SEMINÁRIO IBGE

ESPECIAL

STATE-SPACE MODELS FOR NOW CASTING SURVEY DATA

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RESUMO

THERE IS A GROWING INTEREST IN USING NON-TRADITIONAL DATA SOURCES OR BIG DATA SOURCES IN THE PRODUCTION FOR OFFICIAL STATISTICS AND THUS ALSO IN THE CONTEXT OF MEASURING SUSTAINABLE DEVELOPMENT GOAL (SDG) INDICATORS. ONE APPROACH IS TO USE THESE NEW DATA SOURCES AS A PRIMARY DATA SOURCE FOR STATISTICAL PURPOSES. ALTERNATIVELY THEY CAN BE COMBINED WITH SURVEY DATA IN MODEL-BASED ESTIMATION PROCEDURES, WHERE THEY SERVE AS COVARIATES. MARCHETTI ET AL. (2015) USED A MOBILITY INDICATOR DERIVED FROM GPS TRACKERS AS COVARIATES IN CROSS-SECTIONAL FAY-HERRIOT MODEL FOR SMALL AREA ESTIMATES FOR POVERTY. MOST SURVEYS CONDUCTED BY OFFICIAL STATISTICS ARE CONDUCTED REPEATEDLY. THEREFORE MULTIVARIATE TIME SERIES MODELS ARE VERY APPROPRIATE FOR SMALL AREA ESTIMATION TO USE BOTH TEMPORAL AND CROSS-SECTIONAL CORRELATIONS IN SMALL AREA ESTIMATION MODELS. TIME SERIES DERIVED FROM BIG DATA SOURCES ARE GENERALLY OBSERVED ON A HIGHER FREQUENCY THAN REPEATED SURVEYS. COMBINING THESE TIMELY AUXILIARY SERIES WITH A TARGET SERIES OBSERVED WITH A REPEATED SAMPLE OPENS THE POSSIBILITY TO IMPROVE BOTH PRECISION AND TIMELINESS OF SURVEY SAMPLE ESTIMATES.

IN THIS PRESENTATION WE SHOW HOW PRECISION AND TIMELINESS OF THE CONSUMER CONFIDENCE INDEX CAN BE IMPROVED WITH RELATED INFORMATION DERIVED FROM SOCIAL MEDIA PLATFORMS. WE ALSO PRESENT RESULTS FROM ANOTHER PROJECT WHERE 80 AUXILIARY SERIES DERIVED FROM GOOGLE TRENDS ON A WEEKLY FREQUENCY ARE COMBINES WITH A TIME SERIES OF MONTHLY FIGURES OF THE UNEMPLOYED LABOUR FORCE OBSERVED WITH THE DUTCH LABOUR FORCE SURVEY (LFS). A STATE-SPACE DYNAMIC FACTOR MODEL IS DEVELOPED TO HANDLE THE HIGH-DIMENSIONALITY PROBLEM WHEN ABOUT 80 AUXILIARY SERIES ARE INCLUDED IN A STATE-SPACE MODEL. PROPERTIES OF THE MODEL ARE TESTED IN A SIMULATION STUDY. SUBSEQUENTLY THE METHOD IS APPLIED TO NOWCAST MONTHLY UNEMPLOYMENT FIGURES USING SERIES OBTAINED WITH THE DUTCH LFS.

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