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Aggregation in Large Dynamic Panels*

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Abstract

This paper investigates the problem of aggregation in the case of large linear dynamic panels, where each micro unit is potentially related to all other micro units, and where micro innovations are allowed to be cross sectionally dependent. Following Pesaran (2003), an optimal aggregate function is derived and used (i) to establish conditions under which Granger's (1980) conjecture regarding the long memory properties of aggregate variables from 'a very large scale dynamic, econometric model' holds, and (ii) to show which distributional features of micro parameters can be identified from the aggregate model. The paper also derives impulse response functions for the aggregate variables, distinguishing between the effects of composite macro and aggregated idiosyncratic shocks. Some of the findings of the paper are illustrated by Monte Carlo experiments. The paper also contains an empirical application to consumer price inflation in Germany, France and Italy, and re-examines the extent to which 'observed' inflation persistence at the aggregate level is due to aggregation and/or common unobserved factors. Our findings suggest that dynamic heterogeneity as well as persistent common factors are needed for explaining the observed persistence of the aggregate inflation.

Keywords: Aggregation, Large Dynamic Panels, Long Memory, Weak and Strong Cross Section Dependence, VAR Models, Impulse Responses, Factor Models, Inflation Persistence.

JEL Classification: C43, E31

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