Title: Selection and Sorting of Heterogeneous Firms through the Procompetitive Effect

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Abstract:
We study how a lower entry cost and larger market size causes selection and sorting of firms with different productivity by intensifying competitive pressures. To this end, we introduce the procompetitive effect into the Melitz (2003) model of monopolistic competition with heterogeneous firms, using the H.S.A. (Homotheticity with a Single Aggregator) class of demand systems, which has many advantages relative to other non-CES demand systems used in the literature.

First, it is homothetic. Market size can be thus defined unambiguously because the composition of market demand does not matter. It also helps to isolate the effects of variable markups from those of nonhomotheticity. Furthermore, homotheticity makes it straightforward to use H.S.A. as a building block in multi-sector general equilibrium models.

Second, it is defined nonparametrically and flexible enough to allow for (but not required to impose) the choke price, as well as Marshall’s 2nd Law, which implies incomplete pass-through—less efficient firms have lower markup rates, and what we call the (weak and strong) 3rd Law, which implies--less efficient firms have no lower (under the weak 3rd Law) or strictly higher (under the strong 3rd Law) pass-through rates. Furthermore, since this class contains CES (as well as translog) as a special case, H.S.A. helps us understand which properties of the Melitz model are critically dependent on the CES assumption and which ones are not.

Third, H.S.A. retains much of the tractability of CES. This is because its single aggregator serves as a sufficient statistic for capturing any change in competitive pressures, whether caused by an entry of new firms or by a change in the prices of competing products. Indeed, simple diagrams can be used to prove the existence and uniqueness of free-entry equilibrium with firm heterogeneity and to conduct most comparative statics without parametric restrictions on the demand system and productivity distribution.

By applying H.S.A. to the Melitz model, we show, among others, that,

- An increase in competitive pressures -- whether caused by an increase in market size or a lower entry cost--,
  leads to a tougher selection of firms, larger dispersion of the profit across surviving firms under the 2nd Law
  (and of the revenue under the weak 3rd Law), and smaller dispersion of markup rates under the strong 3rd Law.
  The 2nd Law also implies that an increase in market size leads to higher (lower) profits for the more
  (less) efficient among the surviving firms and to higher revenue for the most efficient firms. Under the 2nd
  Law and the weak 3rd Law, employment is inversely related among high productivity firms.

- The impacts on the masses of entrants and of active firms often depend on whether the elasticity of the
  marginal cost distribution is increasing or decreasing in the marginal cost, with Pareto-distributed productivity
  being the knife-edge case. of marginal costs.

- Even though more competitive pressures force each firm to reduce its markup rate under the 2nd Law and to
  raise its pass-through rate under the Strong 3rd Law, they also leads to a tougher selection, which causes less
  efficient firms with lower markup rates and smaller pass-through rates to exit. Due to this composition effect,
  more competitive pressures may cause the average markup rate to go up and the average pass-through rate to
go down.

Then, in a multi-market extension, we show, among others, that, under the 2nd Law, competitive pressures are
stronger in larger markets, which causes more efficient firms to sort themselves into larger markets. Due to this
composition effect, the average markup (pass-through) rates can be higher (lower under Strong 3rd Law) in larger
(thus more competitive) markets. This result suggests a caution against testing the procompetitive effect of market
size by comparing the average markup and pass-through rates in a cross-section of cities with different sizes.

Keywords:
Monopolistic competition, heterogeneous firms, the Melitz model, H.S.A. demand system, Market size,
competitive pressures, selection, sorting, the procompetitive effect, markup rates, pass-through rates, Marshall’s
2nd and 3rd laws of demand, log-supermodularity, log-submodularity, the composition effect