New Socialist Suburbs: How strong are the rural-urban linkages in Shanghai?

David Roland-Holst
UC Berkeley

Weibo Xing
Peking University

ASEM/DRC Workshop on
Capacity for Regional Research on
Poverty and Inequality in China

Tuesday, March 28, 2006
Contents

I. Introduction and Motivation
II. Overview of the Shanghai SAM
III. Multiplier Decomposition Analysis
IV. Conclusions
I. Introduction

• While the majority of China’s population remains in relatively low income rural areas, urban living standards have risen sharply.
• In its commitment to promote economic convergence between these areas, the Chinese government has developed the New Socialist Countryside policy.
• In addition to such targeted policies, a primary means for rural households to leave poverty will remain participation in China’s urban growth phenomenon.
• In this paper, we examine rural-urban income linkages for the Shanghai region, a very dynamic urban area which still includes a significant rural periphery.

• Although Shanghai is China’s largest urban area, 25% of household income in the Shanghai goes to households classified as rural.

• Careful examination of rural-urban expenditure linkages can support more effective policies for rural poverty alleviation.
Income is Rising in China…
(2000 USD and growth rate)
but so is inequality.
Two Vital Rural-Urban Linkages

- Labor Markets: Rural migrants remain an important source of new entrants to the urban labor force, where their earnings generate substantial remittance income for rural households.
- Food Markets: About two-thirds of farm income still comes from marketed agricultural surplus in China, and rising incomes in cities are creating many new opportunities for enterprising farmers.
Chinese Diets are Changing

New foods are more resource intensive, with higher value added.
## II. Overview of the Shanghai SAM

<table>
<thead>
<tr>
<th>I. Production (53 sectors)</th>
<th>II. Factors (Lab, Cap, Land)</th>
<th>III. Households (Rur, Urb)</th>
<th>IV. Ent, Gov</th>
<th>V. Taxes</th>
<th>VI. Row</th>
<th>VII. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>T11</td>
<td>O</td>
<td>T13</td>
<td>T14</td>
<td>O</td>
<td>T16</td>
<td>Y1</td>
</tr>
<tr>
<td>T21</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>Y2</td>
</tr>
<tr>
<td>O</td>
<td>T32</td>
<td>O</td>
<td>T34</td>
<td>O</td>
<td>O</td>
<td>Y3</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>T45</td>
<td>O</td>
<td>Y4</td>
</tr>
<tr>
<td>T51</td>
<td>T52</td>
<td>T53</td>
<td>T41</td>
<td>O</td>
<td>O</td>
<td>T41</td>
</tr>
<tr>
<td>T61</td>
<td>T62</td>
<td>T63</td>
<td>T64</td>
<td>O</td>
<td>T66</td>
<td>T41</td>
</tr>
<tr>
<td>Y1</td>
<td>Y2</td>
<td>Y3</td>
<td>Y4</td>
<td>Y3</td>
<td>Y4</td>
<td>Y4</td>
</tr>
</tbody>
</table>
Sectoral Aggregation

- 5 Agricultural sectors
- 6 Mining sectors ➔ 1 Mining
- 28 Manufactory sectors ➔ 17 sectors
- 3 sectors of Electricity, Gas, Water was aggregated
- 3 types of Governments and 9 Taxes, ➔ 1 Gov
- A 42×42 SAM, including 34 production, 3 kind of labor, capital, land, 2 households, enterprises, Government, ROW & ROC
III. Multiplier Decomposition Analysis

- In a market economy, income generation is a process that extends over long chains of expenditure and other income generation.
- Tracing these links gives insight into sources of income and opportunities for poverty reduction.
- In this paper, we apply two techniques to gain these insights, block and path decomposition analysis. Both are covered in the paper, but we present only one here because of time constraints.
Consider a SAM partitioned as follows, with four generic sets of accounts: n-sectors, f-factors, d-domestic institutions, and x-exogenous institutions.

<table>
<thead>
<tr>
<th>T_{nn}</th>
<th>T_{nf}</th>
<th>T_{nd}</th>
<th>T_{nx}</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_{fn}</td>
<td>T_{ff}</td>
<td>T_{fd}</td>
<td>T_{fx}</td>
</tr>
<tr>
<td>T_{dn}</td>
<td>T_{df}</td>
<td>T_{dd}</td>
<td>T_{dx}</td>
</tr>
<tr>
<td>T_{xn}</td>
<td>T_{xf}</td>
<td>T_{xd}</td>
<td>T_{xx}</td>
</tr>
</tbody>
</table>
Using block decomposition techniques from matrix algebra, we can separate the linkage effects across the economy into three generic categories

\[ M = M_3M_2M_1 \]
\[ = N_3 + N_2 + N_1 \]

the component effects can be expressed multiplicatively or additively
\( A_n \) denotes the matrix of average expenditure propensities

\[
A_n = \begin{pmatrix}
A_{11} & 0 & A_{13} \\
A_{21} & 0 & 0 \\
0 & A_{32} & A_{33}
\end{pmatrix}
\]

- total incomes \( y_n \), exogenous injections \( x \).

\[ y_n = A_n y_n + x \]
• M is called accounting multiplier matrix.

\[ y_n = (I - A_n)^{-1} x = M_a x \]

• M is decomposed by three Matrix: intra-group income flows of endogenous accounts, inter-group income flows of endogenous accounts and indirect interaction of all endogenous accounts (Pyatt & Round, 1989).
### Block Decomposition (cont.)

\[
\begin{align*}
M_1 &= \begin{bmatrix}
(I-A_{11})^{-1} & 0 & 0 \\
0 & (I-A_{22})^{-1} & 0 \\
0 & 0 & (I-A_{33})^{-1}
\end{bmatrix} \\
M_2 &= \begin{bmatrix}
I & (I-A_{11})^{-1}A_{12} & (I-A_{11})^{-1}A_{13} \\
(I-A_{22})^{-1}A_{21} & I & (I-A_{22})^{-1}A_{32} \\
(I-A_{33})^{-1}A_{31} & (I-A_{33})^{-1}A_{32} & I
\end{bmatrix} \\
M_3 &= \begin{bmatrix}
I-D_{12}D_{21}-D_{13}D_{31} & D_{21}D_{12} & D_{31}D_{13} \\
D_{12}D_{21} & I-D_{21}D_{12}-D_{23}D_{32} & D_{23}D_{32} \\
D_{13}D_{31} & D_{23}D_{32} & I-D_{31}D_{13}-D_{23}D_{32}
\end{bmatrix}
\]

Note: \(D_{ij} = (I-A_{ij})^{-1}A_{ij}\)
Multiplier Links to Products

<table>
<thead>
<tr>
<th></th>
<th>Crops</th>
<th>Livestock</th>
<th>Othcrop</th>
<th>FoodProc</th>
<th>HHRural</th>
<th>HHUrban</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>21</td>
<td>24</td>
<td>21</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>N3/M</td>
<td>50</td>
<td>30</td>
<td>53</td>
<td>29</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td><strong>Mining</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N3/M</td>
<td>24</td>
<td>39</td>
<td>51</td>
<td>19</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>N3/M</td>
<td>37</td>
<td>42</td>
<td>52</td>
<td>30</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td><strong>Utility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>N3/M</td>
<td>21</td>
<td>38</td>
<td>37</td>
<td>23</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>N3/M</td>
<td>48</td>
<td>62</td>
<td>76</td>
<td>44</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>N3/M</td>
<td>46</td>
<td>49</td>
<td>61</td>
<td>40</td>
<td>17</td>
<td>15</td>
</tr>
</tbody>
</table>

Indirect linkages are very important to agriculture, mainly through marketing channels that have weak net benefits to farmers.

Food processing does not appear to benefit regional farmers, but relies more on imported raw materials.
For farmers, income effects are largest for specialty crops, then livestock, then basic crops. This should position them well for urban income growth.

Indirect benefits are quite weak, again indicating that they are not participating in higher value-added food supply chains.
Rural households in Shanghai appear to get most of their urban income from marketed raw agricultural products.

Again, their participation in food processing chains appears to be very limited.
VII. Conclusions

• Here we briefly present analytical capacity for tracing the complex process of income generation in a market economy.

• Supported by tools like this, poverty reduction strategies can exploit this complexity by attacking poverty from many complementary directions.

• Rather than targeting with direct transfers, policies like facilitation of market access, supply chain development, and others designed can magnify indirect growth effects while promoting a broader basis for development.