

# Elasticity Optimism

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## Summary

The substitutability between domestic and foreign goods is one of the most important parameters in international economics. Its calibrated value draws from literally decades of empirical work. Unfortunately, little consensus has emerged from the effort, except for two broad conclusions. First, finely disaggregated good-level quantities are more responsive to (international) relative prices than aggregates. Second, there are enormous differences between goods. Long time ago, Orcutt (1950) referred to an "elasticity pessimism", which he related to the gap between the low observed volatilities in aggregate quantities and the high volatility of international relative prices. He already conjectured that aggregates could obscure more responsive quantities at the microeconomic level. Here we ask whether this very heterogeneity may not actually be cause for optimism. We propose a correction of the elasticity of substitution between domestic and foreign macroeconomic quantities that accounts for heterogeneity at the microeconomic level.

Why should such a correction be meaningful? After all it is the response of aggregate quantities that macroeconomists are interested in, and they are undeniably much smoother than international prices. With heterogeneity however, it does not follow that the aggregate elasticity of substitution be low. For instance, Orcutt (1950) reasoned that "goods with relatively low price elasticities can display the largest variation in prices and therefore exert a dominant effect on the estimated aggregate price elasticity, thereby biasing the estimate downwards." Aggregation can create a bias because the assumption that all quantities are equally substitutable is not supported by the data. As a result there might be systematic differences between the aggregate responsiveness of traded quantities and the preference parameter it is meant to capture. It is of course the latter that should enter calibrated models. The bias we discuss matters for calibration purposes.

In macroeconomic applications, calibration exercises typically favor values of the parameter that are inferred from aggregate estimates of imports price elasticity. This is done for lack of a consensus, often because they are construed as "plausible mid-points" to the wide range of estimates the literature has uncovered. For instance, Obstfeld and Rogoff (2005) use a value of 2; Backus, Kehoe and Kydland (1994) use 1.5. When all elasticities are forced to be equal across sectors, our approach generates aggregate estimates around 2.5 for the US. This is within the ballpark of the calibrated values used in the macroeconomic literature, and suggests there is nothing special to our data or our approach relative to existing empirical work. We seem to identify the object of interest to many international economists.

With heterogeneity however aggregate elasticity estimates more than double, with values in the US up to 5. This reflects the well known fact that microeconomic elasticities tend to be high on average, and also quite dispersed. It is also the result of an appropriate, theory-implied weighting of disaggregated estimates. Does this correction matter economically? We discuss some illustrations in areas as diverse as the resolution of global imbalances, the international transmission of shocks, international risk sharing, portfolio choice, models of the real exchange rate and optimal monetary policy.