

## **Sustainability Versus the Level of Development of Cities with County Rights in Poland in Terms of The Four-Capital Model\***

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\* Presented at the 43<sup>th</sup> IBIMA International Conference, 26-27 June 2024, Madrid, Spain.

### **Abstract**

The study aims to assess the sustainability and level of development of cities with county rights in 2013-2022 and establish the relationship between these categories. The four-capital model (4C) is used to achieve the goal, according to which the sustainability of development is maintained if capital resources (economic, human, natural and social) are at a constant level or increase over time. The analysis shows that cities with county rights were characterized by sustainable growth, averaging 6.9% (with economic capital increasing by 9.4%, human by 3.1%, natural by 5.6%, and social by 9.4%). The Spearman correlation index of 0.81 ( $p < 0.05$ ) indicates that economic capital had the most significant impact on the final dynamics of urban development. The level of development of cities with county rights was determined using an aggregate measure calculated as the average value of standardized indicators (so-called Perkal index). From the research criteria point of view, the highest level of development was in Sopot (Perkal index = 3.0) and the lowest in Ruda Śląska (-1.0). The correlation analysis shows that the most significant impact on the final result had two capitals, i.e. economic and human, whose relationship with the aggregate measure amounted to 0.93 ( $p < 0.05$ ). The study showed that except for natural capital, for which it was impossible to establish a statistically significant correlation between sustainability and the level of development, in the remaining capitals, the direction was inversely proportional, and the intensity was moderate. The correlation coefficients were -0.33 for economic capital, -0.50 for human capital, and -0.51 for social capital. The relationship at the aggregate level (for the entire 4C model) was -0.52, which means that as the development level increases, the growth rate decreases and vice versa.

**Keywords:** sustainability, cities with county rights, Perkal index, the four-capital model