Meeting of the Group of Experts on Business Registers

Online 16-18 October 2024

Session 5: Producing statistics based on the SBR

First results for regional business demography statistics

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Abstract

So far, data for business demography has only been available for Germany in total and the other European countries. However, birth and death activity varies greatly in the individual regions of Germany and Europe. In the following abstract, the results of business demography are analysed by district and also in the distinction between urban, rural and intermediate (suburbs, small-town areas) regions.

When comparing the birth and death rates of the overall economy across the federal states, the city states in particular stand out with high rates. This applies to both birth and death rates, meaning that the business landscape there is more dynamic.

The regional breakdown of the results also enables further and comprehensive analyses of business demography. For a cartographic representation, the number of enterprise births is standardized with the number of active enterprises per district. Standardization is used when the presentation of absolute values would be distorted by the different area sizes of the regional units.

First results for regional business demography statistics

Data on business demography has been available only on an aggregate level for entire countries so far. Yet, one expects the dynamics of the birth and death of enterprises to vary considerably across different regions within a country. In this paper we present regional findings for federal states (Bundesländer) and districts (Kreise/kreisfreie Städte) in Germany, taking account of the context of urban, intermediate (suburban, small town) and rural areas. A first hint at different dynamics is given by comparing the birth and death rates across the German federal states. Both, birth and death rates, are significantly higher in the three city states Berlin, Bremen and Hamburg than in the remaining 13 area states, even when standardised by the number of active enterprises (see Figure 1). Since the area states subsume urban, intermediate and rural areas, a further regional breakdown is desirable.

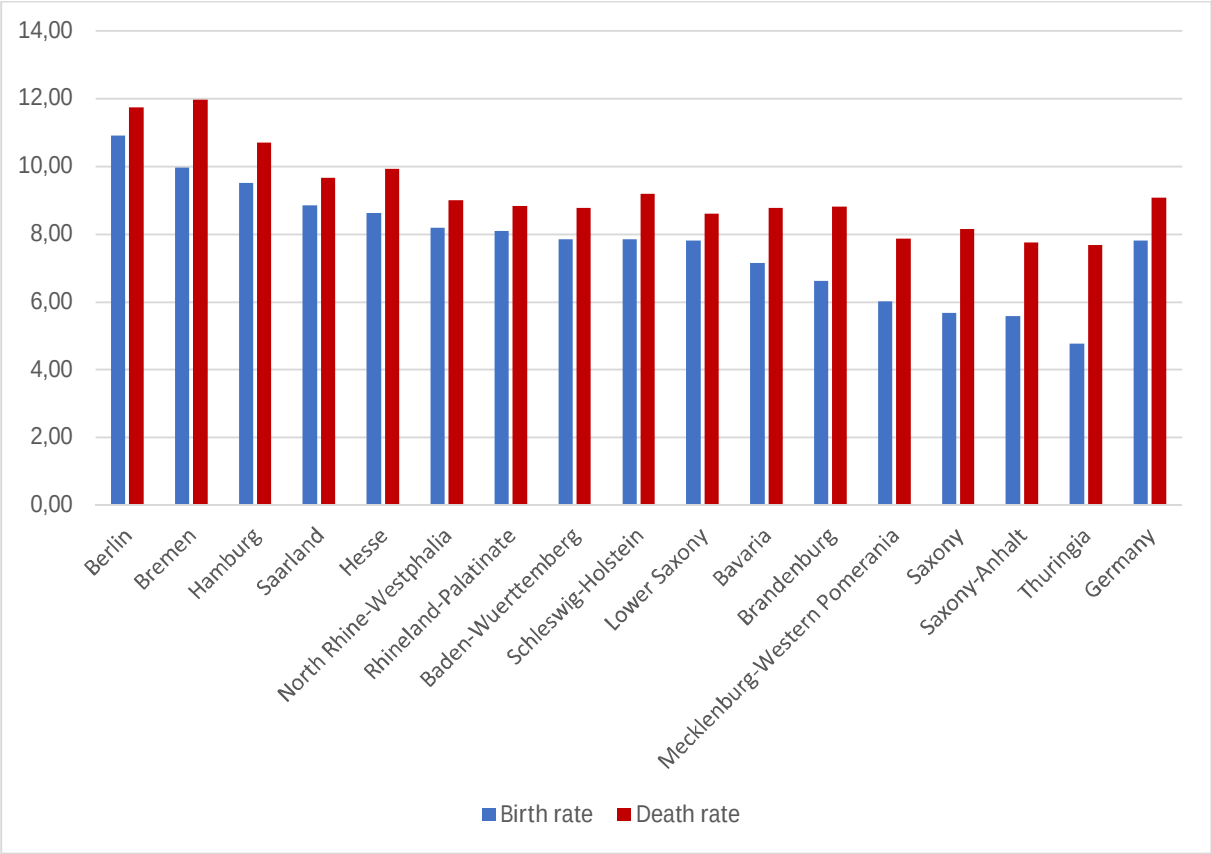

Fig. 1 Birth and death rates in Germany by federal state for reference year 2021, shown as births and deaths per 100 active enterprises

Absolute numbers of births and deaths depend on the size and structure of the administrative units. Therefore, we standardise the births and deaths of enterprises by the number of active enterprises, leaving us with the birth and death rates. Observations are then sorted from low to high rates and divided into six equally sized classes. The lowest class contains one sixths of the administrative units with the lowest rates, the highest class one sixths of the administrative units with the highest rates. Figure 2 visualizes the birth rates for the German districts in 2021.

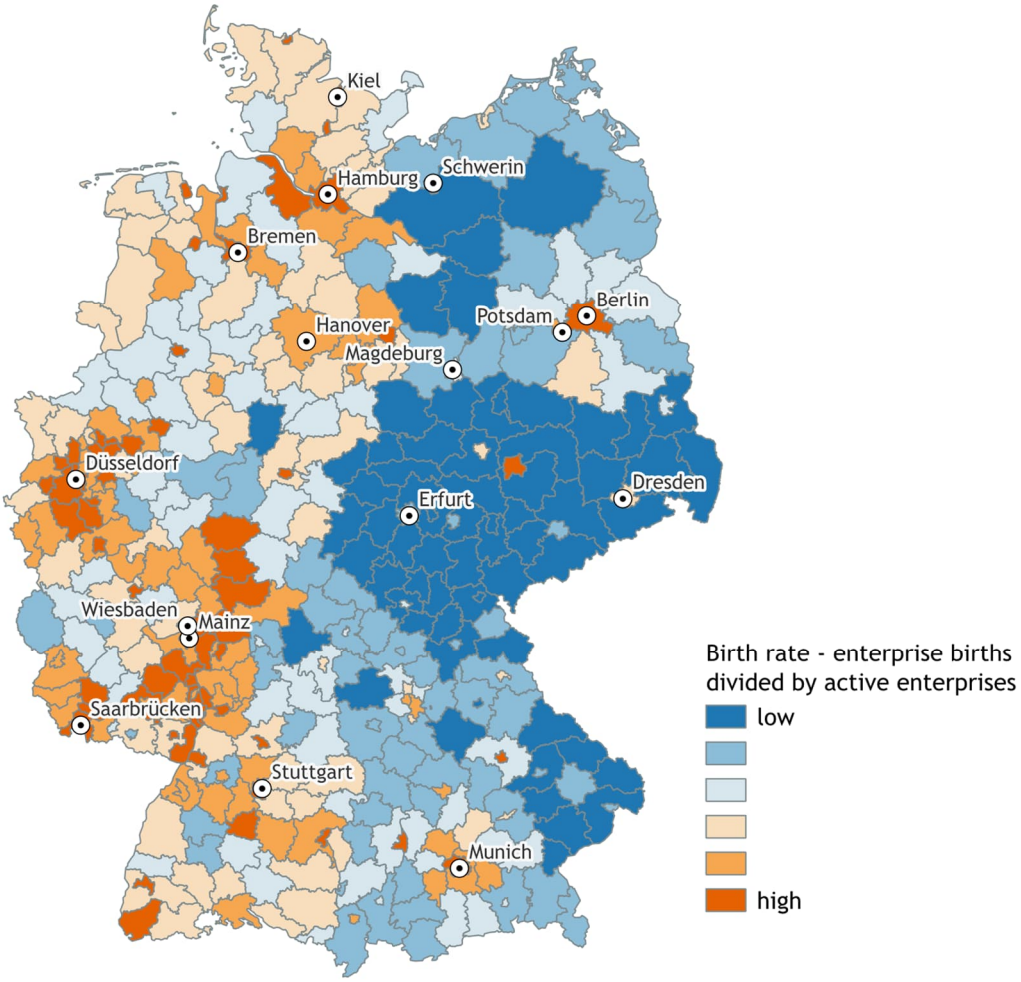

Fig. 2: Birth rates in Germany by district for reference year 2021, shown as births divided by active enterprises

From the perspective of economic geography, the calculation of birth and death rates by standardising with the number of active enterprises is arguable. Other things being equal, the same number of enterprises born would be considered low in an economically strong region with many active enterprises and high in an economically weak region with few active enterprises. Although the number of active enterprises is an indicator of the economic strength of a region, which potentially is also the outcome of past innovativeness, it is not necessarily an indicator of present innovation potential or the willingness to take economic risks among the population.

We propose standardisation by the population at working-age (16 to 65 years) as an alternative indicator to present enterprise births in the context of potential founders.

First and foremost, there is visible difference between Eastern districts and Western districts. Eastern districts are among the districts with the lowest birth rates while Western districts are among the districts with highest birth rates. Second, large cities and areas of urban agglomeration show significantly higher birth rates that also emanate to surrounding areas. While this effect seems universal, it is almost completely absent in the Southern

Germany, where Munich and Stuttgart form rare exceptions. This outcome might in fact be an artefact of the administrative boundaries.

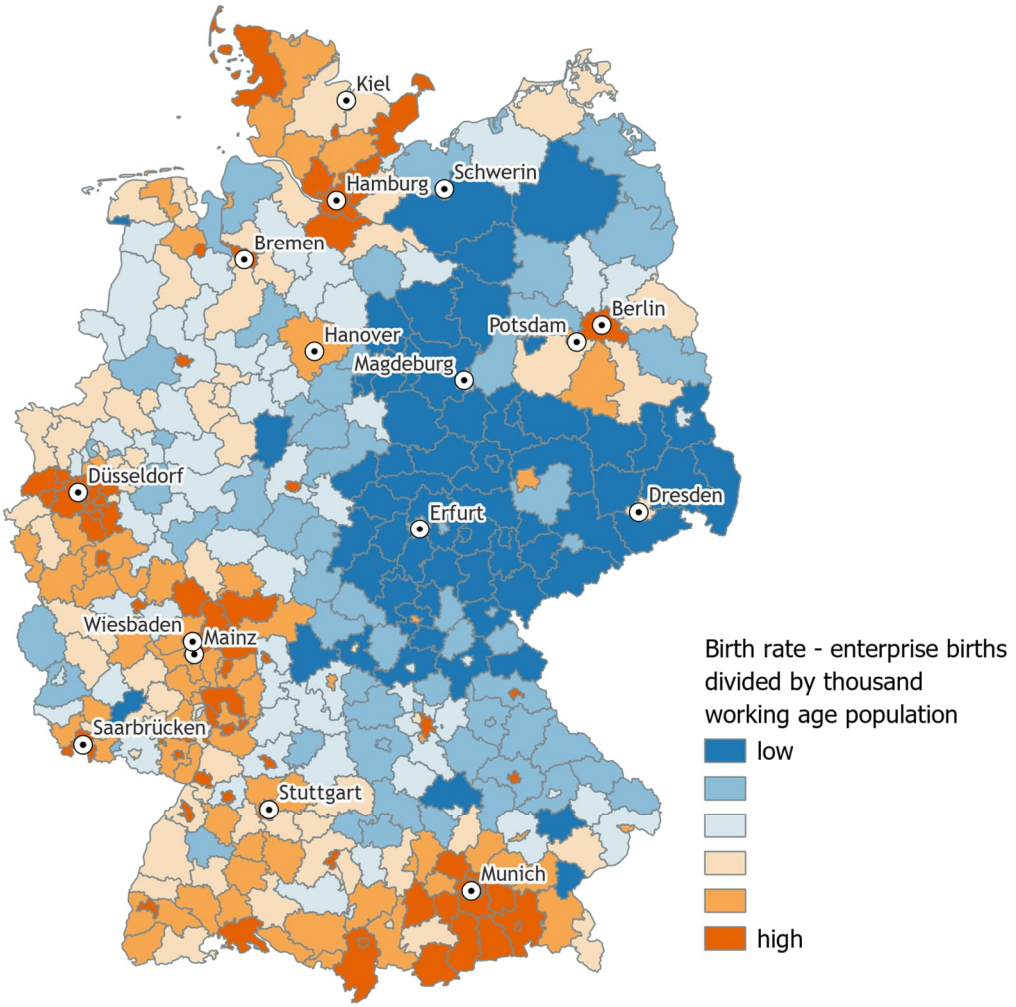

Fig. 3: Birth rates in Germany by district in the reference year 2021, shown as enterprise births per people of working age (15 to under 65 years)

Administrative boundaries differ across Germany. In Southern Germany, administrative boundaries often lead to a situation where cities and their surroundings form individual districts – so called kreisfreie Städte and Landkreise. In contrast, Northern Germany is characterized by districts that are formed jointly, by cities and their surroundings. Consequently, the differences in birth rates among urban and rural areas are to some extent blurred in the North, while they appear sharply in the South. It is the geometry of the administrative boundaries that critically impacts on the visualisation on a map, therefore we propose an alternative visualisation.

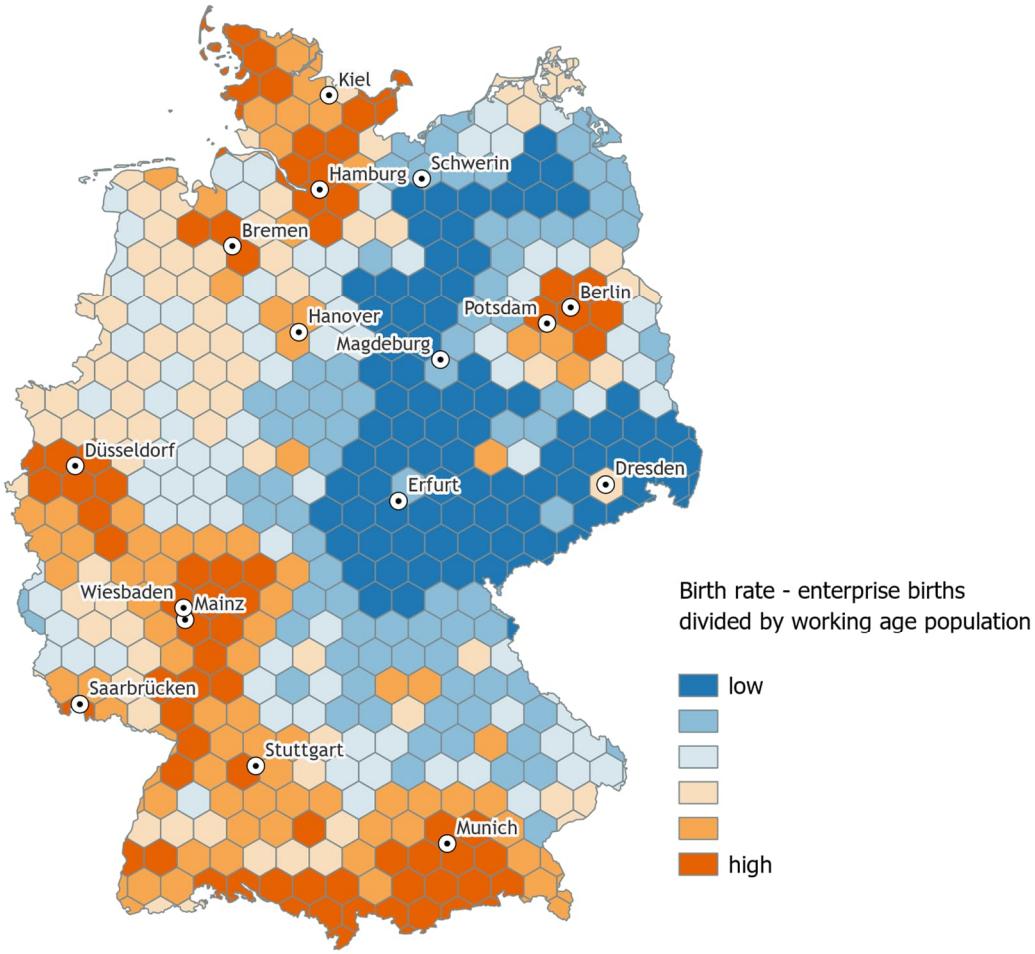

Fig. 4: Birth rates in Germany for reference year 2021in equal-area hexagons, shown as enterprise births per people of working age (15 to under 65 years)

Using the R package *cartography* with the method *getGridLayer*, we visualise the data with equal-sized hexagons – based on the median areal size of all districts – instead of heterogenous-sized administrative districts. As the underlying data on business births and working age population is based on administrative boundaries, however, the result is not a true representation of the birth rate in a hexagon but an interpolation of the birth rates from all the districts that fall into a hexagon. Nevertheless, birth rates between areas of South and Northern Germany become more comparable by this equalisation of shapes. Both, the impact of urban agglomeration and its emanation into more rural areas as well as the difference between Eastern districts and Western districts become more visible.

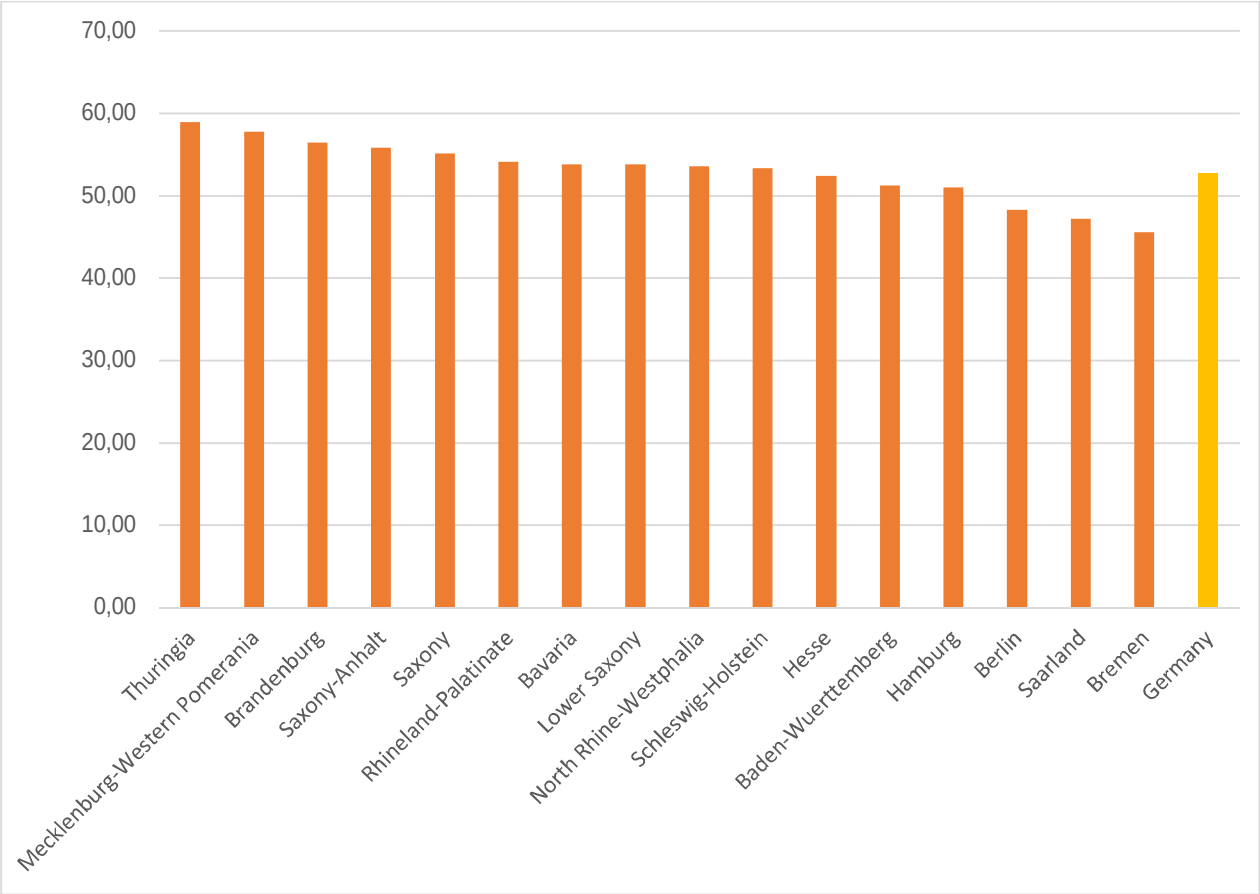

Fig. 5: Survival rates in Germany (Nace B-S) by federal state for reference year 2021

Taking survival rates of newly born enterprisesinto account, the birth of enterprises in the Eastern districts appears more durable than in its Western counterparts. For the cohort of enterprises founded in 2018, the number of surviving enterprises in 2021 (t+3) tends to be largest for the Eastern area states and lowest for the city states Hamburg, Berlin and Bremen, with the exception of Saarland. Additional to the geographical classification by federal states and districts, one can also obtain a structural classification of the areas by their urban or rural character.

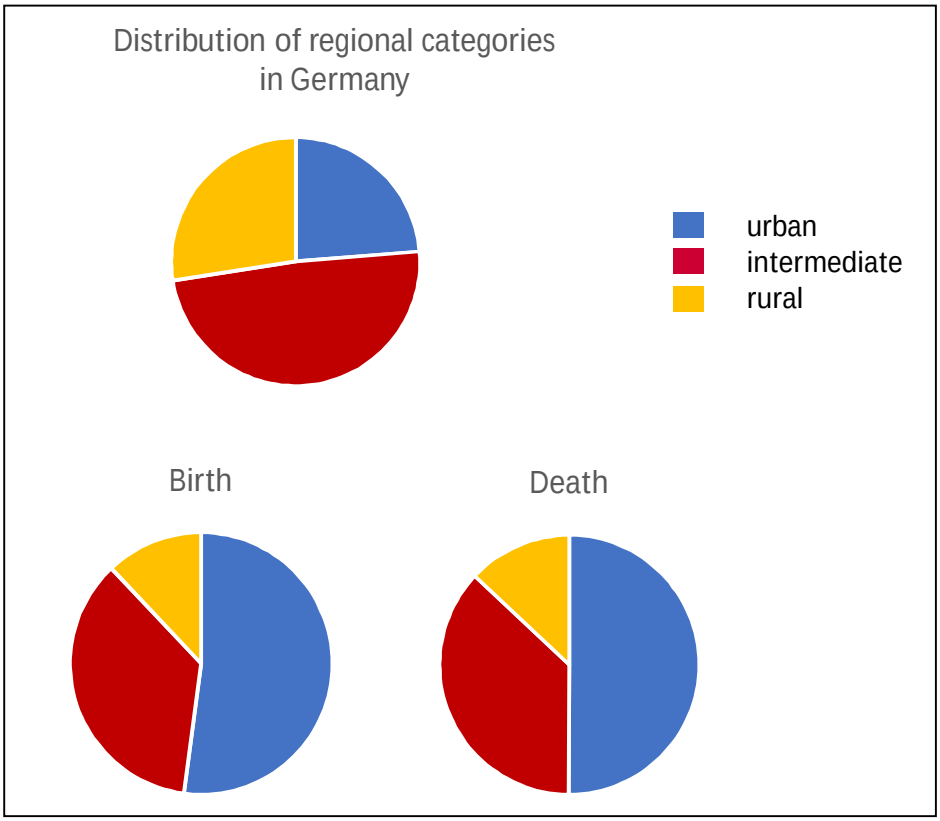

Fig. 6: Enterprise births and deaths in urban, intermediate and rural regions

When comparing economic dynamics across areas, urban, intermediate and rural areas differ significantly in their outcomes (Fig. 6). While roughly a quarter of the areas in Germany can be classified as urban, these areas account for about half the births and deaths of businesses. In contrast, rural areas account for more than a quarter of the areas, yet contribute only about one eighth of the births and deaths of enterprises. Intermediate areas, characterized by a mixture of urban and rural settings, represent almost half of the areas, yet make no more than 1/3 of the birth and deaths of enterprises.

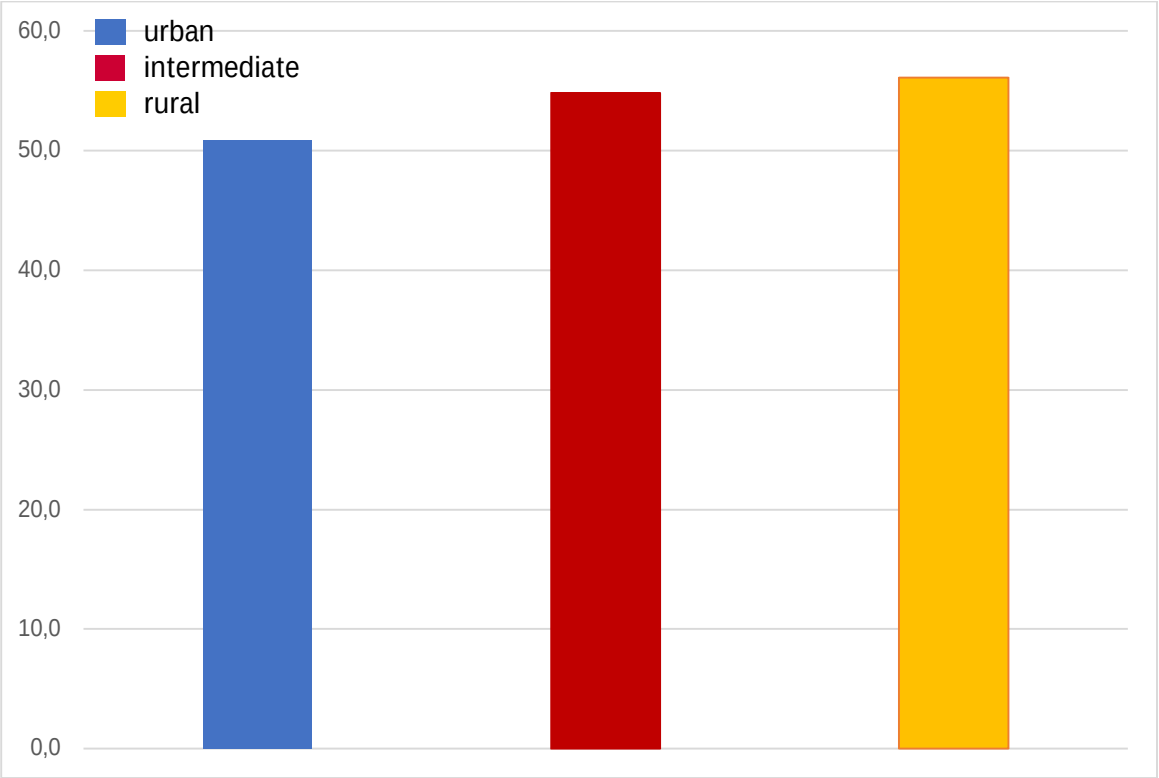

Fig. 7: Survival rates (companies founded 3 years ago) in Germany by rural category for reference year 2021

Looking at the durability of newly born enterprises, survival rates tend to be lowest in the urban areas and highest in the rural areas (see Figure 7). Despite the dynamism of enterprises birth in urban areas, these enterprises appear less durable than their counterparts in rural areas. Given the absolute numbers of births in urban areas, however, it is still the newly born enterprises in those urban areas that leave a mark, even if their durability is slightly lower.

Conclusion and Outlook

The map visualisation of data on business demography critically depends on the geometry of the observed administrative units, due to inherent differences in the structure of administrative units in Germany.

The statistical business register is a pilot of a broader national initiative (GeoStatProzess) that aims at the publication of georeferenced data on economic activity. In specific, it is intended to publish data on the basis of a 1 km grid. The small grid size as well as the equal-area-property, will allow for a true representation of the data. This will enable us to analyse business demography statistics based on case numbers without the (eventually) distorting effects of administrative boundaries, standardisation or interpolation of non-georeferenced values, allowing for new insights into the regional drivers of the birth and death of enterprises.

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