Meng-Chi Tang "Medical Provider Agency and Pharmaceutical Demand with Universal Coverage: Evidence from Taiwan"

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1. What is the question?

由於台灣健保機制的設計，台灣的醫療提供者擁有開藥、配藥，並獲得政府補貼的權力。這導致了一個可能的代理人問題：醫療提供者開藥時，可能更在乎自身利益，而不是病人的病況。本文利用實證資料，檢視抗糖尿病藥物的市場需求，希望能找到證據支持這個 claim。

2. Why should we care about it?

對病人而言，這當然是個嚴重的問題，因為醫院可能會為了獲利，而去開較沒療效的藥物。再來，這種代理人問題與全民健保 (universal coverage)的機制有關。目前許多國家都在朝全民健保邁進，因此，本研究對於他們該如何管制、設計全民健保系統，會相當有幫助。

Real World Example: 台灣健保的負擔相當嚴重，而由於全民健保的設計，之前新聞時常見到民眾濫用醫療資源、導致健保負擔增加的 claim。然而，這些新聞所沒想到(或沒揭露)的是，醫療提供者也可能濫用全民健保的設計，利用開藥、配藥來獲利，進而增加健保負擔。這其實是非常嚴重的問題，因為若是此狀況發生，病人可能會更難康復 (因為醫療提供者並不以治病為主要目的)，進而讓人民更頻繁去看醫生，導致健保負擔更進一步增加。

3. What is your answer?

醫生自營 (physician-owned)的醫療機構，傾向於開非專利藥 (generic drug)以及昂貴的藥；而公家經營 (public-owned)的醫療機構則相反。因此，代理人問題的確存在。另外，醫療提供者對於非專利藥的價格較不敏感。診所相較於醫院，對於藥物價格則是較為敏感。

本文另外進行了 counterfactual analysis，發現此代理人問題會大幅降低病人的福利；在醫療機構完全由政府經營的狀況下，病人福利每年甚至會下降超過一百萬美元。至於台灣 2014 年發布的"triple equivalence" policy，以及民眾部分負擔份額 (copayment)改變時的影響，由於福利損失與健保支出改變的效果會互相抵銷，因此影響大小較難預估。

4. How did you get there?

本研究資料來自於台灣的全民健康保險研究資料庫 (National Health Insurance Research Database, NHIRD)，檢視醫療提供者每月要求健保補助的相關資料，包含開藥內容、醫生特質、醫院 (或診所) 特質等等。此外，本文只使用了糖尿病的開藥資料來研究。

本文中，代理人問題被定義為醫療提供者的 utility 對於療法選擇的影響。作者利用 two-stage structure model 來解釋醫療提供者與病人之間的關係。在 first stage estimation，作者使用 logit estimation 來估計代理人問題的效果；在 second stage estimation，作者使用 two-stage least squares estimation 來估計醫療提供者對於各種抗糖尿病藥物的需求曲線。

變數名稱一覽表

i	Index of medical provider, $i = 1, ..., I$.
t	Index of month, $t = 1, ..., T$.
j	The chosen oral hypoglycemic agent (OHA) for its patient in each month t, $j = 1, ..., J_t$. j=0 indicates no drugs prescribed.
U_{ijt}	$U_{ijt} = U_{ijt}(\pi, u)$, Provider i's utility gained from prescribing OHA j to its patient in month t, where π, u are the provider's and patient's utility respectively from receiving the treatment. $$U_{ijt}(\pi, u, x) = \sum_k x^1_{jkt}\alpha_{ikt} + \sum_k x^2_{jkt}\beta_{ikt} + \xi_{it} + \varepsilon_{ijt}$$
x^1_{jkt}	Observed product characteristics, including the drug price and whether the drug is generic.
x^2_{jkt}	$x^2_{jkt} = (D_j, x^{2\prime}_{jkt})$ represents other observed product characteristics including vintage, import, and whether the manufacturer lists their company on the stock market in Taiwan. D_j is dummy variable, $D_j = 1$ if the jth drug is prescribed.
ξ_{it}	The product characteristic that is unobservable to econometricians, such as drug quality.
ε_{ijt}	Error term.
α_{ikt}	$\alpha_{ikt} = \overline{\alpha}_{kt} + \sum_r z^1_{irt}\alpha_{krt}$. z^1_{irt} includes the dummy variables indicating physician and government ownership, eimbursement claim value from each treatment and the patient's share of that expense.
β_{ikt}	$\beta_{ikt} = \overline{\beta}_{kt} + \sum_r z^2_{irt}\beta_{krt}$. z^2_{irt} includes the provider's other characteristics, including patient's sex, age, and the seriousness of their diabetes; physician's experience; and hospital's years of operation, size, and location.
δ_{jt}	Product-specific constant term that is common among providers. $$\delta_{jt} = \sum_k x^1_{jkt}\overline{\alpha}_{kt} + \sum_k x^2_{jkt}\overline{\beta}_{kt} + \xi_{it}$$
Pr_{it}	$Pr_{it}(j|z^1_i, z^2_i, x^1_j, x^2_j; \alpha, \beta, \delta)$, the probability of provider i choosing an OHA j in month t, which is the logit form conditional on (z^1_i, z^2_i).
$\in_{ij}$	The individual price elasticity of the jth OHA.
$\in_{ijk}$	The cross-price elasticity between the OHAs j and k.