The Nature of Chain Drift

by Ludwig von Auer[1]
Universität Trier

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Abstract

A chained price index is said to suffer from chain drift bias, if it indicates an overall price change, even though the prices and quantities in the current period have reverted back to their levels of the base period. This type of bias is well documented in studies that apply sub-annual chaining to scanner data.

The underlying forces, however, are less well understood. Chain drift is usually explained by sales in connection with inventory behaviour of consumers. The present study shows that the chain drift problem is much broader. It arises also in everyday market conditions unrelated to sales and inventories. More specifically, chain drift is the net effect of two counteracting forces: *pendular* and *sticky* quantity reactions. The former is related to sales and the associated stocking behaviour, while the latter arises from delayed changes of purchasing habits due to search or adjustment costs. The former causes downward chain drift, whereas the latter generates upward chain drift. Therefore, the dominating force determines the direction of the chain drift. This insight explains why some empirical studies find downward chain drift, while other studies find exactly the opposite result even though sales occur.

The present paper also introduces a simple utility framework that captures pendular and sticky quantities arising from "unconventional" consumer behaviour such as stocking and delayed quantity responses to price changes. Building on this framework, a "stress test" is introduced that examines the resilience of price indices to chain drift. In the literature, various rolling window GEKS indices have been proposed as a solution to the chain drift problem. The stress test reveals that some variants are more immune to chain drift than others.

[1]Universität Trier, Fachbereich IV - VWL, Universitätsring 15, 54286 Trier, Germany; Email: vonauer@uni-trier.de