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Persistency and Uncertainty Across the Academic Career

ALEXANDER PETERSEN, MASSIMO RICCABONI, IMT Lucca Institute for Advanced Studies, H. EUGENE STANLEY, Boston University, FABIO PAMMOLLI, IMT Lucca Institute for Advanced Studies — Recent shifts in the business structure of universities and a bottleneck in the supply of tenure track positions are two issues that threaten to change the longstanding patronage system in academia and affect the overall potential of science. We analyze the longitudinal publication rate $n_i(t)$ on the 1-year scale for 300 physicists $i = 1 \dots 300$. For most careers analyzed, we observe cumulative production acceleration $N_i(t) \approx A_i t^{\alpha_i}$ with $\alpha_i > 1$, reflecting the benefits of learning and collaboration spillovers which constitute a cumulative advantage. We find that the variance in production scales with collaboration radius size S_i as $\sigma_i^2 \sim S_i^\psi$ with $0.4 < \psi < 0.8$. We develop a preferential growth model to gain insight into the relation between career persistency and career uncertainty. This model shows that emphasis on nonstop production, a consequence of short-term contract systems, results in a significant number of “sudden death” careers that terminate due to unavoidable negative production shocks. Hence, short-term contracts may increase the strength of “rich-get-richer” mechanisms in competitive professions and hinder the upward mobility of young scientists.

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