

An Open Letter to Professors Heckman and Prescott

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You both use pertinent data to draw quantitative inferences about dynamic stochastic models of individuals' choices. Nevertheless, you disagree conspicuously about an important practical issue affecting the design of good macroeconomic policies: the magnitude of the aggregate labor supply elasticity. We write this letter because we think that now you can come closer together. That is because you Ed recently abandoned some microeconomic assumptions that you Jim found doubtful, and replaced them with ones that you Jim have seemed to favor. If you were now to incorporate an important labor supply margin that Ed's approach emphasizes but that you have occasionally neglected, your views about the size of aggregate labor supply elasticity could converge.

An important disagreement . . .

From microeconomic evidence, you Jim inferred that the aggregate labor supply elasticity is low and that therefore high tax rates on labor do little to distort the allocation of resources.¹ From macroeconomic evidence over business cycles, you Ed inferred the opposite.² Such widely disparate inferences drawn by prominent economists were troubling enough in bygone days when macroeconomics accepted not having microeconomic foundations; they are even more disturbing now when Ed's inference from business cycle observations is based on a macroeconomic model celebrated by its authors and others for its sound microeconomic foundations. Lucas and Prescott advocated those microeconomic foundations for practical

¹Carneiro and Heckman (2003, p. 196): "In a modern society, in which human capital is a larger component of wealth than is land, a proportional tax on human capital is like a nondistorting Henry George tax as long as labor supply responses are negligible. Estimated intertemporal labor supply elasticities are small, and welfare effects from labor supply adjustment are negligible."

²Prescott (2002, pp. 13, 1): "The differences in the consumption and labor tax rates in France and the United States account for virtually all of the 30-percent difference in the labor input per working-age person. . . . if France modified its intratemporal tax wedge so that its value was the same as the U.S. value, French welfare in consumption equivalents would increase by 19 percent."

reasons: their macroeconomic calibration project aspires to use microeconomic studies to gather empirically credible values of key parameters governing preferences and technologies to impose on a quantitative macroeconomic model.³

Disputed microeconomic foundations . . .

But having “microeconomic foundations” doesn’t automatically make a macroeconomic model better. Microeconomic foundations differ. Until recently, your different inferences about the aggregate labor supply elasticity came in large part from your having used different microeconomic models. Jim relied on a standard model of labor-leisure choice, ultimately set within a life cycle model in which a typical person chooses labor supply, consumption, and saving subject to opportunities to work characterized by wage processes and opportunities to save characterized by interest rates and portfolio choices. Meanwhile, Ed assumed a very different microeconomic setting that for Jim “strained credibility” (see Browning et al. (1999, p. 602)). The key decision maker in Ed’s model is not an individual worker-consumer but instead a family planner who directs the activities of a continuum of family members.⁴ Each family member has preferences much like those of the worker-consumer in one of Jim’s favored life cycle models (for example, see Heckman et al. (1998)), but different opportunities. In particular, each worker in Ed’s model is constrained by a labor supply indivisibility and is supervised by a family planner. The planner uses a lottery to manufacture employment risk with which to confront individual family members, then provides insurance that assures that family members who “win” the employment lottery (meaning they don’t work) end up consuming the same as those who “lose” the lottery (meaning they must work). The planner’s indirect one-period utility function is linear in labor, giving rise to the high labor supply elasticity that Ed used to explain the large employment responses to small real wage changes observed over the business cycle. In his Nobel lecture (see Prescott (2005, p. 385)), Ed praised the employment lotteries model as being a reliable “aggregation theory”.

The employment lottery plus complete consumption insurance strained credibility for Jim because it is difficult to observe those arrangements at the microeconomic level. Jim’s skepticism is disturbing for a macroeconomic research program based on a microeconomic foundations calibration strategy like Ed’s, one of whose principal aspirations was to unite

³Lucas (1987, p. 46). “This is the point of ‘microeconomic foundations’ of macroeconomic models: to discover parameterizations that have interpretations in terms of specific aspects of preferences or of technology, so that the broadest range of evidence can be brought to bear on their magnitudes and their stability under various possible conditions.”

⁴The representative family model with employment lotteries was proposed by Rogerson (1988) and Hansen (1985).

microeconomics and macroeconomics. Jim’s doubts left us in the disappointing situation that so long as macroeconomists’ calibrated labor supply elasticity rested on the employment lotteries underpinning Prescott’s (formerly) favorite aggregation theory, the microeconomic foundations embraced by leading business cycle theorists lacked the power to convince our microeconomic colleagues.

2006: recasting the microeconomic foundations . . .

But in 2006, things changed in ways that promise to unite macroeconomic and microeconomic approaches to labor supply. In a paper presented at the 2006 NBER Macroeconomic Annual conference, Ljungqvist and Sargent (2007) discovered that the same high labor supply elasticity that emerges from the disputed employment lotteries model would prevail also if, while retaining the labor supply indivisibility, we abandon the representative family, the employment lotteries, and complete consumption insurance and instead simply assume a life cycle setting in which each individual worker saves in the form of a risk-free bond and chooses labor supply, consumption, and savings. Under the special assumptions of no uncertainty and that the interest rate equals the consumer’s discount rate, we showed that the “time-averaging” used by the *individual* worker leads to the same aggregate labor supply elasticity implied for the representative family in the employment lotteries model. While in the employment lotteries model, it is the *fraction of people* in the household that the planner sends to work that responds to real wage changes, in the Ljungqvist-Sargent life-cycle model, it is an individual worker’s *career length* that responds. Ljungqvist and Sargent show that *off corners* for career length, the aggregate labor elasticities across the two frameworks are identical.

That 2006 paper is relevant to the quantitative issue that separates you because it showed that, while retaining only the least objectionable feature of the employment lotteries model, namely, the labor supply indivisibility, and replacing it with a modified version of the life cycle model favored by Jim,⁵ the high labor supply elasticity favored by Ed would prevail under the important caveat that the solution for career length is off corners – i.e., interior to the set of feasible career lengths.

Ed served as our discussant at the 2006 NBER Macroeconomic Annual conference (see Prescott (2007)) and used the occasion to welcome the time-averaging life cycle model of career length as a suitable replacement for the employment lotteries model that he had favored earlier. Ed further expressed his enthusiasm for the life-cycle framework when he

⁵We say ‘modified version’ because of an important change: we removed the fixed career length assumed by Jim (Heckman et al. 1998) and allowed choice of career length.

rewrote the sections of his Nobel lecture describing microeconomic foundations to republish it in the *Journal of Political Economy*.⁶ Ed also went on to adopt the life-cycle model rather than the lotteries model in subsequent work (see Prescott et al. (2009)).

A common framework and its promises ...

By relinquishing the “strained credibility” employment lotteries micro foundations in favor of the time-averaging life-cycle model favored by Jim and other labor economists, Ed has resuscitated prospects that macroeconomists really can use some findings of our microeconomic colleagues to calibrate key parameters. But while Ed’s specification conversion promises a more fruitful and direct discussion, it will not automatically lead the two of you to agree on the size of the aggregate labor supply elasticity.

A key issue ...

Your adopting a common framework for modeling individuals’ life time work-consumption-savings choices throws into high relief the issue of whether a worker’s environment leaves his or her choice of career length at an interior solution or at a corner.⁷ The fact that the high labor supply elasticity favored by Ed depends on an interior solution for career length raises challenges for all of us, both micro and macro economists. What is the evidence that rules governing retirement options in government supplied retirement programs have or will put workers on corners for career length? What are the incidences of shocks to individuals’ earnings potentials that can cause abrupt and unforeseen terminations of their lifetime labor supplies, and hence, induce *ex post* corners for career lengths?

Questions for ...

1. Jim, do you still think that the aggregate labor supply elasticity is low? If so, what impedes the force for a high elasticity inherent in the life-cycle model off corners?

In an earlier account of labor supply research (see Heckman (1993, p. 118)), you raised the possibility that those estimated high labor supply elasticities for women might converge to the lower values estimated for males as female labor-force participation rates increase. Now, when social security reforms in the U.S. and elsewhere have reduced implicit tax wedges for workers who do not retire at an official retirement age, i.e., under reforms that *de facto* put workers at interior solutions for career length,

⁶See Prescott (2005) and how the microfoundations for labor supply are changed in the new section on “The Life Cycle and Labor Indivisibility” of Prescott (2006, pp. 223–225).

⁷Ljungqvist and Sargent (2011, 2014) highlighted this important issue from various angles.

will the aggregate labor supply elasticity look more like those high female elasticities instead of those low male elasticities estimated in the past?

2. Ed, were there episodes when the aggregate labor supply elasticity was low because workers chose career lengths at corners? For example, in spite of higher taxes and more generous benefits in Europe, could it be that the similar amounts of labor supplied by males on both sides of the Atlantic before the outbreak of the European unemployment malaise in the late 1970's reflected corner solutions for career length that were induced by widespread official retirement ages of 65 and high implicit tax wedges on returns from working beyond 65?

Switching from the employment lotteries model to the time-averaging framework makes it even more evident that not only taxes but also benefits to the nonemployed need to be included when we seek to explain, e.g., differences in the trans-Atlantic employment experiences. How would you now suggest modifying your early preliminary analysis that simply decomposed earlier tax wedge calculations into tax and benefit components?⁸

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⁸Prescott (2007) responded to Ljungqvist and Sargent's (2007) criticism that he had ignored the all-pervasive welfare systems in Europe (see e.g. Prescott (2002)) by introducing government supplied nonemployment benefits and sharply reducing his estimate of the European tax wedge. Specifically, Prescott (2007) cut his calibrated marginal labor tax in Europe from his earlier estimate of 50% to only 30%. That put his estimate of the European labor tax wedge below his estimate of a U.S. labor tax rate of 33%, which Prescott left unchanged from his earlier analyses. His European tax cut allowed Prescott (2007) to introduce a nonemployment benefit in Europe that amounts to a replacement rate of 29% of after-tax earnings.

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