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Dear Colleague:

It is my great pleasure to recommend **Sara Moreira** for a junior faculty position in your department. Sara is a very talented economist with great potential. She is one of Chicago's top students on the market this year and is among the best I have worked with during my 14 years here. I recommend that *all* departments and business schools take a close look at her.

Sara's very strong job market paper is a fine example of her talents. Its main empirical finding and motivating fact is as surprising as it is concisely summarized: The macroeconomic conditions at a business's birth have effects that are measurable for the rest of its life—or at least 30 years, as long as can be measured in this case. Put another way, businesses that start operating during recessions will be measurably smaller in terms of employment and sales over their entire lifecycle than otherwise similar businesses born during booms.

This fact is partly reminiscent of the literature looking at how the macroeconomic conditions extant at one's entry into the labor force have persistent effects. But that literature has found that those effects fade away over time. Sara shows that unlike for workers, the effects of businesses' birth conditions don't diminish with firm age.

These are economically important effects. For each standard-deviation drop in detrended output, the average entrant will have 1.6 percent lower employment. Lower forever, basically. Take a look at Table 1, panel B of Sara's paper, which plots age-specific size effects of birth-year macroeconomic conditions. The proportionate difference between firms that enter during peak versus trough macroeconomic conditions are close to constant over the first 30 years of the businesses' lives and show no sign of converging should the data be extended to a longer horizon.

It is important to note that these patterns are ubiquitous, at least across businesses in the U.S. Sara's data is from the Longitudinal Business Database, an annual panel containing the universe of business establishments having at least one employee. Moreover, the persistent birth-condition effects do not reflect shifts in the composition of businesses entering during recessions. Sara's size comparisons include industry, geographic, corporate legal structure, and calendar year fixed effects. Even within these groups, businesses are forever affected by the macroeconomic conditions at the time they open their doors.

What makes these facts doubly interesting is, if one thinks about it, a selection mechanism should tend to make businesses that actually *do* enter during recessions stronger (in some profitability sense, be it driven by cost- or demand-side advantages). This is a natural implication of most models of markets with heterogeneous-profitability-firms. Sara develops evidence for such selection: she shows entrants during downturns have higher labor productivity levels than upturn entrants. Thus even once the poor economic conditions present at their inception have receded, these businesses do not catch up to boom-entrants *despite being fundamentally stronger*.

There is an obvious question raised by all this. What mechanism supports the amazing persistence in relative sizes? One supply-side candidate is input adjustment costs, and capital adjustment costs in particular. If changing size were costly, a recession entrant might never grow to what would be its optimal size in the absence of adjustment costs. A demand-side candidate is some form of "demand capital": brand value, a customer base, reputation, or the like. In this case, a recession entrant has a smaller initial stock and, because demand feeds on itself, the business could remain consistently behind where it would be had it entered during a boom. Sara uses a clever test to distinguish between these two stories: she estimates the recession-versus-boom gap in size trajectories separately by industry, and then looks to see if these are correlated with either a) the industry's average capital-to-labor ratio or b) the extent of physical differentiation among its products. A positive correlation between persistence and capital intensity is consonant with the capital adjustment costs explanation. On the other hand, a positive correlation between persistence and the dissimilarity of the product varieties within an industry (measured using the Gollop-Monahan index, which I and others in the literature have used as a measure of demand-side substitutability) suggests the demand-side story. Sara finds that the capital intensity correlation is statistically zero, and indeed its point estimate is negative, inconsistent with supply-side-driven persistence. The correlation between persistence and product differentiation, however, is positive and significant, pointing to the properties of the demand accumulation process leading to the persistence. I'll admit that this is line with my priors. I've done some work with Lucia Foster and John Haltiwanger on demand dynamics and business growth. One thing we show is that there's just no way that even the largest capital adjustment costs estimated in the literature could explain persistent size effects more than a decade out. And Sara shows the hurdle in her context is even higher: 30 years. There's just no way that capital or any other input adjustment cost can explain the data.

To further understand the implications of what she finds, Sara augments a Hopenhayn (1992)-type heterogeneous-producer industry model. She adds three key elements: aggregate shocks (a necessity for her application), a productivity distribution of entering and exiting producers that endogenously responds to the aggregate shock, and a monopolistically competitive output market with a dynamic demand accumulation process (added of course based on the supporting evidence mentioned above). She calibrates the model and uses it to run counterfactuals that speak to several issues, including quantification of the selection effect—recall businesses that enter in recessions have better fundamentals—and estimating the aggregate implications of recessions on cohorts as they age. On this last point, she finds that entrants during the Great Recession will in total be 600,000 employees short (resulting in a loss of the same number of jobs to the economy) due to their poor initial conditions.

This paper shows off a lot of Sara's abilities: a nose for interesting questions, clear exposition of basic but novel patterns in the data, testing various explanations for those patterns, and writing down and using a model to get at quantitative questions that data alone cannot answer. These are elements we look for in our best empirical research colleagues. Sara is forming command of these building blocks, and that's why I feel her potential is so great. Not to mention that the actual result in her paper is important. It is completely novel to my knowledge, and I work in the area. It predict her results will be remembered and noticeably influence how economists in many fields think about firm dynamics.

Sara is working on some other papers that I know my colleagues who are also writing for her will cover in detail in their letters. I'll just point out that there is clearly an agenda here, with breadth and (already) some depth to it. She's well on her way to developing a full-fledged research program.

The only real concern I have about Sara's prospects on the market is that she doesn't fit field categories as cleanly many other top candidates do. Breadth and the ability to span fields is in my opinion a desirable characteristic, but I have to admit that in my experience in the profession I have seen between-field candidates slipping through the cracks. Don't let this happen in your department's hiring process. Her talents are worth it.

Stepping away from her research for a moment, while I haven't seen Sara teach, I know she has done a lot of TA work and has received good reports. She is a solid presenter in the seminar room and is improving fast. On a personal level, Sara has a very pleasant and collegial personality and will be a welcome and active member of your group.

I am very optimistic about Sara's future. She will do great work. I urge you to take a close look at her.

If I can answer any additional questions about Sara, please don't hesitate to contact me.

Sincerely,

Chad Syverson