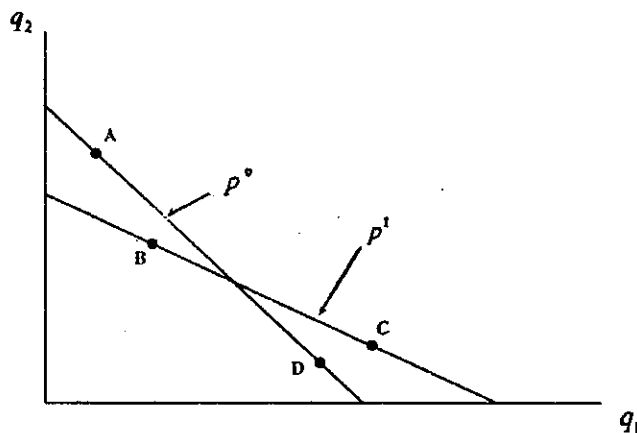


1. In the diagram below,  $p^t = (p_1^t, p_2^t)$  denotes the price vector of good 1 and good 2 at time  $t$ , and  $q_1$  and  $q_2$  are the quantities of the two goods. The weak axiom of revealed preference (WARP) states that "If a commodity bundle, say bundle 1, is directly revealed preferred to bundle 2, and the two bundles are not the same, then it cannot happen that bundle 2 is directly preferred to bundle 1." Based on this definition, check if WARP is violated when the observed bundle at time 0 and time 1 are: (1) A & B; (2) A & C; and (3) B & D. (12%)



2. The classical measures of welfare change are based on either compensating variation (CV) or equivalent variation (EV). Consider the case of a two-good world in which a rational consumer experiences an increase in the price of good 1. Define CV and EV and graphically illustrate that consumer's surplus measured from compensated demand under the notion of CV (EV) sets the upper (lower) bound for the change in welfare due to this price variation. (14%)

3. Suppose that in addition to labor input, the firm uses capital input,  $K_i (i = 1, 2, 3)$ , to produce three output levels,  $q_i (i = 1, 2, 3)$ , in the long run.

(1) Use the isoquant map to illustrate that when the firm's capital input is fixed at  $K_3$ , even if the firm is minimizing cost, the cost to produce each of the three output levels are usually higher than the minimal cost to produce those output levels, i.e.,  $SC(q_{i \neq 3}) > C(q_i)$ . (12%)

(2) Graphically illustrate that in the long run, a cost-minimizing firm's employment of labor is more responsive to the change in wage rate when the rational firm pursues profit maximization. (12%)

見背面

4. 考慮一個經濟成長是根據外生 Solow 成長模型的世界，假設某國的人口成長率為 0%，儲蓄率為 30%，折舊率為 10%，而生產函數為

$$Y = zF(K, N) = (KN)^{0.5}$$

其中  $K$  表示資本存量， $N (=100)$  表示人口數。

- (a) 求此國的 Steady State 時的  $K$ ，以及儲蓄和消費總額。(6%)
- (b) 請問目前的儲蓄率是 Golden Rule 的儲蓄率嗎？若是，請證明之。若不是，請求 Golden Rule 的儲蓄率。(6%)
- (c) 假設這個世界有兩國，目前 ( $t=1$ ) 的  $K$  分別為 400 以及 100，其他條件如同題幹所述，請問  $t=2$  時兩國的  $K$  將分別變成多少？(6%)
- (d) 承上，請在同一張圖上，畫出兩國  $K/N$  與下一期的  $K/N$  的關係圖，並請盡量精準畫圖。這是一個 concave 還是 convex 的曲線？(6%)
- (e) 承上，兩國  $K$  相除是越來越小還是越來越大？請證明你的答案。並說明這代表的意義。(6%)
5. 假設某人在年輕時中了樂透，獎金為  $m_0$ ，決定從此不再工作（所以沒有任何其他收入），所以他每期的決策就是要花多少錢在消費上 ( $c_t$ )，以及要存下多少錢給未來消費 ( $m_t$ )，且他所面對的利率固定為  $r$ 。假設此人總共活三期（年輕、中年以及老年），一生的總效用為：

$$u(c_1) + \beta u(c_2) + \beta^2 u(c_3)$$

且  $u(c) = \ln c$ 。請寫出此人的效用極大化問題，並求解之。(20%)

試題隨卷繳回