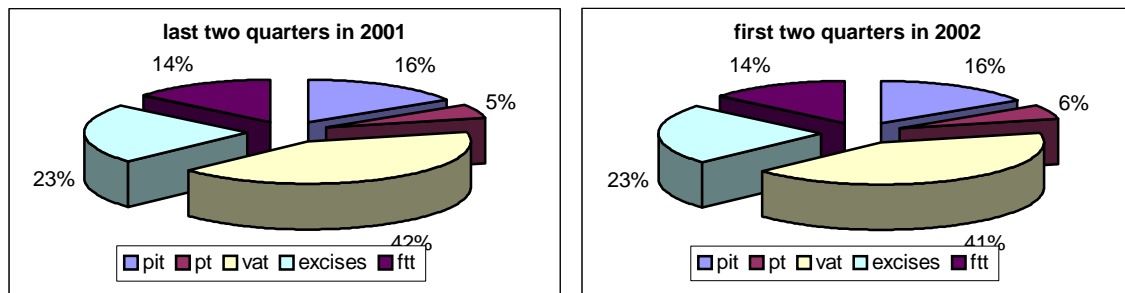


**SIMULATION ON THE FTT TERMINATION
AND THE VAT**
Marjan Nikolov, MSc
USAID Fiscal Reform Project

The views expressed in this paper are those of the author and do not necessarily represent those of the Bearing Point and Bearing Point Policy. This paper is published to further debate.

The FTT in Macedonia entered into force in July 2001 for reasons to enhance the revenue collection due to the higher Government expenditures caused by the War activities. By a law FTT will be on force till 31st of December 2002. The FTT contribution for the last two quarters of the last year and the first two quarters of this year in the total tax revenue collection is presented in the next figure¹.



The 14 % contribution of the FTT as a share from the total tax collections gives reason to consider the effect on the revenue side of the budget when the FTT will be terminated. If it is agreed that the VAT should take the burden of the FTT collection then the question is what changes to the VAT tax rates and/or tax base should be done. VAT was implemented in April 2000. This tax has a general tax rate of 19 % and a reduced tax rate of 5 %. The 19 % and the 5 % share of the tax base and calculated VAT are presented in the next table. You can see immediately that the 19 % tax base share in the total tax base is 60 % for the period and the 5 % share is 40 %. The 19 % calculated VAT in the total VAT calculation contributes with 85 % in the total and the 5 % calculated VAT with 15 % in the total.

VAT tax base and calculated VAT for the first two quarters in 2002 (mln MKD)					
Total	Total	19% tax base		5% tax base	
Tax base	VAT	19% tax base	19% VAT	5% tax base	5% VAT
75465	10089	45258	8573	30207	1516
Share in total:		60%	85%	40%	15%

The following technique was used in order to simulate the VAT tax rates and/or tax base changes if the VAT takes over the burden of the FTT collections after the FTT is terminated. The FTT collections were added to the VAT collections for the period 2001:7-2002:6 on quarterly bases and the two time series (VAT only series and VAT+FTT series) were compared. The VAT plus FTT series shows values higher from

¹ PIT (personal income tax); pt (profit tax); VAT (Value added tax); FTT (Financial transaction tax).

32%-37% compare to the VAT only series. That means that the VAT collections should be higher for about the same amount (32%-37%) ceteris paribus if the VAT takes the burden of the FTT termination.

The next step, after we know by how much we should increase the VAT collection, is to simulate what tax rates and/or tax bases we need in order to achieve the 32%-37% higher VAT collections. What follows is a result from the simulation.

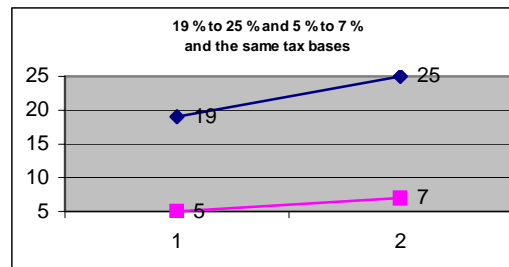
SENSITIVITY ANALYSES AND POSSIBLE COMBINATIONS OF VAT BASE AND TAX RATES

In total the sensitivity analyses comprise 6 simulations: with 30%, 32%, 34%, 36%, 38% and 40% increases in the VAT collection and what will be the effect to the tax rates and/or tax bases. For each of these 6 simulations different combinations were considered.

1. 30 % increase in the VAT collections;

a. Tax base remain the same; both tax rates increases:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13115.7	45258	11148	30207	1967
		25%		7%	
share in total		60%	85%	40%	15%

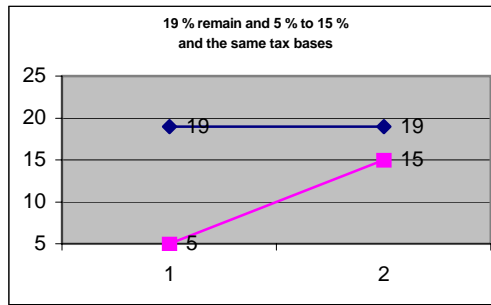


b. Tax rates remain the same; this is trivial simulation. The result is to increase both tax bases by the 30 %².

c. 19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13115.7	45258	8599	30207	4517
		19%		15%	
1.00		1.00		1.00	
share in total		60%	66%	40%	34%

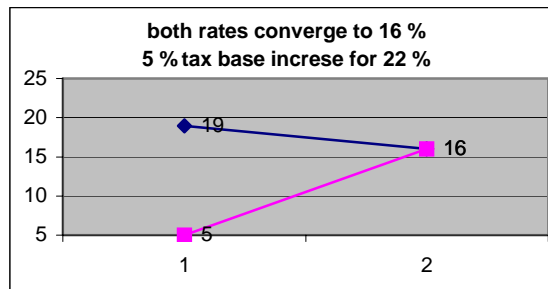
² The same apply to the percentage increases in the other simulations.



d. The 19 % converges to the 16 % as from the case c. above, but with the same tax base:

total	19% tax base	5% tax base
tottaxbase	19%taxbase	5%taxbase
81973	45258	36715
totvat	19%vat	5%vat
13115.7	7241	5874
	16%	16%
1.09	1.00	1.22
share in total	55%	45%
	55%	45%
	share in total	

In this combination the 5 % tax base must increase for about 22 %; hence the total tax base will increase for about 9 %.



2. **32 % increase in the VAT collections;**

a. Tax base remain the same; both tax rates increases:

total	19% tax base	5% tax base
tottaxbase	19%taxbase	5%taxbase
75465	45258	30207
totvat	19%vat	5%vat
13317.48	11320	1998
	25%	7%
share in total	60%	40%
	85%	15%

- b. **19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:**

total	19% tax base		5% tax base		
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13317.48	45258	8599	30207	4718
		19%		16%	
1.00		1.00		1.00	
share in total		60%	65%	40%	35%

- c. **The 19 % converges to the 16 % as from the case c. above, but with the same tax base:**

total	19% tax base		5% tax base		
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
83234	13317.48	45258	7241	37976	6076
		16%		16%	
1.10		1.00		1.26	
share in total	54%	54%	46%	46%	share in total

In this combination the 5 % tax base must increase for about 26 %; hence the total tax base will increase for about 10 %.

3. **34 % increase in the VAT collections;**

- a. **Tax base remain the same; both tax rates increases:**

total	19% tax base		5% tax base		
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13519.26	45258	11491	30207	2028
		25%		7%	
share in total		60%	85%	40%	15%

- b. **19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:**

total	19% tax base		5% tax base		
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13519	45258	8599	30207	4920
		19%		16%	
1.00		1.00		1.00	
share in total		60%	64%	40%	36%

- c. The 19 % converges to the 16 % as from the case b. above, but with the same tax base:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
84494	13519	45258	7241	39236	6278
		16%		16%	
1.12		1.00		1.30	
share in total	54%	54%	46%	46%	share in total

In this combination the 5 % tax base must increase for about 30 %; hence the total tax base will increase for about 12 %.

4. **36 % increase in the VAT collections;**

- a. Tax base remain the same; both tax rates increases:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13721.04	45258	11663	30207	2058
		26%		7%	
share in total		60%	85%	40%	15%

- b. 19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13721.04	45258	8599	30207	5122
		19%		17%	
1.00		1.00		1.00	
share in total		60%	63%	40%	37%

- c. The 19 % converges to the 16 % as from the case b. above, but with the same tax base:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
85757	13721.04	45258	7241	40499	6480
		16%		16%	
1.14		1.00		1.34	
share in total	53%	53%	47%	47%	share in total

In this combination the 5 % tax base must increase for about 34 %; hence the total tax base will increase for about 14 %.

5. 38 % increase in the VAT collections;

a. Tax base remain the same; both tax rates increases:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13922.82	45258	11834	30207	2088
		26%		7%	
share in total		60%	85%	40%	15%

b. 19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	13922.82	45258	8599	30207	5324
		19%		18%	
1.00		1.00		1.00	
share in total		60%	62%	40%	38%

c. The 19 % converges to the 16 % as from the case b. above, but with the same tax base:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
87018	13922.82	45258	7241	41760	6682
		16%		16%	
1.15		1.00		1.38	
share in total	52%	52%	48%	48%	share in total

In this combination the 5 % tax base must increase for about 38 %; hence the total tax base will increase for about 15 %.

6. 40 % increase in the VAT collections;

a. Tax base remain the same; tax rates increases:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	5%vat
75465	14124.6	45258	12006	30207	2119
		27%		7%	
share in total		60%	85%	40%	15%

b. 19 % tax base and tax rate remain the same; all changes in the 5 % tax rate:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	
75465	14124.6	45258	8599	30207	5526
		19%		18%	
1.00		1.00		1.00	
share in total		60%	61%	40%	39%

c. The 19 % converges to the 16 % as from the case b. above, but with the same tax base:

total		19% tax base		5% tax base	
tottaxbase	totvat	19%taxbase	19%vat	5%taxbase	
88279	14124.6	45258	7241	43021	6883
		16%		16%	
1.17		1.00		1.42	
share in total	51%	51%	49%	49%	share in total

In this combination the 5 % tax base must increase for about 42 %; hence the total tax base will increase for about 17 %.

A casual inspection of the simulation above can show us more about the total collection increase elasticity of the tax base behavior as well as the total collection increase elasticity of the tax rate behavior. This is illustrated in the next table.

All numbers in % Increasing in the collection	Both tax bases remain the same. Changes in the tax rates		Changes only in the reduced tax rate (both tax bases remain the same)		The general tax rate converge to the reduced tax rate (no change in the general 19 % tax base)			
					Tax rates converged in one 16 % tax rate		Increase in the reduced 5% tax base	Increase in the total tax base
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
30	25	7	19	15	16	16	22	9
32	25	7	19	16	16	16	26	10
34	25	7	19	16	16	16	30	12
36	26	7	19	17	16	16	34	14
38	26	7	19	18	16	16	38	15
40	27	7	19	18	16	16	42	17

What we can see from the table above is that if both VAT tax bases remain constant and if we allow only for the tax rates to change (while keeping the same shares from the 19 and 5 percent in the total tax base and total collection) the reduced tax rate of 5 % move to 7 % at once and is not elastic to further increases in the total collection increases (columns (1) and (2) in the table).

In the combination where the changes are only in the reduced tax rates (both tax bases remain the same), while keeping the general tax rates constant, the 5% tax rate move to 15 % immediately and then for each 2 % points increase in the total tax collection it increases for less than 1 % point. Thus, the total tax collection increase elasticity of reduced tax rate is relatively low (columns (3) and (4) in the table).

If the both tax rates converge to 16 % (and if the tax base of the general tax rate remain constant) then the tax base of the reduced tax rate should increase for 4 % points for each 2 % points increase in the total tax revenue collection. This affect the total tax base to follow an elasticity of 2 % points increase in the total tax base for each 2 % points increase required in the total tax collection (columns (5), (6), (7) and (8) in the table).

Conclusion is that the most sensitive variable to a change in the requirements for the total VAT collection is the tax base of the reduced tax rate. Of course that different combinations (changes in both tax bases jointly with changes in both tax rates) will yield a different results. In this paper only the basic combinations were considered.

The combinations of increasing both tax rates while keeping the tax bases constant faces low elasticity in the increase requirements but the general tax rate increase to relatively high 25%-27% (column (1) in the table).

The combinations where the reduced tax rate increases *ceteris paribus* converge to a 19 % solution for both tax rates with the increasing of the collection requirements (columns (3) and (4) in the table).

Maybe the best combinations are to reduce the general tax rate to 16 % and to increase the reduced tax rate to the same 16 % with a combination of increasing the reduced tax base that will affect the total tax base as well (columns (5) and (6) in the table).

The optimistic scenario is when the requirements are 32 % increase in the total VAT collections (supported by the actual data) and then go for a one tax rate of 16 % with increasing the 5 % tax base for about 26 % and this will cause the total tax base increasing for about 10 %. This is the simulation 2.c from above.

The pessimistic scenario is when the requirements are 38 % increase in the total VAT collections (supported by the actual data) and then go for a one tax rate of 16 % with increasing the 5 % tax base for about 38 % and this will cause the total tax base increasing for about 15 %. This is the simulation 5.c. from above.