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HOW THE EXCISE TAX INFLUENCES THE SMOKING PREVALENCE IN UKRAINE

During last years the humanity started to care more about ecology, environment, human's health, and other issues concerning the whole world and every human, but there are still such things that are considered as the global problems and from which humanity is unable to get rid yet. For example – smoking. This habit harms not only those who have it but also surrounding people, that is why the idea of reducing the smoking prevalence became the main cause of creating this model.

The model given reveals and explains the dynamic of smoking prevalence in Ukraine from 2008 to 2020 and aims to study further development of the issues till 2025. As the reference mode of smoking prevalence, it has been taken a historical data of actual number of smokers and their share in the population (Figure 1). An overall population of Ukraine decreases year by year and, consequently, the number of smokers does the same. Nevertheless, their share in population stays almost on the same level and didn't change already for 7 years. Thus, in fact, people haven't started to smoke less.
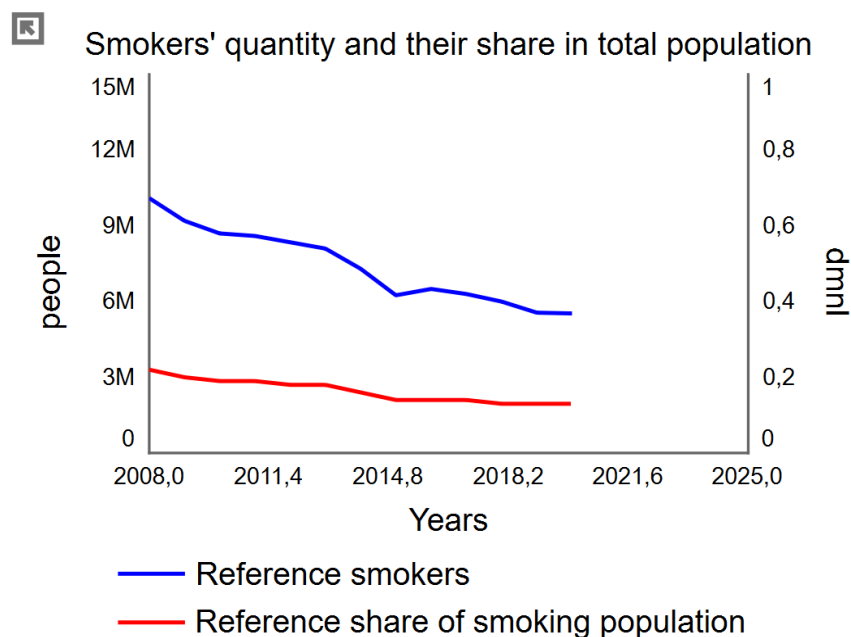
Figure 1. The reference mode: Smokers and Share of smoking population

The first hypothesis on which the model is based is the following: growing number of smokers leads to its further growth – when the percentage of smokers rises, the probability for non-smokers to start smoke and probability to relapse for past smokers get higher, while the probability for smokers to get rid of this habit becomes lower.
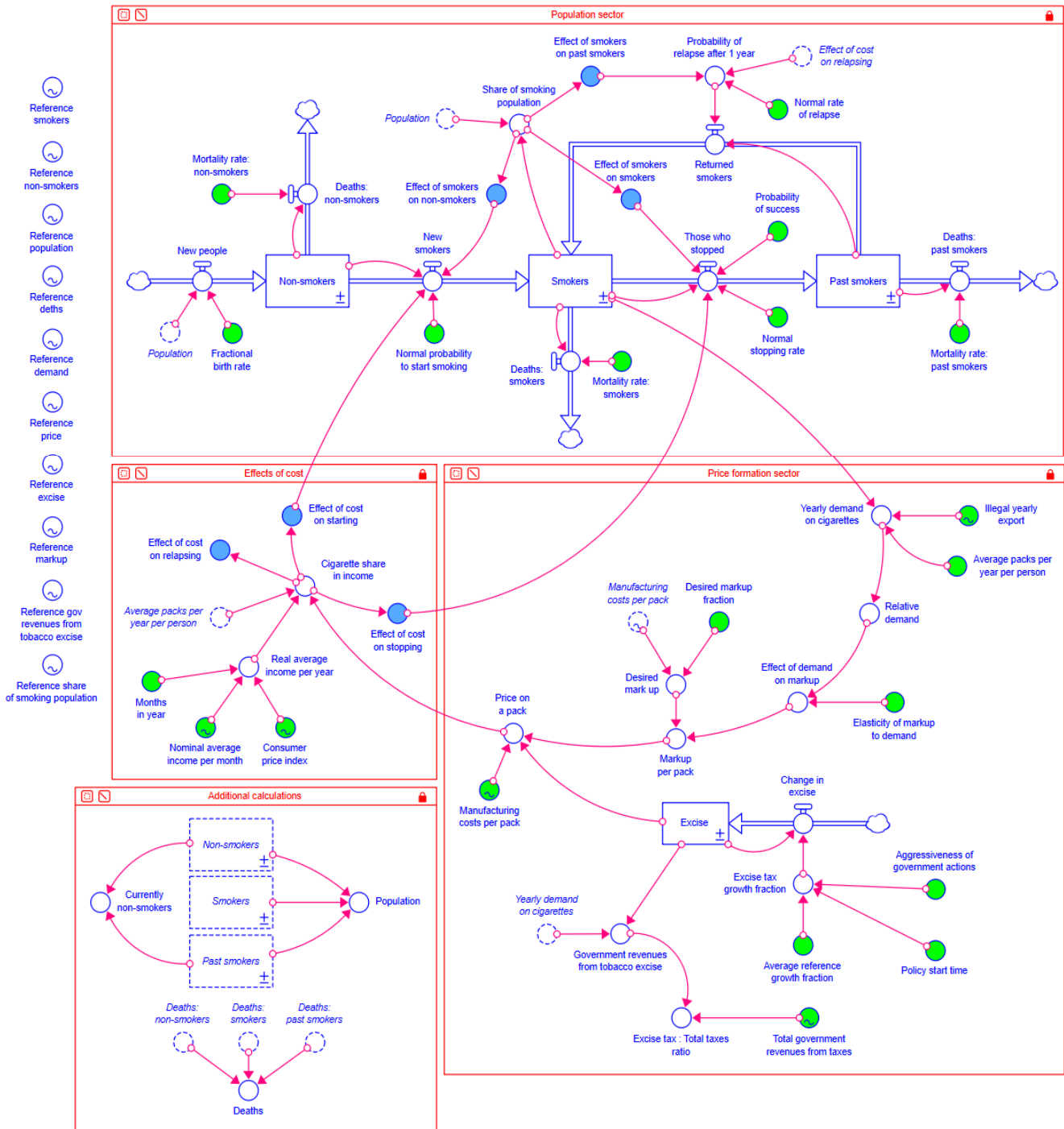

Figure 2. The model's structure

Second hypothesis: if the number of smokers increases, the demand on cigarettes grows and markup rises. Besides this, government increases the excise tax with intention to reduce the smoking prevalence. Thus, the price on cigarettes rises and effects of cost become stronger (the probability to start smoking for non-smokers and the probability to relapse for past smokers decrease, while the probability of smokers to quit increases).

On the Figure 2 it can be seen the model's overall structure that consists of 3 blocks: population sector (represents all processes in terms of humans quantity), price formation sector (represents the formation of the price on cigarettes) and effects of costs sector (represents how price influences on 3 groups of people).

After completion the basic model's goal (representing the reference mode and making sure that the model behaves exactly in the way it should behave) an appropriate policy was ready to be tested.

The main goal of this policy was to reduce the number of smokers. Aggressiveness of government actions became the main leverage point in the system for policy intervention. Increasing of aggressiveness with which the government increases the excise tax stimulates rapid growth of price on cigarettes. Because of this, a power of the effects of cost on people becomes stronger. It leads to faster decrease in number of smokers that, at some point of time, reduces further rates of starting, relapsing and raises the rate of stopping, so the share of smokers falls. On the Figure 3 there are shown two scenarios – the first one (blue line) implies no changes in government's aggressiveness and the second one (red line) implies its rising from 1 to 1,5:
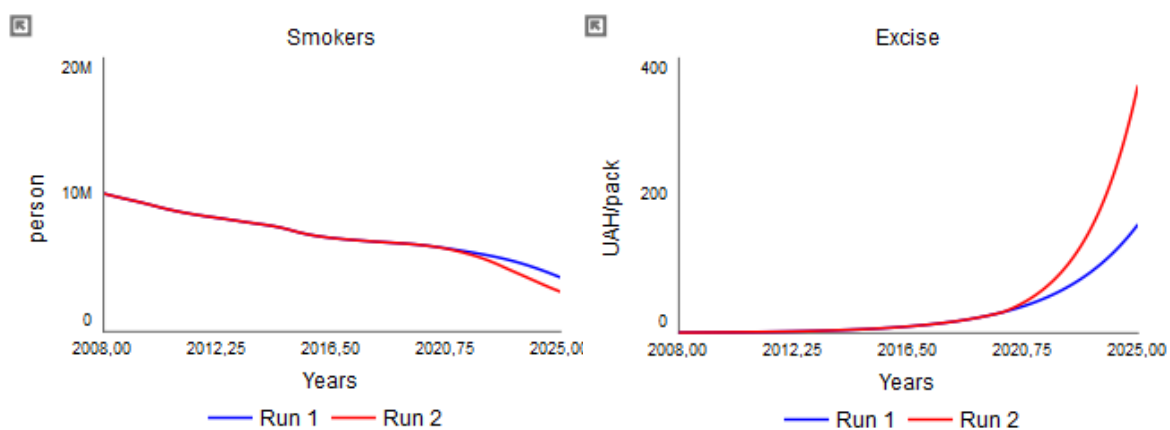
Figure 3. The behavior of main variables without (Run 1) and with policy (Run 2)

In short, increasing aggressiveness of government actions almost immediately strengthens effects of cost and accelerates an appearance of positive effects, caused by an insignificant share of smokers, which together faster and faster decline the number of smokers.

If the aggressiveness is equal to 1 than excise tax growth fraction is equal to average historical growth fraction, that is 33%. It means that the government leaves the growth rate the same as it was earlier. In this case in 2025 excise will be equal to 150 hryvnias per pack and there will be 4,14 million smokers in Ukraine.

If the aggressiveness will be equal to 1,5 than excise tax growth fraction will be equal to average historical growth fraction multiplied by the government aggressiveness and excise growth rate will increase from 33% to 49,5%. In this case in 2025 excise will be equal to 333 hryvnias per pack (on 183 hryvnias more) and in our country there will be 3,05 million smokers (on 1,09 million less).

So, the model has such structure that includes a row of the most significant cause and effect relationships, which influence on and determine the people's behavior regarding starting, quitting and keeping smoking. Also it include an important and detailed process of price formation on cigarettes in Ukraine and also states what exactly has an impact on it. The policy implemented gives an opportunity to reach the main goal – decrease smokers share in the total population.

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