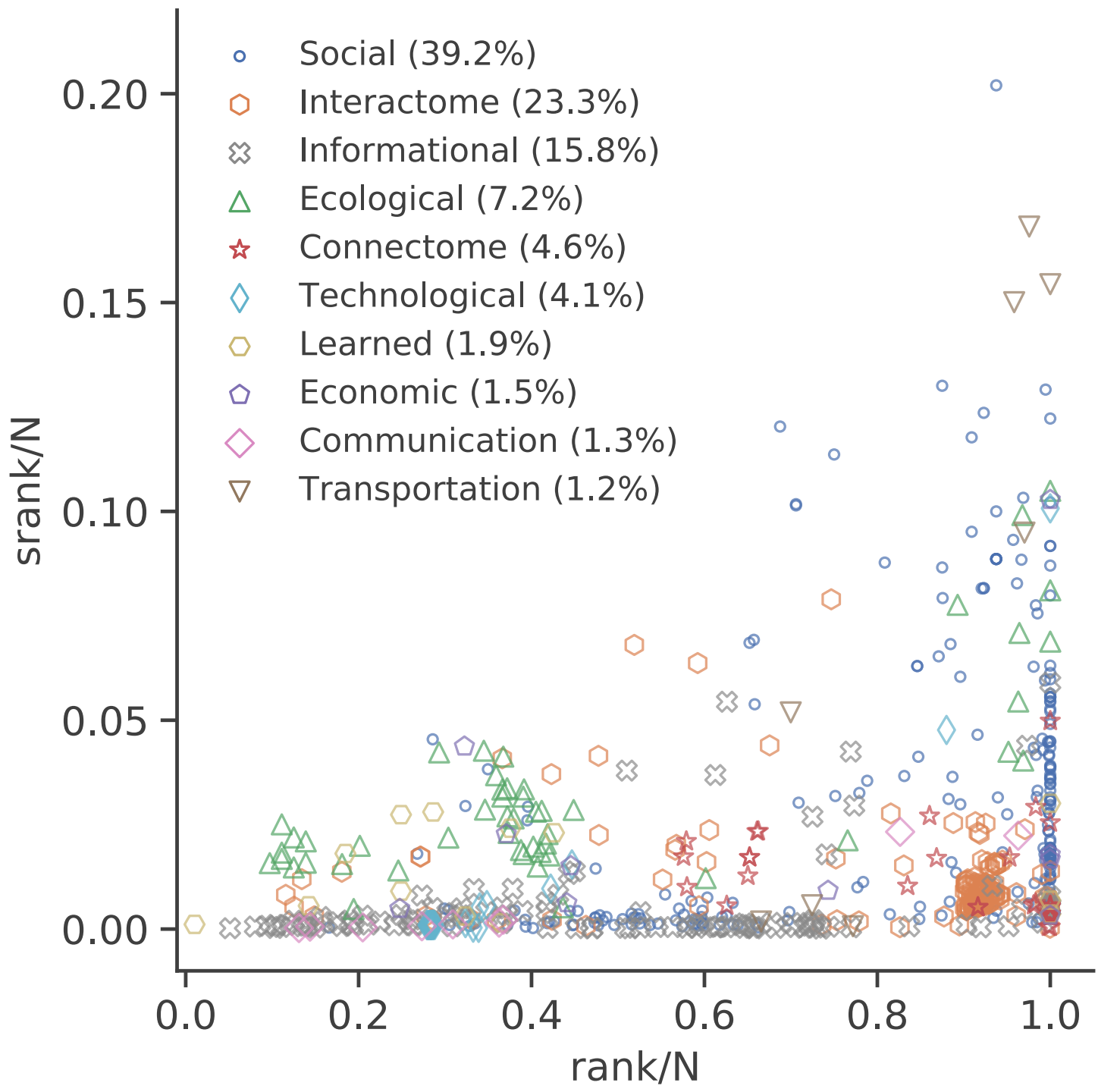




Results for 679 empirical networks (502 unweighted networks and 177 weighted networks) downloaded from Netzschleuder.

Many empirical networks appear to have low effective rank!



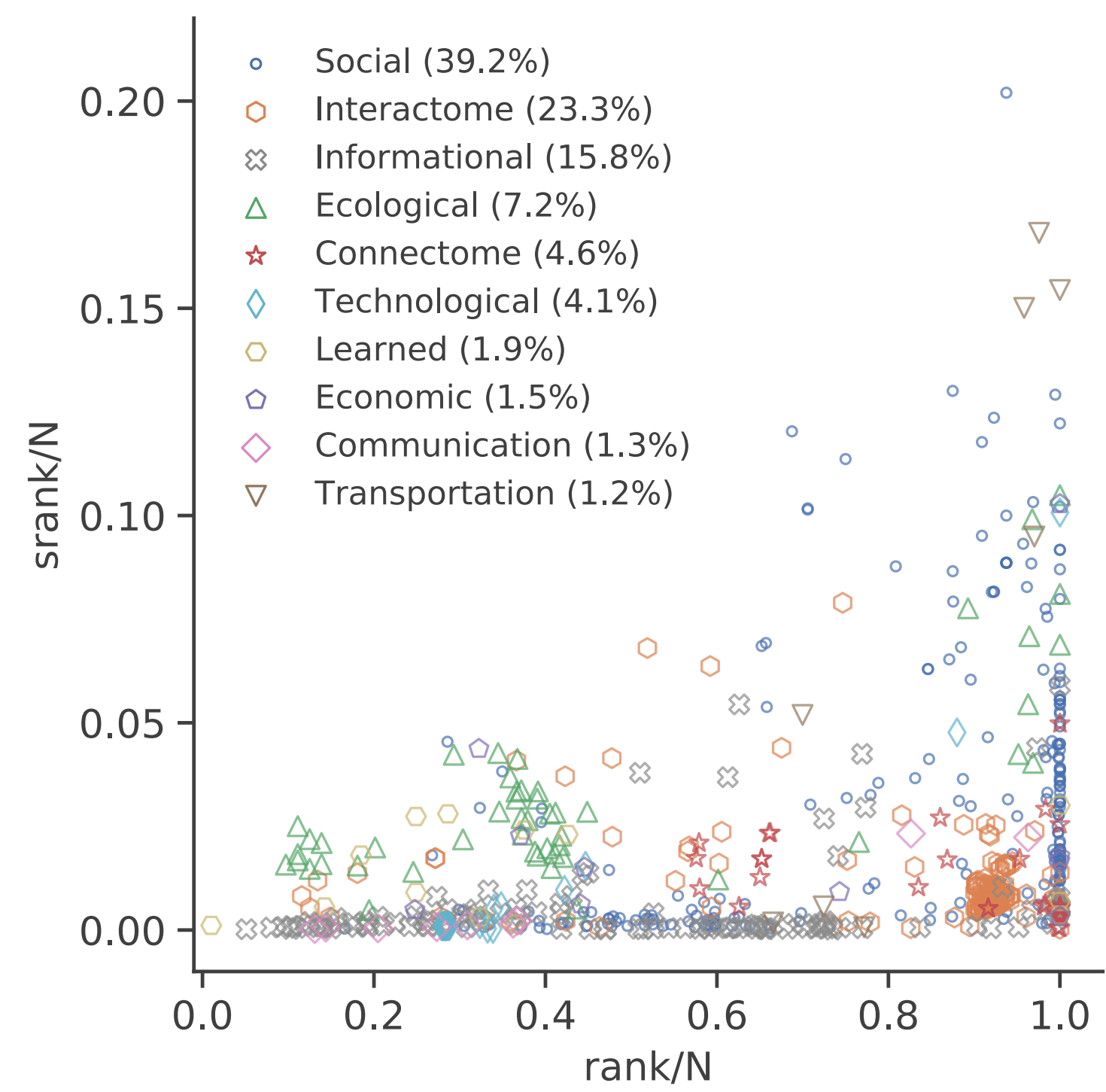
The effective ranks of adjacency matrices

But what does "low" mean?



# The effective ranks of adjacency matrices

Many empirical networks appear to have a low effective rank!



Results for 679 empirical networks (502 unweighted networks and 177 weighted networks) downloaded from Netzscheuler.

But what does “low” mean?



## A *workable* definition of “low” effective rank

Hint: the **rapid decrease** of the dominant singular values of the adjacency matrix implies a **low effective rank**

- ▷ low effective rank?  $\Rightarrow$  effective rank scales **at most sublinearly as the number of nodes**,  $N$ , goes to infinity ( $N^{1-\varepsilon}$  with  $\varepsilon \in (0, 1]$ )