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A Clarification Regarding NBER Working Paper 33643

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Abstract

This note clarifies the identifying assumptions underlying the approach in Bell (2020) and addresses a specific misinterpretation appearing in Mas (2025). That secondary source stated that the method requires independence between workers' productivity and preferences over amenities. This characterization is not implied by the method, nor any previous iterations of it. Identification instead relies on a conditional independence assumption that pertains to a third observed variable, such as education, which the method casts as a shifter of individuals' offer sets. The assumption stipulates that the shifter must be relevant to the quality of the offer set, but irrelevant to how workers split their compensation into pay versus amenities conditional on the quality of the offer set. Contrary to the Mas (2025) critique, the model in fact allows for arbitrary correlations between productivity and preferences. This note's purpose is to clarify the record regarding these identifying assumptions, which in turn shape how empirical evidence using this approach is evaluated in practice.

JEL classification

J31, J24, C26

Keywords

job amenities, compensating differentials, identification, anti-instrument, latent job quality, labor supply, wage-amenity tradeoff

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1 Introduction

Estimating the hidden tradeoff workers face when choosing between jobs with better pay versus other job amenities is a central problem in labor economics. A long-recognized key challenge in this literature is that workers differ in their access to job opportunities: unobserved factors such as ability, search frictions, or firm-specific advantages affect access to both wages and amenities, complicating the identification of compensating differentials from observational data. Recent work has proposed approaches that address this challenge by treating unobserved job quality as a latent variable and leveraging observable shifters of that offer set to recover the equilibrium tradeoff between wages and amenities.

This note is motivated by a specific misunderstanding of the approach put forward by Bell (2020). That misunderstanding has frequently been attributed to Mas (2025), a pre-print of the recently published *Handbook of Labor Economics* chapter on non-wage amenities. That paper characterizes the method as relying on an unrealistic assumption that individual productivity does not directly affect preferences over amenities. Subsequent versions of the NBER working paper and the published *Handbook* chapter omit this characterization, but do not replace it with a statement of the true identifying assumptions. (Rather than correct the assumption, the current version removes any reference of this method.) In practice, this has left ambiguity about how the approach should be interpreted, which raises the need for a clear and self-contained clarification.

Because the NBER working paper was widely circulated and serves as a reference point for researchers seeking to understand this approach, this interpretation has implications for how the method is evaluated in practice and therefore for how empirical evidence using this approach is judged. This characterization has shaped assessments of both the identifying assumptions and the credibility of empirical results for many works.

This note clarifies the identifying assumptions underlying the approach in Bell (2020). The method treats unobserved job quality as a single latent index that jointly determines wages and amenities, and uses an observed shifter of that index as an "anti-instrument" to recover the hidden tradeoffs workers face when choosing between greater pay and greater amenities – often called "compensating differentials." Identification relies on a conditional independence restriction: if the latent job quality index were fully observed, the anti-instrument would provide no additional information

about preferences over amenities. Importantly, and in contradiction to the NBER publication, this restriction does not impose any assumption about the relationship between productivity and preferences.

Mas (2025) provides a clear and useful framing of the central challenge in this literature, emphasizing the role of variation in market utility as a source of bias in estimating compensating differentials. This perspective aligns closely with the motivation for the approach in Bell (2020). This note addresses and provides a reference for a specific interpretation that does not follow from this approach but has nonetheless shaped how it is evaluated in practice.

2 Model and Identifying Assumptions

Consider a setting in which workers choose among jobs that differ in wages w and a non-wage amenity z. Let η denote a latent index of job quality that captures all factors affecting a worker's opportunity set. The researcher does not observe η, but observes a proxy h.[1]

Identification relies on three assumptions:

Assumption 1 (Single Index). Jobs that share the same w and z share the same single index of quality η.

Assumption 2 (Monotonic Relevance). The anti-instrument h is informative about η, and $\mathbb{E}[h|\eta]$ is monotone in η.

Assumption 3 (Conditional Independence). h is irrelevant to the job choice problem if we observe η. Formally, $(w, z) \perp h|\eta$.

These assumptions allow h to be used as an anti-instrument for the latent confounder η. Researchers rely on these assumptions to identify the slope of the hedonic wage function with respect to amenities while holding fixed η.

3 Clarifying the Misinterpretation

Mas (2025) interprets the approach in Bell (2020) as requiring that productivity does not directly affect preferences over amenities. This interpretation does not follow from the identifying assumptions.

[1] Mas (2025) describes this same underlying problem in Section 3.3 as unobserved "Variation in Market Utility."

Importantly, these assumptions do not impose restrictions on the relationship between productivity and preferences. In particular, despite bearing some superficial resemblance to the Conditional Independence assumption, there is no assumption that $(w, z) \perp \eta$, nor is this condition implied by these assumptions. The identifying assumptions allow for any possible correlation of productivity and preferences.

4 Implications

The method does not require independence between productivity and preferences. Instead, it requires that residual variation in the anti-instrument be conditionally independent of preferences, given latent job quality.

Evaluating the approach therefore depends on the choice of proxy and the plausibility of this conditional independence restriction. Misinterpreting this distinction has led to incorrect conclusions about the method's assumptions and empirical credibility.

5 Conclusion

This note clarifies the identifying assumptions underlying Bell (2020) and addresses a misinterpretation appearing in Mas (2025). The model does not require independence between productivity and preferences. It instead relies on a more realistic conditional independence restriction that treats an observed variable as a pure shifter of a worker's offer set when identifying the tradeoff workers face between pay and non-pay amenities. For a survey of empirical applications implementing this approach, see Bell (2025).

6 References

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