Thanks again for the answer.

Indeed, when I try to run districts instead of clusters in the "svyset" framework, STATA is giving me missings for the F-statistics.

To sum up my issue: I have districts as groups and clusters as PSUs in my framework. I also understood from the literature that one should first of all cluster SE at the PSU-level, corresponding to the survey design.
But is it not an issue to cluster standard errors at another (lower) level than the groups that I use in my diff-in-diff?

May I finally ask, how you would proceed in this case? I read your abovementioned paper about the SMGL in Uganda and if I am not wrong you also compare changes in districts over time. So, I guess you clustered SEs at the PSU-level here and this is in general a valid approach to proceed (although groups are districts) ?

Thanks a lot for your time!
Till