

The Employability Theorem

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Abstract

In this document, the Employability Theorem is demonstrated from a set of fairly tautological axioms, which are presupposed in quantitative career choice and career development methods.

Keywords: Employability theorem; Career choice; Career development; Vocational choice; Occupational Information Network; O*NET.

1. Proof Plan

Time allocation by difficulty level:

$$\text{ta}_q(\bar{l}) = \frac{\text{ttc}(\bar{l})}{\int_0^1 \text{ttc}(l) dl} \quad (1)$$

Employment by difficulty level:

$$w_q(\bar{l}) = w_q \times \text{ta}_q(\bar{l}) \quad (2)$$

Employability per occupation:

$$\tilde{w}_q^k = \tilde{w}_q(l_q^k) = \int_0^1 T(l, l_q^k) w_q(l) dl \quad (3)$$

$$= \int_0^1 [l_q^k \geq l] w_q \text{ta}_q(l) dl \quad (4)$$

$$= w_q \left(\int_0^{l_q^k} 1 \times \text{ta}_q(l) dl + \int_{l_q^k}^1 0 \times \text{ta}_q(l) dl \right) \quad (5)$$

$$= w_q \int_0^{l_q^k} \text{ta}_q(l) dl \quad (6)$$

And with $l_q^k = \tilde{Y}_q^k = \tilde{Y}(\mathbf{a}_k, \mathbf{a}_q) = Y(\mathbf{a}_k, \mathbf{a}_q) / Y(\mathbf{a}_q, \mathbf{a}_q)$,

$$\tilde{w}_q^k = w_q \int_0^{\tilde{Y}_q^k} \text{ta}_q(l) dl \quad (7)$$

Aggregate employability (entire economy):

$$\tilde{w}_k = \tilde{w}_{11}^k = \tilde{w}_k(1, 1) = \sum_{q=1}^n [\tilde{Y}_q^k \ddot{\tau}_{kq}^\theta \geq 0.5] \tilde{w}_q^k \quad (8)$$

$$= \sum_{q=1}^n \left([\tilde{Y}_q^k \ddot{\tau}_{kq}^\theta \geq 0.5] \int_0^{\tilde{Y}_q^k} w_q \text{ta}_q(l) dl \right), \quad (9)$$

$$\tilde{Y}_q^k = \tilde{Y}(\mathbf{a}_k, \mathbf{a}_q) = \frac{\prod_{i=1}^m \max(1 + a_i^k, 1 + a_i^q)^{\sigma_i^q}}{\prod_{i=1}^m (1 + a_i^q)^{\sigma_i^q}}, \quad (10)$$

$$\sigma_i^q = \frac{a_i^q}{\sum_{i=1}^m a_i^q} \quad (11)$$

P.S.: think of a notation for economic taxa / aggregation levels.

Aggregate employability (particular subset of the economy):

$$\tilde{w}_{?!}^k = \tilde{w}_k(?, !) = \sum_{q=1}^n [q \in ?!] [\tilde{Y}_q^k \ddot{\tau}_{kq}^\theta \geq 0.5] \tilde{w}_q^k \quad (12)$$

$$= \sum_{q=1}^n \left([q \in ?!] [\tilde{Y}_q^k \ddot{\tau}_{kq}^\theta \geq 0.5] \int_0^{\tilde{Y}_q^k} w_q \text{ta}_q(l) dl \right), \quad (13)$$

$$\tilde{Y}_q^k = \tilde{Y}(\mathbf{a}_k, \mathbf{a}_q) = \frac{\prod_{i=1}^m \max(1 + a_i^k, 1 + a_i^q)^{\sigma_i^q}}{\prod_{i=1}^m (1 + a_i^q)^{\sigma_i^q}}, \quad (14)$$

$$\sigma_i^q = \frac{a_i^q}{\sum_{i=1}^m a_i^q} \quad (15)$$

Notation for operation output (\mathcal{U} is IPA's symbol for the “double-o” sound, e.g. as in the word “boot”):

$$\mathcal{U}_q^k = \lfloor Y_q^k \rfloor \quad (16)$$