Share of Countries over 1/3 Urbanized, by GDP per Capita (2012 $)
1960 and 2010

Source: World Bank
The Urban Triad

The Physical City by rulto

Government battling the Demons of Density

The Economic Magic of Human Interaction by חדוה שנדרוביץ
Urbanization, 2010

Log of P.C. GDP 2010 PPP Fitted values
Per Capita GDP Growth 1960-2010 (Poor Countries<$5000 PC GDP)
Figure 6: Population and income residuals, 2010

USA

Regression: Income = 7.5 + 0.065 + 0.005 * Population R^2 = 0.33

Brazil (urban population only)

Regression: WageRes = -1.43 (0.13) + 0.10 (0.01) UrbanPop. (R-squared = 0.15)

China (urban population only)

Regression: Log Wage Resid PC = -1.59 (0.249) + 0.1 (0.017) Population R^2 = 0.11

India (urban population only)

Regression: Average wage residual in district = -0.11 (0.03) + 0.07 (0.007) UrbanPop. (R-squared = 0.10)
Average Population Growth by Share with BA in 2000 (Quintiles)
Figure 7: University graduates share and wage residuals 2010

**USA**

**Brazil**

**China**

**India**

Source: 2010 US Census and IPUMS N=287
Equation: Value=0.23(0.021)+0.95(0.108)ShareBA2010 R2=0.21

Regression: WageRes=−0.90 (0.02) + 6.62 (0.2) PovBA (R-squared = 0.54).

Source: 2005 Census
Equation: Value=0.22(0.011)+0.75(0.738)ShareBA2010 R2=0.15

Source: 2011-2 India Human Development Survey
Equation: Value=0.39(0.04)+0.57(0.521)ShareBA2011 R2=0.25
Urban-Rural Happiness vs. Log of Per Capita GDP of various countries.
Measuring Streetscapes (with Nikhil Naik)
Measuring Income in the Developing World
Training Examples

$74,000

$38,000

$18,000

Computer Vision

Image Features
Derived from Pixels

Predicted Income

$54,000
Streetscore in the Testing Sample

(b) Performance on the Testing Sample

![Scatter plot showing true log median income against predicted log median income]
Measuring Income in Chile (joint with Sebastian Bustos)

• Chilean Income Data from the Chilean Unemployment Insurance Program
• Latitude/Longitude on home address with Google Streetview
• 160,000 observations with imagery
• R-Squared in Testing Sample of .304
• Lower level of aggregation than NYC (household as opposed to block)
Maybe Aesthetics are a Luxury Good?
(Las Condes– Rich Area)
Middle Income Santiago
Lower Income Santiago
Economic Growth and Firm Size

MSA Employment Growth (1977-2010) by Average Firm Size (1977) Quintiles

Average Percent Growth in Employment, 1977-2010

Smallest firms are in Quintile 1

Average Percent Growth in Employment, 1977-2010

Smallest firms are in Quintile 1
A man transports children through the bustle—and fetid streets—of Mumbai’s Dharavi slum. Conditions like this are similar to those that faced many residents of Paris, London, New York, and other large cities in the nineteenth century.  Prashanth Vishwanathan / Bloomberg / Getty Images
New York City’s Department of Health shows the timeline of the city’s mortality rate, which sharply dropped with the provision of clean water in the nineteenth century.

New York City Department of Health and Mental Hygiene
### Panel A: Non-Bloody Diarrhea

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>All</th>
<th>Under 1</th>
<th>1-5</th>
<th>Over 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Days of Supply Issues</strong></td>
<td>1.00</td>
<td>.32</td>
<td>.42</td>
<td>.27</td>
</tr>
<tr>
<td></td>
<td>(.42)**</td>
<td>(.15)**</td>
<td>(.16)**</td>
<td>(.17)</td>
</tr>
<tr>
<td><strong>Mean of DV</strong></td>
<td>181.9</td>
<td>44.2</td>
<td>71.1</td>
<td>66.6</td>
</tr>
<tr>
<td><strong>1 Std. Deviation Increase Effect</strong></td>
<td>23.7</td>
<td>7.58</td>
<td>9.96</td>
<td>6.40</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
</tr>
</tbody>
</table>

### Panel B: Typhoid Fever

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>All</th>
<th>Under 1</th>
<th>1-5</th>
<th>Over 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Days of Supply Issues</strong></td>
<td>.0020</td>
<td>.00046</td>
<td>.00058</td>
<td>.00093</td>
</tr>
<tr>
<td></td>
<td>(.0010)*</td>
<td>(.00022)**</td>
<td>(.00026)**</td>
<td>(.00080)</td>
</tr>
<tr>
<td><strong>Mean of DV</strong></td>
<td>.209</td>
<td>.007</td>
<td>.057</td>
<td>.145</td>
</tr>
<tr>
<td><strong>1 Std. Deviation Increase Effect</strong></td>
<td>.047</td>
<td>.011</td>
<td>.014</td>
<td>.022</td>
</tr>
</tbody>
</table>
### Panel A: Respiratory Infections

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>All</th>
<th>Under 1</th>
<th>1-5</th>
<th>Over 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days of Supply Issues</td>
<td>2.40</td>
<td>.61</td>
<td>.89</td>
<td>.90</td>
</tr>
<tr>
<td></td>
<td>(.91)**</td>
<td>(.29)**</td>
<td>(.32)**</td>
<td>(.47)*</td>
</tr>
<tr>
<td>Observations</td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
</tr>
<tr>
<td>Mean of DV</td>
<td>461.9</td>
<td>97.8</td>
<td>147.7</td>
<td>216.4</td>
</tr>
<tr>
<td>1 Std. Deviation Increase Effect</td>
<td>56.9</td>
<td>14.5</td>
<td>21.1</td>
<td>21.3</td>
</tr>
<tr>
<td>Observations</td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
<td>1,230</td>
</tr>
</tbody>
</table>

### Panel B: Measles

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>All</th>
<th>Under 1</th>
<th>1-5</th>
<th>Over 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days of Supply Issues</td>
<td>.035</td>
<td>-.00003</td>
<td>.0047</td>
<td>.030</td>
</tr>
<tr>
<td></td>
<td>(.010)**</td>
<td>(.0035)</td>
<td>(.0084)</td>
<td>(.0077)**</td>
</tr>
<tr>
<td>Mean of DV</td>
<td>4.65</td>
<td>.590</td>
<td>2.02</td>
<td>2.04</td>
</tr>
<tr>
<td>1 Std. Deviation Increase Effect</td>
<td>.82</td>
<td>.0071</td>
<td>.11</td>
<td>.71</td>
</tr>
<tr>
<td></td>
<td>(1) Average Consumption</td>
<td>(2) % Metered Connections</td>
<td>(3) Peri-Urban</td>
<td>(4) Population Density</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------</td>
<td>---------------------------</td>
<td>----------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Days of supply issues</td>
<td>-.192</td>
<td>-.416**</td>
<td>.484***</td>
<td>.165</td>
</tr>
<tr>
<td>Days of supply issues</td>
<td>-.060</td>
<td>-.365**</td>
<td>.092</td>
<td>-.146</td>
</tr>
<tr>
<td>(normalized by total connections)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days of Supply Issues</td>
<td>-.046</td>
<td>-.505***</td>
<td>.265*</td>
<td>-.041</td>
</tr>
<tr>
<td>(normalized by account complaints)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction days with at least one supply complaint</td>
<td>-.349**</td>
<td>-.397***</td>
<td>.299*</td>
<td>-.096</td>
</tr>
<tr>
<td>Mean</td>
<td>197.3</td>
<td>.548</td>
<td>.275</td>
<td>7,015</td>
</tr>
</tbody>
</table>
A Tale of Two Technologies

Gautrain by Habib M’henni
Management Failures:
Engel, Fisher, Galetovic in NYC
Incentives and Infrastructure

SECTION OF THE HIGH BRIDGE OVER THE HARLEM RIVER.
Antibiotic Resistant Disease and Proximity to Water in Hyderabad
Public Management Failure: Tweed’s Infamous Courthouse
Political Failures:
Detroit’s Infamous People Mover

Detroit tried to reverse its decline with foolish investments like its People Mover, which here glides over essentially empty streets.

*Dennis MacDonald/ World of Stock*
The Curitiba Innovation

Picture by Mariordo
Engineering vs. Economics: Singapore
Crime: NYC Homicides per 100,000

Figure 9: Homicides in New York City
Ray Kelly vs. Ed Davis: Technology and Community Policing

Ray Kelly by David Shankbone

Ed Davis by Michael Cummo
The Brazil Model: The Dentist and the Supermarket

Supermarket by Wonderlane
The Physical City: NIMBYism vs. Monumentalism

Mumbai has recently begun building up, but the city is still short, expensive, and congested because of decades of overrestricting height.  

Astana by ChelseaFunNumberOne -
The Boston Hypothesis: Democracy, Urbanization and Inclusion