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1401 A Study of Consumption Decisions and Wealth, Individual Data, Political Economy and Theory
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1406 James E Curtis Jr
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1415 James Curtis Jr presents decision-making considerations of “individuals” in an economy with
1416 grouped individuals, owners of firms, and social planner(s), conditional on
1417 wealth constraints with applied social economic considerations.
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1420 JEL Codes: J7 D9 E2 C2 H5 N3
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1453 **I. Case One: Agent-Specific Constraints**

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1456 $\text{MAX}_{\{x_{nij} \geq 0\}}$ $\mathbf{U} = \gamma_{\mathbf{U}} \prod_{SP=1} \mathbf{U}_{SP}^{\theta(SP)}$

1457

1458 *subject to* $\mathbf{X}_{ijSP} \leq \mathbf{E}_{ijSP}$

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1460

1461 *Let:* $\mathbf{U}_{SP} = \gamma_{\mathbf{U}(SP)} \prod_{j=1} (\prod_{i=1} \mathbf{u}_{ij(SP)}^{\theta_{ij(SP)})}$

1462

1463 *such that* $\mathbf{U} = \gamma^* \prod_{SP=1} [\prod_{j=1} (\prod_{i=1} \mathbf{u}_{ij(SP)}^{\theta^*})]$

1464

1465 *where* $\gamma^* = \gamma_{\mathbf{U}} \prod_{SP=1} \gamma_{\mathbf{U}(SP)}$

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1467 $\theta^* = \theta_{ij(SP)} \theta_{(SP)}$

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1470 *Further, let:* $\mathbf{u}_{ijSP} = \gamma_{\mathbf{u}ijSP} \prod_{n=1} (\mathbf{x}_{(n)ij} \mathbf{s}_{\mathbf{x}(n)ijSP})^{\alpha(n)}$

1471

1472 *such that* $\mathbf{U} = \gamma' \prod_{SP=1} [\prod_{j=1} (\prod_{i=1} (\prod_{n=1} (\mathbf{x}_{(n)ij} \mathbf{s}_{\mathbf{x}(n)ijSP})^{\alpha(n)'}))]$

1473

1474 *where* $\gamma' = \gamma_{\mathbf{U}} [\prod_{SP=1} \gamma_{\mathbf{U}(SP)} (\prod_{j=1} (\prod_{i=1} \gamma_{\mathbf{u}ijSP}))]$

1475

1476 $\alpha(n)' = \alpha(n) \theta_{ij(SP)} \theta_{(SP)}$

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1479 *Further, let:* $\mathbf{E}_{ijSP} = \sum_{n=1} \mathbf{p}_{\mathbf{x}(n)} \mathbf{e}_{\mathbf{x}(n)ijSP} + \mathbf{p}_{\mathbf{x}(l)} \mathbf{e}_{\mathbf{x}(l)ij} + \mathbf{e}_{ijSP}$ for all $n = 1, 2, \dots, E \neq l$

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1482 *Further, let:* $\mathbf{X}_{ij} = \sum_{n=1} \mathbf{P}_{\mathbf{x}(n)} \mathbf{x}_{(n)ij} + \mathbf{p}_{\mathbf{x}(l)} \mathbf{x}_{(l)ij}$

1483

1484 *where* $\mathbf{P}_{\mathbf{x}(n)j} = \mathbf{p}_{\mathbf{x}(n)} (1 + \delta_{xjg} + \sum_{q=1} t'_{qx(n)})$

1485

1486 $\mathbf{P}_{\mathbf{x}(E)} = \eta(\mathbf{B})$

1487

1488

1489 *Therefore, the decision becomes:*

1490

1491 $\text{MAX}_{\{x_{nij} \geq 0\}}$ $\mathbf{U} = \gamma' \prod_{SP=1} [\prod_{j=1} (\prod_{i=1} (\prod_{n=1} (\mathbf{x}_{nij} \mathbf{s}_{\mathbf{x}(n)ijSP})^{\alpha(n)'}))]$

1492

1493 *subject to* $\sum_{n=1} \mathbf{P}_{\mathbf{x}(n)j} \mathbf{x}_{(n)ij} + \mathbf{p}_{\mathbf{x}(l)} \mathbf{x}_{(l)ij} \leq \sum_{n=1} \mathbf{p}_{\mathbf{x}(n)} \mathbf{e}_{\mathbf{x}(n)ijSP} + \mathbf{p}_{\mathbf{x}(l)} \mathbf{e}_{\mathbf{x}(l)ij} + \mathbf{e}_{ijSP}$

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1495

1496 *Further, let:* $\sum_{n=1} \mathbf{p}_{\mathbf{x}(n)} \mathbf{e}_{\mathbf{x}(n)ijSP} + \sum_{v=1} \mathbf{w}_v \mathbf{h}_{vij} = \mathbf{W}_{ij}$

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1498 *where* $\mathbf{w}_v = \mathbf{p}_{\mathbf{x}(l)}$

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1500 $\mathbf{h}_{vij} = \mathbf{e}_{\mathbf{x}(l)ij} - \mathbf{x}_{(l)ij}$

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1502 **II. Case Two: One Universal Constraint**

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$$\mathbf{MAX}_{\{x_{nij} \geq 0\}} \mathbf{U} = \gamma_{\mathbf{U}} \prod_{SP=1} \mathbf{U}_{SP}^{\theta(SP)}$$

Subject to $\mathbf{X} \leq \boldsymbol{\varepsilon}$

Further, let: $\boldsymbol{\varepsilon} = \sum_{SP=1} \mathbf{E}_{SP} + \mathbf{e}$

$$\mathbf{E}_{SP} = \sum_{i=1} \sum_{j=1} \mathbf{E}_{ijSP} + \mathbf{e}_{SP}$$

$$\mathbf{E}_{ijSP} = \mathbf{E}_{x(n)ijSP} + \sum_{i=1} \sum_{j=1} \mathbf{p}_{x(l)} \mathbf{e}_{x(l)ij} + \mathbf{e}_{ij} \text{ for all } n = 1, 2, \dots, E \neq l$$

$$\mathbf{E}_{x(n)ijSP} = \sum_{n=1} \mathbf{p}_{x(n)} \mathbf{e}_{x(n)ijSP}$$

such that $\boldsymbol{\varepsilon} = \sum_{i=1} \sum_{j=1} \sum_{n=1} \mathbf{p}_{x(n)} \mathbf{e}_{x(n)ijSP} + \sum_{i=1} \sum_{j=1} \mathbf{p}_{x(l)} \mathbf{e}_{x(l)ij} + \mathbf{e}^*$

where $\mathbf{e}^* = \mathbf{e} + \sum_{SP=1} \mathbf{e}_{SP} + \sum_{i=1} \sum_{j=1} \mathbf{e}_{ij}$

Further, let: $\mathbf{X} = \sum_{i=1} \sum_{j=1} \sum_{n=1} \mathbf{P}_{x(n)j} \mathbf{x}_{(n)ij} + \sum_{i=1} \sum_{j=1} \mathbf{p}_{x(l)j} \mathbf{x}_{(l)ij}$

where $\mathbf{P}_{x(n)j} = \mathbf{p}_{x(n)} (1 + \delta_{xjg} + \sum_{q=1} t'_{qx(n)})$

$$\mathbf{P}_{x(E)} = \eta(\mathbf{B})$$

Therefore, the decision becomes:

$$\mathbf{MAX}_{\{x_{nij} \geq 0\}} \mathbf{U} = \gamma' \prod_{SP=1} [\prod_{j=1} (\prod_{i=1} (\prod_{n=1} (\mathbf{x}_{nij} \cdot s_{x(n)ijSP})^{a(n)}))]]$$

subject to $\sum_{i=1} \sum_{j=1} \sum_{n=1} \mathbf{P}_{x(n)j} \mathbf{x}_{(n)ij} + \sum_{i=1} \sum_{j=1} \mathbf{p}_{x(l)j} \mathbf{x}_{(l)ij} \leq \sum_{i=1} \sum_{j=1} \sum_{n=1} \mathbf{p}_{x(n)} \mathbf{e}_{x(n)ijSP} + \sum_{i=1} \sum_{j=1} \mathbf{p}_{x(l)} \mathbf{e}_{x(l)ij} + \mathbf{e}^*$

Let: $\sum_{i=1} \sum_{j=1} \sum_{n=1} \mathbf{p}_{x(n)} \mathbf{e}_{x(n)ijSP} + \sum_{v=1} \sum_{i=1} \sum_{j=1} \mathbf{w}_v \mathbf{h}_{vij} = \sum_{i=1} \sum_{j=1} \mathbf{W}_{ij}$

where $\mathbf{w}_v = \mathbf{p}_{x(l)}$

$$\mathbf{h}_{vij} = \mathbf{e}_{x(l)ij} - \mathbf{x}_{(l)ij}$$

1547 **III. A Model of Wealth**

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1550 *Let:* $\mathbf{W}_{ij} = (1-g-\sum_{q=1} t_q) \mathbf{I}_{ij} + \mathbf{A}_{ij} + (1-g)(\sum_{q=1} \mathbf{S}_{qij} + \mathbf{C}_{ij}) - \mathbf{G}_{ij}$

1551

1552 $\mathbf{I}_{ij} = \sum_{v=1} \mathbf{w}'_v \mathbf{h}'_{vij}$

1553

1554 $\mathbf{w}'_v = \mathbf{w}_v - \delta_{w(v)jg} - \sum_{q=1} t'_q$

1555

1556 $\mathbf{h}'_{vij} = \mathbf{h}_{vij} - \delta_{h(v)jg}$

1557

1558 $\mathbf{A}_{ij} = [\mathbf{A}_{0ij}(1-g-\sum_{q=1} t_{qA(0)}) + \sum_{a=1} \mathbf{N}_{(1,a)ij}(\mathbf{R}_i, \mathbf{M}_i)(1-g-\sum_{q=1} t_{qN(1,a)})$

1559

1560 $+ \sum_{m=1} \gamma_{\pi(m)ij} \boldsymbol{\pi}_{Z(m)ij}(1-g)] (1 + \gamma_{\rho ij} \rho) (1 - \sum_{q=1} t_{q\rho})$

1561

1562 $+ \sum_{b=1} \mathbf{N}_{(2,b)ij}(\mathbf{R}_i, \mathbf{M}_i)(1-g - \sum_{q=1} t_{qN(2,b)}) - \mathbf{G}_{\rho ij} - \delta_{A_j g}(\rho, \mathbf{A}_{0ij})$

1563

1564 $\mathbf{A}_{0ij} = \mathbf{A}_{0ij}(\mathbf{x}_{n0}, \gamma_{w(0)ij} \mathbf{W}_0 F(\mathbf{I}_0(\mathbf{w}_0, \mathbf{h}_0, \mathbf{S}_0), \mathbf{A}_0(\mathbf{A}_{(-1)}, \mathbf{N}_0(\mathbf{R}_0, \mathbf{M}_0), \gamma_0 \pi(m) \boldsymbol{\pi}_{0Zm}), t_{0q}, \delta_{0g}, \gamma_{0\rho}), \mathbf{R}, \mathbf{M})$

1565

1566 $\boldsymbol{\pi}_{Z(m)ij} = (\mathbf{P}_{Z(m)j} \mathbf{Z}_{mij} + \sum_{q=1} \mathbf{S}_{qZ(m)ij} - \sum_{d=1} \mathbf{P}_{Z(m,d)j} \mathbf{X}_{Z(m,d)ij}) (1 - \sum_{q=1} t_{q\pi(m)})$

1567

1568 $\mathbf{P}_{Z(m)j} = \mathbf{p}_{Z(m)j} (1 - \delta_{Z(m)jg} + \sum_{q=1} t'_{qZ(m)})$

1569

1570 $\mathbf{Z}_{mij} = \gamma_{Zmij} \prod_{d=1} \mathbf{X}_{Z(m,d)ij}^{\beta(d)}$

1571

1572 $\mathbf{P}_{Z(m,d)j} = \mathbf{p}_{Z(m,d)j} (1 - \delta_{Z(m,d)jg} - \sum_{q=1} t'_{qZ(m)})$

1573

1574 $\mathbf{X}_{Z(m,d)ij} = \mathbf{x}_{Z(m,d)ij} - \delta_{Z(m,d)jg}$

1575

1576 *where*

1577 $\mathbf{S} \equiv$ subsidies,

1578 $g \equiv$ tithe,

1579 $\mathbf{G} \equiv$ giving,

1580 $q \equiv$ governments,

1581 $\mathbf{C} \equiv$ social capital,

1582 $\rho \equiv$ the rate of return,

1583 $\gamma \equiv$ the knowledge on scaling the rate of return,

1584 $d \equiv$ inputs,

1585 $\mathbf{N}_1 \equiv$ appreciative,

1586 $\mathbf{N}_2 \equiv$ non-appreciative

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