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Structural Estimation – Richard Evans

Problem Set 1

You cannot have your cake and eat it too. Keane and Rust want to believe that structural models give them better explanatory and predictive power at the low cost of changing assumptions. While I agree that these models may have more predictive power, I will argue that their explanatory power is inherently circular, and it may be better to not explain at all – and in certain ways, this undermines their predictive power.

Keane and Rust are both deeply tied to the notion that economic models must provide predictive and explanatory power. I agree with the first part of that statement – economics is about studying human behavior, so economic models should not be accepted for simply having sound theory if that theory does not fit the data. In many cases, Keane shows how the vague predictions of reduced form models can be refined through structural additions that make the predictions more particular and interesting.

For instance, in the case of Angrist (1990), Keane points out his result of -15% earnings for those who served in the military is subject to many criticisms, and leaving the model in reduced form makes that value almost uninterpretable. Because of factors such as the heterogeneous treatment effect, no reflection on causality, and possible endogeneity between the lottery and behavior, the paper fails to show anything more than the relative earnings of those who happened to serve in the military at the same time as the draft, and those who did not serve. Keane argues without the assumptions of a structural model, this model will lack meaningful predictive power. I must agree that Keane’s reasoning seems fair – without interpretable results, what is the model even predicting? And even if it can be interpreted, as in Angrist’s work, it is very likely meaningless.

Beyond predictive power, Keane and Rust argue about the explanatory power of these models – because of their various assumptions, they are able to interpret the data such as to reach reasonable interpretations of their results. My disagreement comes on this point. I simply cannot see how they so blindly follow this paradigm without question – they do agree that they are relying on a host of assumptions in order to interpret their results, and yet they continue to assert that these interpretations should be valid. I am not arguing that assumptions should not made, as it is clear that both approaches to modeling behavior require assumptions. But if assumptions are to be made, those predictions should be very carefully attenuated. Keane himself argues that the complexity of the assumptions of many structural models makes it nearly impossible to evaluate how those assumptions affect parameter estimations.[[1]](#footnote-1)

Given these caveats, I find it dangerous for this field to be making “predictions of causality, [testing] theories of behaviors, [estimating] underlying primitives such as preferences and beliefs, and [making] predictions of how hypothetical policy changes will affect behavior and individual welfare” when those predictions or estimations are not based on anything testable.[[2]](#footnote-2)

It is because of this ambiguity that I ultimately find the predictive power questionable. Yes, a structural model may predict some value. And in certain cases, that value is clearly defined and that predictive power is useful. Yet, in other cases, if the value is being uncovered through the various assumptions of a structural model, how is it to be fairly interpreted? Perhaps it is better to have the interpretation available as an alternative to the reduced form model, which in many cases does not even claim to be interpretable, but perhaps it is better to avoid the danger of making unverifiable explanatory claims.

Both structural and reduced form models have their advantages and (moreso) shortcomings. I do believe there is a preferable approach to economics that simply has not yet been discovered that does that require the myriad assumptions present in these two approaches, although so long as these are the only options, the inability to reduced form models to make even reasonable interpretations draws me away from using them. However, even a preference for structural models is not acknowledgement of their perfection.

1. Keane, p. 17 [↑](#footnote-ref-1)
2. Rust, p. 22 [↑](#footnote-ref-2)