

EQUIFINALITY IN THE VALUE ADDED TAX SYSTEM

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Introduction

Equifinality is the equality in final achievement in a system by different means. It has often been referred to as multicausality, which means that there may be a multiple number of initial causes but at the end, the final accomplishment will be the same for any of these causes. In this chapter, it will be examined how in the Value Added Tax (VAT) system there exist the systemic feature of equifinality. Equifinality can be used as a significant tool to analyze the VAT system from the viewpoints of various system inputs and thereby the system can be made flexible to any pressure group's interest as well as the economic policy of a new political government. With proper understanding and application of the systemic feature of equifinality in the VAT system, we can maximize revenue output with minimum cost. To achieve a desired certain percentage of revenue growth, costs of several inputs can be assessed and their possible outcomes can be evaluated. A comparatively better policy measure (input) can be adopted towards achieving the desired level of revenue growth (output). For instance, three separate inputs to achieve 30 percent growth in the collection of VAT can be individually ascertained. Those are 10 percent increase in the administrative manpower in the VAT system or 15 percent increase in logistics support (transportation, radio-communication, use of defensive firearms, sophisticated technological office equipments etc.) to the existing manpower or motivation of the VAT concerned people (both VAT-payers and VAT-collectors) at the cost of 3 percent VAT revenue earned. Any of these three inputs supposedly may lead to 30 percent growth of VAT collection (final output). There may exist more alternatives hidden inside the VAT system to achieve the objective of equal percentage of revenue growth. Study regarding the feasibility of these types of alternatives merits attention for understanding the VAT system and producing significantly more revenue out of the system. This article is organized into three sections examining three different mechanisms (each with an alternative) through which the VAT system maintains equifinality. The article is concluded with an assertion that with more efforts on the part of researchers and practitioners with regard to the systemic characteristic of equifinality embedded in the VAT system – the system can be made a more effective revenue generating machine.

Additive Method vs Subtractive Method

- The tax liability of a registered person under the VAT system can be assessed either with an *additive method* or a *subtractive method*. Under the *additive method*, the tax-base i.e. *value addition* of the VAT is the sum total of all

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conversion costs¹ and profit. The VAT-liability is assessed by applying the rate of VAT on this value added. Under the *subtractive method*, a subtraction formula is used where the preceding value of the goods or services is deducted from the current final value to determine the *value addition* and the rate of VAT is applied upon this value addition to ascertain the VAT-liability. Under the *subtractive method*, the value added is thus computed by deducting 'input value' from 'output value' (Shoup, 1990: 7-10; Tait, 1988: 4). The *subtractive method* at its final form is also known as 'credit method' or 'invoice method'. Whatever is the method of computing the tax-base or VAT payable, final result of VAT-liability under both the computing methods shall be equal. This amply proves that the ideal VAT system has the characteristics of equifinality.

- If we assume C for conversion cost, π for profit, I for input value, O for output value, VA for value added, t for tax rate for VAT, and VL for VAT-liability, then, $VA = C + \pi$ and $VL = t \times VA = t \times (C + \pi)$ under the additive method. Under the subtractive method, $VA = O - I$ and $VL = t \times VA = t \times (O - I) = (t \times O) - (t \times I) = \text{output VAT} - \text{input VAT}$. However, for subtraction or additive purpose, VAT is not included in the input value or output value.
- For instance, we assume one importer will import some goods, which will be supplied to a producer. The producer will produce goods by using the imported goods and the produced goods will be supplied to a wholesaler. The wholesaler will supply the goods to a retailer who will sell it to an ultimate consumer. It is also assumed that the whole distribution-process will be an unbroken one. The importer imported some goods at Taka 800 (ex-VAT), on which he paid Taka 120 as VAT at 15 percent rate. Then he employed Taka 100 as conversion cost and Taka 100 as profit to sell the imported goods to a producer at Taka 1,000 (ex-VAT) and the importer collected Taka 150 from the producer as output-VAT. The value added at import-stage before further sale, was Taka 800 and then at the stage of further sale Taka 200 (= conversion cost Taka 100 + profit Taka 100). The importer paid Taka 120 (= 15 per cent of Taka 800) at import stage and Taka 30 at supply-stage to producer [= (output VAT Taka 150 collected from the producer – input VAT Taka 120 paid at import-stage) or (value added Taka 200 at supply-stage multiplied by 15 percent rate of VAT)] i.e. total Taka 150 is paid to the national exchequer.
- If the producer, with his raw-material cost of Taka 1000 (ex-VAT), employed Taka 800 as conversion cost and Taka 200 as profit to sell the produced goods to a wholesaler at Taka 2,000 (ex-VAT), the producer collected Taka 300 from the wholesaler as output-VAT. The value added at production-stage before sale, was Taka 1000 (= conversion cost Taka 800 + profit Taka 200). The producer paid Taka 150 [= (output VAT Taka 300 collected from the wholesaler – input VAT Taka 150 paid at purchase from importer) or (value added Taka 1000 at production-stage multiplied by 15 percent rate of VAT)] to the Government Treasury.

¹ *Conversion cost* refers to the cost incurred to convert raw materials into finished goods excluding profit.

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- If the wholesaler, with his goods purchased from the producer at Taka 2000 (ex-VAT), employed Taka 150 as conversion cost and Taka 50 as profit to sell the goods to a retailer at Taka 2200 (ex-VAT), the producer collected Taka 330 from the retailer as output-VAT. The value added at supply to retailer before sale, was Taka 200 (= conversion cost Taka 150 + profit Taka 50). The wholesaler paid Taka 30 [= (output VAT Taka 330 collected from the retailer – input VAT Taka 300 paid at purchase from producer) or (value added Taka 200 at production-stage multiplied by 15 percent rate of VAT)] to the national exchequer.
- If the retailer, with his goods purchased from the producer at Taka 2200 (ex-VAT), employed Taka 50 as conversion cost and Taka 50 as profit to sell the goods to a consumer at Taka 2300 (ex-VAT), the producer collected Taka 345 from the consumer as output-VAT. The value added at sale to consumer before sale, was Taka 100 (= conversion cost Taka 50 + profit Taka 50). The retailer paid Taka 15 [= (output VAT Taka 345 collected from the consumer – input VAT Taka 330 paid at purchase from wholesaler) or (value added Taka 100 at production-stage multiplied by 15 percent rate of VAT)] to the Government Treasury. Thus, the overall deposit to the Government Treasury is Taka 345 [= Taka 150 by importer + Taka 150 by producer + Taka 30 by wholesaler + Taka 15] paid by the ultimate consumer.
- Thus, it can be conceived from the above illustrations that under *additive method*, ‘value-addition’ at each stage is computed by adding conversion cost with profit and under *subtractive method*, ‘value added’ at each stage is computed by subtracting ‘input value’ from ‘output value’. For the whole import-production-distribution process the total prices stands at Taka 2,300 [= Taka 800 at import-stage + Taka 200 at supply to producer + Taka 1,000 at production-stage for supply to wholesaler + Taka 200 at supply to retailer + Taka 100 at supply to ultimate consumer] and the VAT payable will be Taka 345 [=Taka 2,300 multiplied by 15 percent] and the final total VAT collected by the VAT authority is Taka 345 [= Taka 2,300 multiplied by 15 percent]. Under the *subtractive method*, VAT-liability can also be computed by deducting ‘input-VAT’ from ‘output-VAT’ and the final total VAT paid by the importer, producer, wholesaler and retailer is Taka 345 [= (Taka 120 at import stage + Taka 30 at supply to producer) + Taka 150 at production-stage + Taka 30 at supply to wholesaler + Taka 30 at supply to retailer]. The above numerical description has been shown in the following Table # 1.

Table # 1: Value Added and VAT Payable

	Raw Material / Input Value (Taka)	Conversion Cost (Taka)	Profit (Taka)	Value Added (Taka)	Output Value (Taka)	Input-VAT (Taka)	Output -VAT (Taka)	VAT payable (Taka)
Importer-Import	800	---	---	800	800	---	120	120
Importer-Supplier	800	100	100	200	1,000	120	150	30

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Producer	1,000	800	200	1,000	2,000	150	300	150
Wholesaler	2,000	150	50	200	2,200	300	330	30
Retailer	2,200	50	50	100	2,300	330	345	15
Consumer	2,300					345	n/a	
Total		<u>1,100</u>	<u>400</u>	<u>2,300</u>	<u>2,300</u>			<u>345</u>

Origin Principle vs Destination Principle

- The VAT can be assessed and collected based on either origin principle or destination principle. A VAT is said to have used the origin principle when it taxes the value that is added domestically to all goods, including goods that are subsequently exported, but does not tax the value that has been added abroad and is embodied in goods that are imported and sold domestically. In contrast, a VAT is said to have used the destination principle when it taxes all value added, at home and abroad, to all goods that have as their destination the consumers of that country and consequently, exports are exempted and imports are taxed (Shoup, 1990: 7). In a restricted economy having no export and import, there will be no distinction between destination principle and origin principle and equifinality will work by generating equal revenue under any of the principles. But in an open economy, the characteristic of equifinality exists from the global point of view.

- For example, the world is divided into four countries: Country A, Country B, Country C and Country D. The production quantities in the countries subject to taxation under the VAT system are: Taka 5,000 million in Country A, Taka 4,000 million in Country B, Taka 3,000 million in Country C and Taka 6,000 million in Country D. In the absence of any sort of international trade (i.e., when the countries have only closed economy), assuming a tax rate of 15 percent, total VAT collected to be Taka 2,700 million [= Taka 18,000 million × 15 percent]. The country-wise VAT collection would be: Taka 750 million in Country A, Taka 600 million in Country B, Taka 450 million in Country C and Taka 900 million in Country D. In a closed economy, since export and import are not allowed, origin and destination are same, and equifinality works under either method. But when the countries involve in international trade, VAT is to be paid by each country only on import and part of the production that is not exported under *destination principles*. Under the *origin principle*, total production in each country is subject to taxation and both import and export are not subject to taxation. We assume that Country A exports total Taka 1,100 million: Taka 500 million to Country B, Taka 400 million to Country C and Taka 200 million to Country D. Country B exports total Taka 500 million: Taka 200 million to Country A and Taka 300 million to Country C. Country C exports total Taka 600 million: Taka 100 million to Country B and Taka 500 million to Country D. Country D exports total Taka 1,100 million: Taka 500 million to Country A and Taka 600 million to Country B. Thus, individual country's consumption [assuming to be equal to sum total of production and import reduced by the exports] would be: Taka 4,600 million in Country A, Taka 4,700 million in Country B, Taka 3,100 million in Country

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C and Taka 5,600 million in Country D. Thus, under *origin principle*, the country-wise VAT collection would be: Taka 750 million in Country A [= Taka 5,000 × 15 percent], Taka 600 million in Country B [= Taka 4,000 × 15 percent], Taka 450 million in Country C [= Taka 3,000 × 15 percent] and Taka 900 million in Country D [= Taka 6,000 × 15 percent]. And total VAT collected would be Taka 2,700 million [= Taka 750 million + Taka 600 million + Taka 450 million + Taka 900 million]. Under *destination principle*, the country-wise VAT collection would be: Taka 690 million in Country A [= Taka 4,600 × 15 percent], Taka 705 million in Country B [= Taka 4,700 × 15 percent], Taka 465 million in Country C [= Taka 3,100 × 15 percent] and Taka 840 million in Country D [= Taka 5,600 × 15 percent]. And total VAT collected would be Taka 2,700 million [= Taka 690 million + Taka 705 million + Taka 465 million + Taka 840 million]. Thus, under both origin principle and destination principle, equal revenue of Taka 2,700 million would be collected and thereby the characteristic of equifinality is found in the VAT system. This illustration is represented in the following Table # 2.

Table # 2: Destination vs. Origin Principles and Equifinality in VAT System
(Figures in million Taka)

	Country A	Country B	Country C	Country D	World
Production	5,000	4,000	3,000	6,000	18,000
VAT @ 15%	<u>750</u>	<u>600</u>	<u>450</u>	<u>900</u>	<u>2,700</u>
Import from					
Country A		500	400	200	1,100
Country B	200		300		500
Country C		100		500	600
Country D	500	600			1,100
Export by					
Country A	(1,100)				(1,100)
Country B		(500)			(500)
Country C			(600)		(600)
Country D				(1,100)	(1,100)
Country's consumption	<u>4,600</u>	<u>4,700</u>	<u>3,100</u>	<u>5,600</u>	<u>18,000</u>
VAT @ 15%	<u>690</u>	<u>705</u>	<u>465</u>	<u>840</u>	<u>2,700</u>

Tax-Exclusive VAT Rate vs Tax-Inclusive VAT Rate

- The rate of any ad valorem tax (like VAT) can be stated in either its tax-exclusive or tax-inclusive form to yield the same revenue. The effective tax rate will be lower in the tax-exclusive form because this rate is applied to the price as swollen by the tax itself (Shoup, 1990: 12-13). If t_i represents the tax-inclusive rate and t_e represents the tax-exclusive rate, then t_i equals to $t_e/(1 + t_e)$ and t_e equals to $t_i/(1 - t_i)$. Thus, the tax-exclusive rate (t_e) of 15 percent shall be equal to the tax-inclusive rate (t_i) of 13.0435 percent [= 15per cent/(1+15per cent) = 0.15/1.15 = 0.130435]. The tax-exclusive rate (t_e) shall be applied on VAT-exclusive price to determine VAT at the concerned stage and the tax-inclusive rate (t_i) shall be applied on VAT-inclusive price to determine VAT at the concerned stage. Using this guideline, two different

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rates of VAT shall produce equal revenue output for the government and consequently, it can be said that the systemic characteristic of equifinality has its presence in the VAT system.

- For instance, we assume that the production and distribution system will follow the chain of import-supply-production-wholesale-retail-consumption stages. The importer imported some goods at Taka 5,000 (VAT-exclusive price), on which (s)he paid Taka 750 as VAT at VAT-exclusive rate of 15 percent. Then (s)he sold the imported goods to a producer at Taka 6,000 (VAT-exclusive price), on which he collected Taka 900 as VAT at VAT-exclusive rate of 15 percent. The importer has to pay to the Government Treasury Taka 150 as net VAT payable after deducting his/her VAT paid earlier at import stage. If the producer, after production, sold the produced goods to a wholesaler at Taka 10,000 (VAT-exclusive price), on which (s)he collected Taka 1,500 as VAT at VAT-exclusive rate of 15 percent, the producer has to pay to the Government Treasury Taka 600 as net VAT payable after deducting his/her VAT paid earlier at purchase from importer [Taka 900]. If the wholesaler sold the purchased goods to a retailer at Taka 11,000 (VAT-exclusive price), on which (s)he collected Taka 1,650 as VAT at VAT-exclusive rate of 15 percent, the wholesaler has to pay to the Government Treasury Taka 150 as net VAT payable after deducting his/her VAT paid earlier at purchase from producer [Taka 1,500]. If the retailer sold the purchased goods to a consumer at Taka 11,500 (VAT-exclusive price), on which (s)he collected Taka 1,725 as VAT at VAT-exclusive rate of 15 percent, the retailer has to pay to the Government Treasury Taka 75 as net VAT payable after deducting his/her VAT paid earlier at purchase from wholesaler [Taka 1,650]. Thus, total VAT deposited to the Government Treasury by using the tax-exclusive rate was Taka 1,725 [= Taka 900 by the importer + Taka 600 by the producer + Taka 150 by the wholesaler + Taka 75 by the retailer].
- At the time of applying the tax-inclusive rate of VAT, which is 13.0435 percent [=15%/(1+15%)], the rate is to be used on VAT-inclusive price. This price is the summation of VAT-exclusive price and VAT itself. To inform the buyers properly about the real price they have to pay, sometimes VAT-inclusive price may be more useful to avoid any confusion about the price of the product and the buyer's requirement for payment. Using the same example, we found that the importer's VAT-inclusive price of imported goods was Taka 5,750, on which (s)he paid Taka 750 as VAT at VAT-inclusive rate of 13.0435 percent. Then (s)he sold the imported goods to a producer at Taka 6,900 (VAT-inclusive price), on which (s)he collected Taka 900 as VAT at VAT-inclusive rate of 13.0435 percent. The importer has to pay to the Government Treasury Taka 150 as net VAT payable after deducting his/her VAT paid earlier at import stage and totally importer has deposited Taka 900 [= Taka 750 + Taka 150]. The producer's sale price inclusive of VAT to the wholesaler was Taka 11,500 (VAT-inclusive price), on which (s)he collected Taka 1,500 as VAT at VAT-exclusive rate of 13.0435 percent. The producer has to pay to the Government Treasury Taka 600 as net VAT payable after deducting his/her VAT paid earlier at purchase from importer [Taka 900]. The wholesaler's sale price inclusive of VAT to the retailer was Taka 12,650

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(VAT-inclusive price), on which (s)he collected Taka 1,650 as VAT at VAT-inclusive rate of 13.0435 percent. The wholesaler has to pay to the Government Treasury Taka 150 as net VAT payable after deducting his/her VAT paid earlier at purchase from producer [Taka 1,500]. The retailer's sale price inclusive of VAT to the consumer was Taka 13,225 (VAT-inclusive price), on which (s)he collected Taka 1,725 as VAT at VAT-inclusive rate of 13.0435 percent. The retailer has to pay to the Government Treasury Taka 75 as net VAT payable after deducting his/her VAT paid earlier at purchase from wholesaler [Taka 1,650]. Thus, total VAT deposited to the Government Treasury by using the tax-inclusive rate was Taka 1,725 [= Taka 900 by the importer + Taka 600 by the producer + Taka 150 by the wholesaler + Taka 75 by the retailer]. And this VAT revenue is equal to the VAT deposited to the Government Treasury by using the VAT-exclusive rate of 15 percent which is illustrated in the following Table #3.

Table # 3: Tax-Exclusive vs. Tax-Inclusive Rates of VAT and Equifinality in VAT System

VAT-payers	VAT @ Tax-Exclusive Rate				VAT @ Tax-Inclusive Rate		
	VAT-exclusive Selling Price (Taka)	VAT @ tax-exclusive rate 15%	VAT-inclusive Selling Price (Taka)	VAT payable (Taka)	VAT-inclusive Selling Price (Taka)	VAT @ tax-inclusive rate 13.0435%	VAT payable (Taka)
(1)	(2)	(3)=(2)×15%	(4)=(2)+(3)	(5)	(6)=(3)	(7)=(6)×13.0435%	(8)
Importer-Import	5,000 ^a	750	5,750 ^a	750 ^c	5,750 ^a	750	750 ^c
Importer-Supplier	6,000	900	6,900	150 ^d	6,900	900	150 ^d
Producer	10,000	1,500	11,500	600 ^d	11,500	1,500	600 ^d
Wholesaler	11,000	1,650	12,650	150 ^d	12,650	1,650	150 ^d
Retailer	11,500	1,725	13,225 ^b	75 ^d	13,225 ^b	1,725	75 ^d
Consumer	13,225 ^b			1,725			1,725

^a Imported price

^b Purchase price

^c VAT paid at import-stage

^d Output-VAT at any stage *minus* VAT paid at preceding stage

Conclusion

- Equifinality has been a systemic tendency found in any man-made, conceptual, dynamic, open system. It refers to equal final output of a system with different initial inputs. It has been tested above that in the VAT system, there lies this systemic tendency of equifinality. In different guises equifinality exists in the VAT system, which remains unseen with the naked eye. It is proved that with additive or deductive methods of VAT calculation, equal final amount of VAT is obtained. Again, with origin principle or destination principle, the amount of VAT generated under some circumstances is equal. Moreover, applying tax-inclusive or tax-exclusive rate of VAT, we get the

same amount of VAT output. Since systemic feature of equifinality is found to be there in the VAT system; so the VAT system can be studied with a systemic point of view to find out problems with the system – elimination of those problems can make the system a better functioning revenue generating machine. A country adopts VAT either with destination principle, tax-inclusive and subtractive method or with origin principle, tax-exclusive and additive method or amalgamation of any of these three. It can be examined how those different types of calculations accommodate other social objectives of the government and how best the revenue objectives of the government can be achieved with an amalgamation of these different methods. The indication amply justifies the efforts for further development of the VAT system.

References

- GOB (Government of Bangladesh) (1991) *The Finance Act, 1991* (Dhaka: Bangladesh Government Press; The Bangladesh Gazette, Extraordinary).
- GOB (Government of Bangladesh) (1992) *The Finance Act, 1992* (Dhaka: Bangladesh Government Press; The Bangladesh Gazette, Extraordinary).
- GOB (Government of Bangladesh) (1994) *The Finance Act, 1994* (Dhaka: Bangladesh Government Press; The Bangladesh Gazette, Extraordinary).
- Heeden, Koenraad van der, J. Brondolo and A. Firestone (1994) *Bangladesh: Toward Improving Income and Value-Added Tax Administration* (Washington, D.C.: The International Monetary Fund).
- Shoup, Carl S. (1990), “Summary,” in Malcon Gillis, Carl S. Shoup and Gerardo P. Sicat (eds.) (1990) *Value Added Taxation in Developing Countries* (Washington, D.C.: The World Bank).
- Tait, A. A. (1988) *Value Added Tax* (Washington, D.C.: The International Monetary Fund).