If we analyze the reports of these three indices in recent years, we can see that the leaders in each of them are different. For example, according to the World Happiness Report, Finland has been a leader for the last two years, according to the Human Development Index, Norway has taken the first the first place in 2018, and according to the World Happiness Index, which was last calculated in 2016, Costa Rica became the leader.

However, it is important to note that both Scandinavian countries, Finland and Norway have been among the top five in the Human Development Index and in the World Happiness Report for more than 5 years, just occasionally changing places. This is explained quite simply, because they are similar in economic and social system organization.

As for HPI rate, Costa Rica is the leader, because of its impressive environmental footprint level, and the country has a very insignificant difference with Finland`s and Norway's longevity level. However, an important factor was the subjective assessment of happiness by the population itself, due to the warm climate in the country and the location of the country among the Caribbean Sea and Pacific Ocean.

So, by analyzing the components and examining the results over the last couple of years on all three indices, we can conclude that countries governments around the world need to pay attention not only to economic indicators, but also to social, cultural and environmental ones. Because for the sake of maximum happiness and well-being of the population it is important to develop all factors, in particular, to pay special attention to the social policy of the country.

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## SPECIFICS OF THE USE OF PROBIT AND LOGIT REGRESSION MODELS IN CLINICAL STUDIES: CASE STUDY COMPARATIVE ANALYSIS


***Ganzha Roman,***
Postgraduate Student,
Assistant at Statistics and Demography department,
Taras Shevchenko National University of Kyiv


Logit and probit models are members of a generalized linear models family that is widely used to estimate the functional relationship between binary response variables and predicators [1]. Comparison of the regression models for binary response variables could be complicated due to the choice of the link function [4]. The focus of the paper is to make a comparative description of the two models that were used in prediction of the type of surgical intervention in women diagnosed with breast cancer – the breast-conserving surgery and mastectomy [2]. The study included 73 patients with breast cancer who underwent a mammographic examination and surgery planned according to this examination. Along with prediction goal, the study included additional objective to determine factors that are in charge of the outcome of interest [2].

The paper provided theoretical methods of derivation of the models. Binomial regression models were fitted to the data collected during mammographic screening with a set of factors identified as the ones that are potentially affecting the choice of type of the surgical intervention. The set of factors was formed out of the regular mammographic measurements such as form of the tumour, structure, localization, presence of edema, or infiltrative growth, etc. After applying logit and probit link functions, logit and probit regression models were obtained. The models consisted from 3 key factors that were found as the ones that non-randomly affecting the choice of the type of surgical intervention according to significance-based variable selection. These factors were stage of disease, presence of the "path" to the nipple and lesion coefficient [2]. The Chi-Square values for both the logit and probit models were in excess of pre-defined level 0f 0.05 indicating that the models performed well and can be further used in predication of more favourable type of surgical intervention. This was also supported by the AIC values [3]. The receiver operating characteristic curve showed that two models were quite similar though the probit model had a slightly better performance yielding lightly better prediction than the logit model. Due to simplicity of the interpretation of the result for both logit and probit models, the focus was maintained rather on interpretation of the results [1].

According to probit regression, the results showed that for breast-conserving type of surgery, the presence of the "path" to the nipple was the most important when comparing second stages of disease of type A and B with the p-value being equal to 0.0078. However, during comparing the third stage of disease of type A and second stage of type B, the presence of the "path" to the nipple appeared to no longer be statistically significant with a p-value equal to 0.3525. Additionally, the absence of the "path" was found somewhat borderline in terms of comparing the same second stages of disease A and B with a p-value equal to 0.0585. The absence of the "path" to the nipple appeared to be statistically insignificant when comparing third stage of disease of type A and second stage of type B.

Logit model revealed that differences in odds ratios in pairwise comparisons of disease stages were statistically significant, especially when comparing second disease stages of type A and B, as well as when comparing third stage of type A and second disease stage of type B. In both cases, the model reflected greater chances for further undergoing the mastectomy type of surgery rather than breast-conserving surgery with p-values equal to 0.0448 and 0.0235 respectively. These results were interpreted as with an increase of the stage of the disease, the odds for further undergoing the mastectomy rather than breast-conserving surgery increase.

To conclude, the study showed that two models – logit and probit produce very similar results. However, the estimates of the parameters of the two models are not directly comparable [1, 4]. The advantage of the logit model is the simplicity of its structure form and natural interpretability of the results while probit model allows one to obtained standardized estimates on a regular scale rather than logarithmic values [1]. The choice of whether to use probit or logit models heavily depends on the choice of the link function and therefore depends on the data collected and processed [4]. This leads to the choice being subjective rather than objective and often based on physical knowledge of the data.

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## A STATISTICAL ANALYSIS OF DIGITAL ECONOMY AND CORRUPTION


***Horna Maryna,***
Ph. D. in Economics,
assistant professor at the Department of Statistics;
***Ishchuk Yaroslava,***
Ph. D. in Economics,
assistant professor at the Department of Statistics;
SHEE “Kyiv National Economic University named after Vadym Hetman”


The purpose of the research was is to identify prospective areas for counteracting the corruption under conditions of the digital economy development. The possibility of using new digital technologies to combat the corruption in the context of the overall fight against corruption in the country is justified.

This study reports on the results of statistical analysis in which the relationship between the dependent variable of corruption, as measured by the Transparency International, and the independent variable of development of the Digital Economy, as measured by the European Comission: Digital Single Market. So, the research focuses on studying the prospects of using advanced technologies to eliminate the corruption [1-5].