The implementation of measures to increase the revenue side of the state budget, taking into account both external and internal factors affecting its formation, in turn, will help improve the macroeconomic indicators of the country's development.

Given the potential for analyzing the cumulative impact of these factors on government revenues, it is advisable to consider the formation of the revenue side of the budget of Ukraine in terms of tax revenues in the context of a pandemic in order to formulate unified recommendations for increasing it.

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MODELING PRICE, SUPPLY AND DEMAND BY USING SYSTEM DYNAMICS

Supply and demand, in economics, relationship between the quantity of a commodity that producers wish to sell at various prices and the quantity that consumers wish to buy. It is the main model of price determination used in economic theory. With demand indicated by a downward sloping demand curve and supply represented by an upward sloping supply curve, then equilibrium in this market is where demand equals supply.

In the model Price depends on: price change, price change rate and indicated price. The *price change rate* is supposed to be a measure of how quickly demand and

supply gabs are closed. The higher the value, the faster Price changes towards its equilibrium value. Also,

$$price\ change = price\ change\ rate*(indicated\ price - Price)$$

$$indicated\ price = Price*(demand:\ supply\ ratio)$$

$$demand:\ supply\ ratio = \frac{quantity\ demand}{quantity\ supplied}$$

When Price changes, the impact on quantity demanded and supplied depends on their coefficients. The larger the coefficient, the greater the impact is. Other factors outside of the model (exogenous) also influence demand and supply; for example, changes in consumer income or changes in producer costs would influence demand and supply, respectively.

For most goods and services the price change does not cause an immediate change in sales. It takes time for consumers to notice the price change and adjust quantity demanded. Also, producers responding to a market price change will take some time to decide how to respond.

From the above it follows that:

$$quantity\ demanded = exogenous\ demand + demand\ coefficient * DELAY3(Price;\ demand\ adj\ delay\ for\ costumers)$$

where $demand\ adj\ delay\ for\ costumers = 1$ [month]

$$quantity\ supply = exogenous\ supply + supply\ coefficient * DELAY3(Price;\ supply\ adj\ delay\ for\ products)$$

where $supply\ adj\ delay\ for\ products = 1$ [month]

Important to note that:

$$quantity\ traded = MIN(quantity\ demanded;\ quantity\ supply)$$

It has been necessary to highlight the quantity traded, because in the dynamics of demand and supply we are considering adjustment towards the equilibrium and while this is taking place the market is out of equilibrium, and we must establish at any particular price what quantity is traded.

Figure 1. Price, supply and demand model

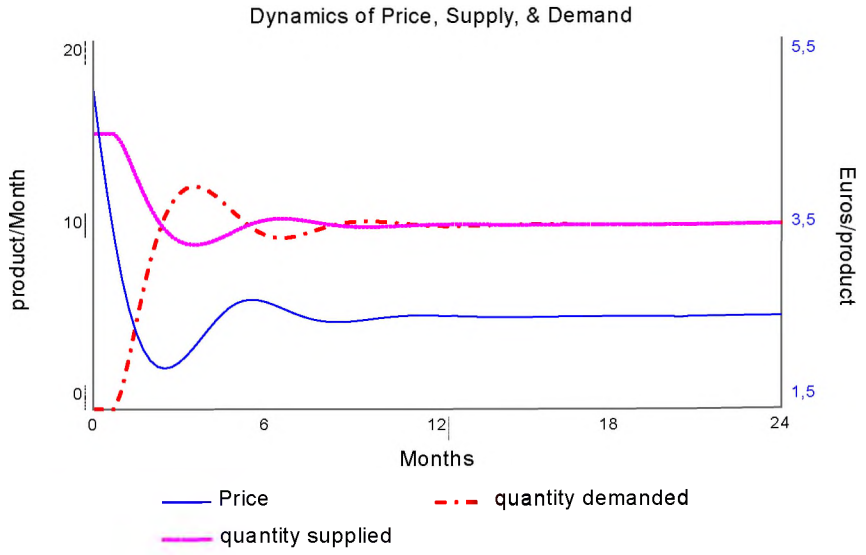

Figure 2. Behavior of the price supply and demand

The graph shows that the change of price causes the difference between the quantity demanded and the quantity supplied, but after some time pass price become equilibrium. Also, quantity demanded and quantity supplied become equilibrium and equal.

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