102 201102 201103 201104 201201 201202 201203 201204       201201 201202 201203 201204         4       TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE	2	counterly the				2005														-0
4         TRUE         TR	-						201001	201002												
S8         Turnover of VAT traders         TRUE	-					200344	TRUE	TRUE	202040	202044		LULIGA								
Spectral       TRUE		Turneyer of MA	Ttraders		TROL	TROL	TROL	mor	mor	mor	mor	TROL	mor	mor	mol	mol	mor	TROL		-
60       T       Total       19,131       20,437       18,729       20,138       21,429       23,663       19,367       22,221       25,211       24,770       22,207       24,460       25,516       26,631         61       A1       Agriculture and forestry       19       22       29       19       13       12       15       16       14       13       17       12       12       11         A2       Livesck Rivestock																				-
61       A1       Agriculture and forestry       19       22       29       19       13       12       19       16       14       13       17       12       12       11         62       A2       Livestock kilvestock products; fishing       8       7       5       7       9       8       6       7       6       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       <			nts																	-
S2       A2       Uvestock & Investock products; fishing       8       7       5       7       9       8       6       7       6       9       6       9       9       9         63       B0       Mining and quarrying       14       15       9       13       15       17       12       15       22       22       19       24       23       27         61       B0       B0       B0       Strong and quarrying       14       15       9       13       15       17       12       15       22       22       19       24       23       27         61       Manufacture of tool products       **C/Uses       547       515       577       62       588       66       709       780       683       707       788       799       100       127       183       197       160       129       205       221       181         66       C3       Manufacture of toetrides, clothing & leather       55       125       84       97       100       112       102       103       102       103       102       103       102       103       102       103       102       103       102			to																	-
G3         B00         Mining and quarying         14         15         9         18         15         17         12         15         22         22         19         24         23         27           64         C1         Manufacture of flood products         **C/Usee         547         515         577         625         640         598         667         709         730         683         707         738         799           65         C2         Manufacture of beverages & tobacco         178         174         110         1127         118         197         100         127         101         120         205         221         181           66         C3         Manufacture of beverages & tobacco         178         112         118         127         160         127         128         102         126         103         102         124           66         C3         Manufacture of beverages & tobacco         178         125         84         97         102         118         92         106         107         125         93         103         102         124           66         C4         Manufacture of beverages & tobacco         S					_															
64       C1       Manufacture of food products       IC://Use       547       515       577       625       640       598       667       709       730       683       707       738       799         65       C2       Manufacture of theverages & tobacco       178       140       118       172       197       160       129       205       221       181         66       C3       Manufacture of theverages & tobacco       178       140       118       172       197       160       129       205       221       181         66       C3       Manufacture of textines, clothing & leather       95       125       84       97       102       126       125       93       103       102       124         61       Manufacture of textines, clothing & leather       95       125       84       97       102       126       93       103       102       124         61       Manufacture of textines, clothing & leather       95       102       102       102       103       103       102       124       104       116       116       116       116       116       116       116       116       116       116       116																				-
66     C3     Manufacture of textiles, clothing & leather     95     125     84     97     102     118     92     106     107     125     93     103     102     124       If O H     SummA / SummQ / SummQ / SummQ / Analyse     Oracle / Analyse <td< td=""><td>64 C1</td><td></td><td></td><td></td><td>='C:\Use</td><td>547</td><td>515</td><td>577</td><td>625</td><td>640</td><td>598</td><td>667</td><td>709</td><td>730</td><td>683</td><td>707</td><td>738</td><td>799</td><td></td><td></td></td<>	64 C1				='C:\Use	547	515	577	625	640	598	667	709	730	683	707	738	799		
14 (* 14) SummAd / SummA / SummQd   SummQD / Analys / Chartz / 2 / 2 / 2 / 2 / 2 / 2 / 2 / 2 / 2 /	65 C2	Manufacture of beve	rages & tobacco		178	140	118	172	197	160	127	183	197	160	129	205	221	181		
Keit 🖉										118	92	106	107	125	93		102			
tatt 📑	C C F H	SummAadj / SummA	SummQadj SummQ	SummQFD / /	inalysis 7 Ch	art2 🏸	1/ 200	000	200	2007	1.4	are		201	200	- 010	0.36	000		ъĒ
	Edit	3														m C	1009	6 O	- 6	
		A 1 - 1	<b>4</b> 6						-		14							-	14:39	

### New VAT traders already existing

G		Nun	nber	Gi -	omia		St	yles		5.9.				Ce	ells					
Qu	ality\	[PRO	C VAT FD.	xlsx]S	umn	IQFI	D'!Z	2118												
٨B		AC	AD	AE		AF	:		٩G		Α	Н		AI		A	Ŋ		AK	
File	4) • (4 • 4) Home		Layout Formulas D	ata Review	View	Developer		M VAT - N Document		cel		-	-			-				
Paste	✗ Cut ☑ Copy * ✓ Format Pain lipboard	Calibri B Z I	• 11 • A' A' I •   = •   $\frac{1}{20}$ • A • Font 5			Wrap Text Merge & Ci		Custom - % Num		- Conv Form	atting - a	Format s Table - Si ples		ert Delete	Format	E AutoSum Fill * Clear * I	Zſ	Find & Select *		
v	VEEKDAY	• (* × •	f ='C:\Users\Tim\D	ocuments\2 W	ork\C Traini	ng mater	ial\Qual	ity\[PRO	VAT FD.	xlsx]Sum	mQFD'!Z	118								¥
	L		R	c	7	ΔΔ	ΔR	ΔC	ΔD	ΔF	ΔF	ΔG	ΔН	Δ1	Δ1	ΔК	Δ1	ΔM	ΔN	
1	Quart	erly VAT o	data		2009	2009	2010	2010	2010	2010	2011	2011	2011	2011	2012	2012	2012	2012		
2	First o	eclaratio	ns		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
3					2009Q3	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2	2012Q3	2012Q4		
4					TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE		
111	Existin	g traders																		_
	A Numbers																			
112 CF	n numbers																			
114 T	Total				176	151	399	207	189	171	355	218	182	179	356	5 143	136	125		
115 A1	Agricultu	e and forestr	у				1	1	1	2				1						
116 A2	Livestock	& livestock pr	roducts; fishing			1.1		1.1	-	-					-	1				
117 80		d quarrying			1	1	1		-	2	1	-			1		1	2		
118 C1		ure of food pr			)'!Z118	4	3	2	1	3	7		4	•	5		1	1		
119 C2			ges & tobacco		-	1		1	-	-	1	1			1					
	H SummAad	SummA _	SummQadj / SummQ	SummQFD / A	nalysis 🦯 Ch	art2 🥂	1/*				14					Ĺ				Þ
Edit								_	_	_	_		_	_		100	10	10% —	1	-
<b>6</b>			2 🧿 😰		2	5				20						^ #	48	10 🤤 📤	14:51 15/08/20	15

# Adjusted turnover index

	Font G				AI	ignm	ent				ſ	5 -		Nun	nber		
/ f:	=Y10*(SummQ!Z64-	Z64	)/Su	ımm	nQ!Y	64											
	В			C	,		Z		AA	1		AB		AC	2	1	٩D
File	- Ci - Di Hall - Home Insert Page Layout Formulas Data R	eview	View D	Developer		AT - Micro cument Crea		-								ت <b>ا</b>	- e x
Paste V Clipb	Copy * Format Painter B I ∐ +   ⊕ +   ⊗h + A + ■ ■	Al	律 國 M ignment	/rap Text lerge & Cer		- % , Number	• *4 43 **	Condition	al Format al Styles	Cell - Styles -		lete Format	Σ Auto	. Z Sor	Find &		
WEE	EKDAY → (= X ✓ J* = ¥10*(SummQ1264-264)/S	C	64 7	۵۵	AB	AC	AD	ΔF	AF	AG	AH	AI	AL	AK	AL	AM	AN A
1 2 3	Quarterly VAT data		2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	
CPA	Adjusted turnover index (VAT traders) 2004 Q1 = 100																
T A1 A2	Total Agriculture and forestry Livestock & livestock products; fishing	427	197	232	304 210	195 268	134	129	194 235	167	144	130 351	171 251	127	126	117	
B0 C1	Mining and quarrying Manufacture of food products	704 442	461 =Y10*(Su	477	210 274 187	423	474	535 541 232	382	283 478 242	248 715 257	717 265	614 248	334 779 256	717	354 872 290	
1 C2 2 C3	Manufacture of beverages & tobacco Manufacture of textiles, clothing & leather	603 507	301 162	237 213	200 144	291 165	333 174	270 201	214 156	310 181	334 182	270 212	219 158	346 174	373 174	306 210	_
3 C4 4 C5	Manufacture of wood & paper products; printing Manufacture of petroleum, chemicals, rubber & plastic SummAadj / SummA SummQadj / SummQ / SummQF	481 467	193 196 Wsis / Cha	210 192	192 181	209 223	224 200	223 198	181 183	200	213 222	219 208	183 175	196 239	215	230 218	
dit 1		D Ana			_	-	-		_	-	-				100% 😑	- 15	÷12
🥑 [	R 🗎 🥝 🧕 🗉					-		T.S.						<b>4</b> 4 (	₩ <b>4</b> 0 <b>53</b>		8/2015

## Quarterly to annual aggregation

Annual VAT data     TRUE     TR	ont	Es.		Alig	nme	ent					5		Ν	lumbe	r	- Gi	
Image: State         SUM VAT - Microsoft Reel           Vert         Formula         Data         Review         Verw         Developer         Sum Nat - Microsoft Reel           K Off         Image: State         Image: State         Verw         Developer         Sum Nat - Microsoft Reel         Openational Formation         Sum Nat - Microsoft Reel         Sum	=1	F <mark>(G\$1,100*</mark> SUMIF(Sum	mQadj!	\$1:\$	51,G	\$2,	Sun	nm	Qad	j!1	0:10	)/Si	umm	Qadj	!\$C10,	NA()	)
A         A         Source         TRUE         TRU	в	SUMIF(rang	e, criteria,	[su	m_r	ang	e])		F		G		Н		1		J
Vis Coy - Premie       Vis Dest       Number       Constant	-		Review View D	eveloper				cel	-	-	-	-	-	-			
A       R       SUMP(range, citeria, lumm, range))       c       R       H       I       I       I       I       I       I       I       M       N       D       P       C       R       C         1       Annual VAT data       TRUE	Paste V	Copy * Format Painter B Z U * B - Å - E =	三 決決 図м			g - %		+3 Cor For	matting -	as Table -	Cell Styles -			Fill * Clear *	Sort & Find & Filter * Select *		
1     Annual VAT data     TRUE     TRUE<	WE	KDAY • (= X ✔ fr   =IF(G\$1,100*SUMIF(Sumr	nQadj!\$1:\$1,G\$2,Sur	nmQadji	10:10)/S	ummQa	dj!\$C10,M	NA())									۲
2       Adjusted turnover index (VAT traders)       2004       2005       2006       2007       2008       2009       2010       2011       2012         4       Adjusted turnover index (VAT traders)       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0	Δ 1	R SUMIF(range	criteria, [sum_range])	F	6	н	1	1	к	1	м	N	0	P	Q	R	A 2
2       Adjusted turnover index (VAT traders)       2004       2005       2006       2007       2008       2009       2010       2011       2012         4       Adjusted turnover index (VAT traders)       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0	1	Annual VAT data	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE						
4       Adjusted turnover index (VAT traders)         5       CPA       2004 C1 = 100         6       T       Total         7       All Agriculture and forestry       100       112       105       135       150       190       178       149       127         8       A2       Livestock Sitestock products; fishing       100       113       67       104       177       215       222       279       334         90       Mining and quarrying       100       113       67       104       117       215       222       279       334         101       C1       Manufacture of food products       100       108       107       121       146       181       187       206         11       C2       Manufacture of todo products       100       108       107       121       146       118       187       206         11       C2       Manufacture of todo products       100       108       107       121       146       181       187       206         12       C3       Manufacture of todo products       100       108       107       128       146       181       187       206       171	-																
5       CPA       2002 Q1 = 100         6       T       Total         7       Total         7       A1       Agriculture and forestry         100       112       105       135       150       190       178       149       127         8       A2       Livestock & Investock products; fishing       100       113       67       104       137       215       222       229       334         9       00       Mining and querrying       100       110       105       152       127       224       243       325       423         01       C1       Manufacture of food products       100       108       107       121       146       161       181       187       206         10       C1       Manufacture of todiumure of todiacco       100       108       107       121       146       181       187       206         12       C3       Manufacture of todiumure, chemical, inchemer Agenciacuts       100       108       107       121       146       181       187       206         12       C3       Manufacture of todiumure, chemical, inchemer Agenciacuts       100       108       100       128		Adjusted turnover index (VAT traders)	2004	2300	2000	2301	2000	2000	2010								
6       7       Total       7       Total       7       Total       7       A apriculture and forestry       100       112       105       135       150       170       174       144       127       144       127       144       127       144       127       144       127       144       127       144       127       144       127       145       127       126       127       127       124       243       325       423       145       1107       124       128       127       127       124       243       325       423       110       100       112       105       112       105       1107       124       124       325       423       110       110       101       105       102       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101       101 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td></td<>																	_
7       A1       Agriculture and forestry       100       112       105       135       150       190       178       149       127         8       A2       Livestock & Investock products; fishing       100       113       67       104       117       215       222       279       334         90       Mining and quarrying       100       112       107       117       215       222       279       334         101       113       67       104       117       117       225       242       335       423         101       104       152       170       124       243       325       423       325       423         101       105       1653.53       132       118       189       194       222       240         11       12       123       144       141       124       131       132       135       146       161       131       127       170       124       144       141         12       134       101       128       157       157       157       157       157       157       157       157       157       157       157       157																	_
8       A2       Uvestock & Fivestock products; fishing       100       113       67       104       172       215       222       279       334         9       00       Mining and quarrying       100       91       108       172       170       224       243       325       423         01       C1       Manufacture of food products       100       108       172       170       224       243       325       423         10       C1       Manufacture of oproducts       100       108       107       121       146       161       181       187       206         11       C2       Manufacture of oproducts       100       108       107       121       146       181       187       206         12       C3       Manufacture of oproducts       100       108       107       113       111       112       113       114       114       114       114       114       114       116       116       116       117       115       116       117       116       111       116       116       117       115       116       116       116       116       117       115       116       117			100	112	105	135	150	190	178	149	127						
9       80       Mining and quarrying       100       91       106       172       170       224       243       325       423         100       C1       Manufacture of food products       100       105       105       118       189       184       422       240         110       C4       Manufacture of food products       100       108       107       121       146       161       181       187       266         12       C4       Manufacture of textiles, dothing & leather       100       97       99       113       131       132       135       144       141         13       C4       Manufacture of textiles, dothing & leather       100       108       107       121       146       161       171         14       C5       Manufacture of other ono-metallic mineral products       100       107       115       139       131       132       135       144       141         15       C6       Manufacture of other ono-metallic mineral products       100       107       115       139       121       156       171       144       144       145       144       145       145       146       145       146       147 <td></td>																	
10     C1     Manufacture of food products     100     105     152     182     183     199     194     222     240       11     C2     Manufacture of baverages & tobacco     100     108     107     121     146     151     181     187     206       12     C3     Manufacture of toetings, clothing & leather     100     108     107     121     146     151     181     187     206       13     C4     Manufacture of toetings, clothing & leather     100     108     107     121     146     151     152     154     144     141       13     C4     Manufacture of toetings, chemicals, products; printing     100     108     107     121     158     172     180     180       14     C5     Manufacture of petrologues, chemicals, products     100     107     113     193     158     172     180     180       15     C6     Manufacture of petrologues, chemicals, products     100     114     89     123     163     178     187     203     207																	
11     C2     Manufacture of beverages & tobacco     100     108     107     121     146     161     181     187     206       12     C3     Manufacture of textiles, clothing & leather     100     97     99     113     112     135     144     141       13     C4     Manufacture of textiles, clothing & leather     100     107     128     157     158     176     169     171       14     C5     Manufacture of other non-metallic mineral products     100     107     115     139     191     156     120       15     C6     Manufacture of other non-metallic mineral products     100     114     89     123     163     178     187     203     207																	
13     04     Manufacture of wood & paper products; printing     100     108     110     128     157     158     176     169     171       14     05     Manufacture of petroleum, chemicals, rubber & plastics     100     107     115     139     151     156     172     180     180       14     05     Manufacture of petroleum, chemicals, rubber & plastics     100     107     115     139     151     156     172     180     180       15     14     Bannifacture of other non-metallic mineral products     100     114     192     168     178     187     203     207	11 C2	Manufacture of beverages & tobacco	100	108	107	121	146	161	181	187	206						
14       C3       Manufacture of petroleum, chemicals, rubber & plastics       100       107       115       139       191       156       172       180       180         15       C6       Manufacture of other non-metallic mineral products       100       114       89       123       163       178       187       203       207         14       ++       Manufacture of other non-metallic mineral products       100       114       89       123       163       178       187       203       207         164       ++       Manufacture of other non-metallic mineral products       100       114       89       123       163       178       187       203       207         164       ++       Manufacture of other non-metallic mineral products       100       114       89       123       163       178       187       203       207         164       ++       H	12 C3	Manufacture of textiles, clothing & leather	100	97	99	113	131	132	135	144	141						
15) G6 Mahufature of other non-metallic mineral products 100 114 89 123 163 178 187 203 207	13 C4	Manufacture of wood & paper products; printing	100	108	110	128	157	158	176	169	171						
H ++ H   SummAadi / SummQ / SummQ / SummQ / SummQ / Analysis / Oart2 / 9 / If III III III III III IIII IIII	14 C5	Manufacture of petroleum, chemicals, rubber & plastic	rs 100	107	115	139	191	156	172	180	180						
ter   🖾					89	123	163	178		203	207						-
		SummAadj / SummA / SummQadj / SummQ / SummQ	FD / Analysis / Char	12 / 12					14						IN THE ADDRESS (C		
	Edit				_	_	-		_		-	_			<u>□</u> <u>□</u> <u>100%</u> (=	_	

### **Estimating GVA**

- Another example workbook shows how estimates of GVA may be constructed for a given activity in a transparent manner
- The estimates are made at current and constant prices simultaneously, using value and quantity indicators to extrapolate a benchmark
- The country concerned did not have any quarterly or annual enterprise data

### Estimates of GVA

110		·····································	Data R	eview View			ument Creator	patibility Mode	I - microsoft (						
orm	Layout	Page Break Custom Pull Preview Views Streen Vorkbook Views Streen Sh	<ul> <li>Formula Bar</li> <li>Headings</li> <li>row</li> </ul>	Q 200m 100 20	Zoom to Selection	New Arran Window A	nge Freeze	Hide (1)	View Side by S Synchronous S Reset Window Andow	icraiting	Save Swit	tch Macros			
-	H15	• (* fr =H27/1000	0			F	0				14				0
	A	B	C	D	E	F	G	H	1	J	К	L	M	N	0
		Quarterly estimates			2006	2006	2006	2006	2007	2007	2007	2007	2008	2008	2008
		Production account	ISIC	2006	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
		Chemicals, etc	DE												
	check	,													
			BM	2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007Q4	2008Q1	2008Q2	2008Q3
		Current prices			1200										
		Total output at basic prices		19.0	4.6	4.7	4.9	4.8	4.7	4.9	5.2	5.0	5.2	5.7	6.0
		less Intermediate consumption		11.5	2.8	2.9	2.9	2.9	2.9	3.0	3.1	3.0	3.1	3.5	3.7
) 1		GVA at basic prices		7.5	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.3	2.4
2		Constant prices													
3		Total output at basic prices													
		less Intermediate consumption													
5		GVA at basic prices		7.5	1.8	1.8	2.0	1.8	1.8	1.9	2.0	1.8	1.8	1.9	2.0
5 7															
3		Quantity index numbers		100	24	25	27	24	24	25	27	24	23	26	26
ŝ		Change		100	24	20	21	24	1%	3%	-1%	-1%	-4%	0%	-19
)		Deflator		100	100	101	96	104	102	102	103	108	116	118	122
2		-													
3		Formal GVA Informual GVA		6.8 0.7	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	2.1	2.2
1				0.7	0.2	0.2	0.2	0.2		0.2		0.2	0.3	0.2	0.2
		/ data / Soap / 😡 /							14	_		_	(m) (m) (m)	120% (=)	
1			_		Pa	-	_	_		_	_				12:38

### GVA at constant prices

	Raor Raor		Zoom 102% Z		Arrange Freeze	Unhide	View Side by Side Synchronous Scrot Reset Window Poo Indow	Save	Switch Windows - Mar	01		
	fs.	=\$C29*H63/\$D6	53	_	E	F	G	Н	1	J	К	L
1		Quarterly estimates			2006	2006	2006	2006	2007	2007	2007	200
3		Production account	ISIC	2006	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4		Chemicals, etc	DE									
5	check		1.000									
6	uncon		BM	2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007
26			Divi	2000	2000Q1	2000022	200045	2000Q1	200/ 21	2007 92	2007.00	2007
27	TRUE	Gross value added KP	7,478	7,478	1,809	1,842	2,003	1,823	1,831	1,904	1,984	1,8
28	TRUE	Soap	855	855	212	208	238	198	152	238	281	1
29	TRUE	Other chemicals etc	5,905	5,905	1,421	1,457	1,576	1,452	1,524	1,475	1,493	1,4
30	TRUE	Informal	717	717	177	177	190	174	155	192	210	1
31	TRUE	New/adjust	0	0	0	0	0	0	0	0	0	
32												
33	TRUE	Gross value added CP	7,478	7,478	1,810	1,859	1,915	1,893	1,867	1,937	2,044	1,9
34	TRUE	Soap	855	855	212	210	227	206	156	243	290	
35 36	TRUE	Other chemicals etc Informal	5,905	5,905	1,421	1,471	1,506	1,507	1,554	1,500	1,538	1,5
30 37	TRUE	New/adjust	0	717	0	178	181	180	158	195	217	
20			0	0	0	U	-	0		0	0	
eads	H DE da	ta / Soap / 😏 /					•				150%	-:0 (

## Intermediate consumption

File	Home Page Page	📔 🔲 🖾 Ruler 🗵 Formula B	. 9 1	Developer La		Spitt (1) Hide (1)	riew Side by Side Synchronious Scrott Reset Window Pop	Sauce	Switch Mac		a (	0083
	fx	=H53*H47				W	indow		Mac	ros		
-		[Famard	. D]		E	F	G	Н	1	J	К	L
1 2		Quarterly estimates			2006	2006	2006	2006	2007	2007	2007	200
3		Production account	ISIC	2006	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4		Chemicals, etc	DE			•						
	check											
6			BM	2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007
38	-											
39	TRUE	Intermediate consumption	11,474	11,474	2,778	2,853	2,938	2,905	2,865	2,972	3,136	3,0
0	TRUE	Soap	1,312	1,312	325	323	349	316	239	372	445	2
1	TRUE	Other chemicals etc	9,061	9,061	2,181	2,257	2,311	2,313	2,384	2,301	2,359	2,4
2	TRUE	Informal	1,100	1,100	272	274	278	276	243	299	332	2
3	TRUE	New/adjust	0	0	0	0	0	0	0	0	0	
4												
5		IC ratio	61%									
6		Soap	61%	61%	61%	61%	61%	61%	61%	61%	61%	6
7		Other chemicals etc	61%	61%	61%	61%	61%	61%	61%	61%	61%	6
8		Informal	61%	61%	61%	61%	61%	61%	61%	61%	61%	6
9		New/adjust		0%	0%	0%	0%	0%	0%	0%	0%	
ady		ta / Soap / 💱 /					14					+0

## Total output and value indices

orea	in the second s	=\$C54*H59/\$D5	Zoon 100% Zo	및 신	Amanda Tours	Unhide	View Side by Side Synchronous Scrat Reset Window Pop Indow	Lave	Switch Windows + Mac	305		
4	• J.a	-3034 1133/303	/J		E	F	G	Н	1	J	К	L
2		Quarterly estimates			2006	2006	2006	2006	2007	2007	2007	200
3		Production account	ISIC	2006	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1		Chemicals, etc	DE	2000	21	22	25	21	21	24	25	Q
5	check											
5			BM	2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007
0						•						
1	TRUE	Total output CP	18,952	18,952	4,588	4,712	4,853	4,799	4,733	4,909	5,180	4,9
2	TRUE	Soap	2,168	2,168	537	533	576	521	394	615	734	4
3	TRUE	Other chemicals etc	14,967	14,967	3,602	3,727	3,817	3,820	3,938	3,800	3,897	4,0
4	TRUE	Informal	1,817	1,817	450	452	459	=\$C54*H5	401	494	549	6
5	TRUE	New/adjust										
6												
7		Value indices										
8		Other chemicals etc		100	24	25	26	26	26	25	26	
9		Informal		100	25	25	25	25	22	27	30	
0												
1		Quantity indicators										
3	H DE da	ta / Soap / 😏 /	1 1	100	25	24	14		10	20	22	
it	-									m 🖬 🖽	150% -	-((

### Quantity and price indicators

Tite		Insert Page Layout Formulas Data	and the second s		ber & plastics (Co ty Document Creat	112200000000006666	- Microsoft Exce	_		_		0 ×
lorma	F	E Break Custom Full (7) Continuer (7) Homelia Ba	· ? []	関 包 south How	Arrange Treeze All Panes -	Unhide	View Side by Side Synificanous Scrol Reset Window Poo Andow	Calur	Switch Windows *	705		
		=100*H58/H69			E	F	G	Н	1	J	К	L
1 2	-	Quarterly estimates			2006	2006	2006	2006	2007	2007	2007	200
3		Production account	ISIC	2006	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4		Chemicals, etc	DE				•					
5	check											
6			BM	2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007
58		Other chemicals etc		100	24	25	26	26	26	25	26	
59		Informal		100	25	25	25	25	22	27	30	
60												
1		Quantity indicators										
2		Soap		100	25	24	28	23	18	28	33	
3		Other chemicals etc	V/P	100	24	25	27	=100*H58/	26	25	25	
4		Informal	100%	100	25	25	26	24	22	27	29	
5		Soap	50%	100	25	24	28	23	18	28	33	
6		Population	50%	100	25	25	25	25	25	26	26	
7 8		Price indices (Basic prices)										
8 9		Other chemicals etc	data	100	100	101	95	104	102	102	103	1
0	-	Informal	uala	100	100	404	05	104	102	102	103	
() It	PH DE C	data / Soap / 🕲 /								m 🗉 🖽		· · · ·
					-	-	1000			• 15 of 9		13:00

### Data sheet

em	Layout I	ge Break Custom Pull Preview Views Screen ↓ Gridlines ↓ Abook Views Sch	*	Zoom 1	2 Zoom to		ange freeze	Hide	L) View Side by 1) Synchronous	Scrotting	Save Su	atch Macro			
	H23	• (* 🍂 ='C:\Users\Tim	\Documen	ts\2 Work\C	enera	al\[D/	ATA P	PI.xl	s]Sun	nmary	y'!H2:	2			0
ŝ	A	В	C	D BM Year	(c		1					-	M	N	0
		Quarterly estimates		Dimitedi	2006	2006	2006	2006	2007	2007	2007	2007	2008	2008	2008
		Production data	ISIC	2006	01	Q2	03	04	01	02	Q3	Q4	Q1	Q2	Q3
		Chemicals, etc	DE	2000	4.	de.	45	41	4.	4-	45	Q.I	4.	4-	45
		Chemicals, etc	DE												
			-	2000	2000001	200000	200002	200004	200701	200702	200702	200704	200004	200002	200002
				2006	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007Q4	2008Q1	2008Q2	2008Q3
i.		Soap									-				
		Quantities		6.428	1,590	1.565	1,786	1.488	1,145	1,790	2,112	1,300	2.698	1.317	1.342
0		Value (estimated)		2,168	537	533	576	521	394	615	734	476	1.060	523	551
1		Alternative price	3.379		338	341	323	351	344	343	348	366	393	397	410
2															
3		Other chemicals													
4		VAT data		17,134	4,139	4,260	4,393	4,342	4,332	4,415	4,631	4,527	4,442	5,203	5,510
5		Chemicals		8,596	2,215	2,254	2,155	1,971	2,055	2,038	2,116	1,900	2,105	2,514	2,565
3 7		Rubber and plastics Total excluding soap		8,539 14,967	1,924 3,602	2,006	2,238 3,817	2,371 3.820	2,277 3,938	2,377 3,800	2,515 3,897	2,627 4,051	2,337 3,382	2,689 4,680	2,945 4,959
3		Total excloding soap		14,907	3,002	3,121	3,017	3,020	3,930	3,000	3,097	4,001	3,302	4,000	4,909
9	Populatio	Total pop index		100	25	25	25	25	25	26	26	26	26	26	26
ĵ	, opulate	i ona pop maon													
1		Price indices (Basic prices)													
2		Producer price for chemicals, etc	218	100	100	101	95	104	102	102	103	108	116	118	121
		Chemicals	172	100	101	102	94	103	101	101	102	109	118	119	119
1		Plastics	45	100	95	97	102	105	104	103	105	107	108	113	129
(		data / Soap / 😒 /							14						÷
d	у 🎦												- 0 0 0	] 120% 😑 🗌	- 0

# Soap data

	-	Home Insert Page Layout	Formulas Dat	And Address of the Owner of the	2006 PQ DE Che		& plastics (Co	142200000000000000000000000000000000000	ide] - Micri	osoft Excel				-		<b>*</b>
	at Page	President Cutor ful	Pormulas Dat     P	nula Bar - 🍳	View Develo	-2		Split.		neus Scrotting		witch ndows + Mac	05			2 14 14
	WEE	sUMIF(\$A\$	514:\$A\$	25,\$B11	L,K\$14	1:K\$2	5) <sub>H</sub>	1	J	K	L	M	N	0	Р	P
1 2		Soap (Total)	T													
3 4			1999	2000	2001	2002	2003	2004	2005	2006	2007	2005	2009	2010		
5 6 7		Quantity (tonnes)	6,39	3 5,818	6,299	7,793	7,146	6,235	#N/A	6,428	6,348	6,676	3,767	#N/A		-
8		Q1 Q2	1,50		1,341	1,978	1,966 1,739	1,555	#N/A #N/A	1,590	1,145	2,698	1,258	#N/A #N/A		
10		Q2 Q3 Q4	1,66	3 1,565	1,832	2,175	1,902	1,612	#N/A #N/A	1,786 =SUMIF(S	2,112	1,342	784	#N/A #N/A		
23		47	1,04	5 1,000	1,035	1,020	1,000	1,412		-oomr (a	1,000	1,010	315	min		
4	Q1 Q1	Jan Feb	52 49		501 343	721	908 502	575 457	#N/A #N/A	578 481	400 <b>`</b> 341	1,066	497	#N/A #N/A		
6	Q1 Q2	Mar Apr	48	5 516	497 460	601 640	556 597	523 518	#N/A #N/A	530	404	774 519	336	#N/A #N/A		
8 9	Q2 Q2	May Jun	49	1 552	473	553 628	554 587	526 554	#N/A #N/A	514 542	612 706	431	241	#N/A #N/A		
0	Q3 Q3	Jul Aug	59	4 581	643 652	746 739	711 714	539 593	#N/A #N/A	669 487	778 805	451 452	289 - 247 -	#N/A #N/A		
2	Q3 Q4	Sep Oct	53	8 460	537 673	689 851	477	480	#N/A #N/A	630 492	529 470	439	248 295	#N/A #N/A		
4	Q4	Nov	51	9 345	636 386	527 442	464 512	479	#N/A #N/A	479	397 433	463 458	299 299 381	#N/A #N/A		
		DE / data   Soap / 🖓 /	43	2 310	300	442	512	517	#19//4	1 0101	=	400		120% -	1	-
-		🧕 📋 🤮	<b>o</b>		Pa	-		-	13 13					<b>₩ 40 53</b>		8:16 8/2015

### **Questions for discussion**

- Apart from the caveats mentioned, what other problems would you face in exploiting VAT data?
- What are the main quality characteristics of the GVA estimates in the example?
- How transparent is your estimation system?