Territorial disparity in Ecuador through the structural gaps approach

Ramiro Canelos Salazar
Montserrat Pallares-Barbera
Ana Vera
ramiro.canelos@e-campus.uab.cat
CONTENTS

1. Objectives
2. Conceptual framework
3. Methodology
4. Results
5. Conclusions
1. Objectives

- To analyze how the structural heterogeneity in the cities of Ecuador affects the inequalities of population.
- To propose a methodology based on the structural gaps approach to identify the level development in the cities of Ecuador (Taxonomy).
2. Conceptual Framework

The conceptual framework is based on structural heterogeneity:

• Internal gap - marked differences in productivity among sectors and within each one.

• External gap – disparities in technological capabilities with respect to other more technological developed countries.

• Employment: 60% of active population is considered working in informal economy, while the rest of employment concentration in activities of low productivity.

• The size of enterprises affects productivity (micro and small 98%).

• Growth based on natural resources. Low export diversification

• Spatial concentration of economic and social disparities and persistence of territorial inequalities

(Candia, 2015); (Cimoli, Porcile, 2013); (Mattar, 2011); (CEPAL, 2016, 2010) (Rodríguez, 2006); (Cimoli, 2005). (Pinto, 1970)
3. Objectives of the Methodology

- It aims to capture a multifaceted reality and articulate an expanded vision of development (Kaldewei, 2015; Pardo, 2014).
- GDP per capita is not the only indicator to reflect the level of national development of countries (Ecuador is a middle income country).
- It seeks to identify and prioritize the main obstacles (structural breaches) and their determinants that obstruct development processes. (Titelman, Vera and Pérez-Caldentey, 2012; Pardo, 2014; and, Kaldewei, 2015).
- Overall, these gaps reflect the specific developmental lags of a country or sub-region in its many aspects, and the size and importance of each gap varies from city to city (Kaldewei, 2015).
3. METHODOLOGY

Figure 1
DEVELOPMENTAL DIAGNOSTICS FROM STRUCTURAL GAPS

Lack of sustainable and inclusive development

- Low Income by inhabitant
- Low level of savings and investment
- Low Productivity and innovation
- Insufficient Infrastructure
- Fiscal issues

Deep Inequality

- High rates of Poverty
- Limited public health services
- Environmental impact
- Poor quality in education
- Gender inequality

<table>
<thead>
<tr>
<th>Gap</th>
<th>Indicator use as proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inequality</td>
<td>GINI INDEX INEC-BID 2014</td>
</tr>
<tr>
<td>Poverty</td>
<td>Rate of poverty INEC-BID 2014</td>
</tr>
<tr>
<td>Health</td>
<td>Health Percentage of adolescent mothers INEC 2010</td>
</tr>
<tr>
<td>Gender</td>
<td>Female Population affiliated to Social Security INEC 2010</td>
</tr>
<tr>
<td>Environment</td>
<td>Homes use firewood for cooking INEC 2010</td>
</tr>
<tr>
<td>Education</td>
<td>Net attendance rate Higher Education INEC 2010</td>
</tr>
<tr>
<td>Investment and saving</td>
<td>Investment and saving Per capita credit volume S.Bancos 2010-2015</td>
</tr>
<tr>
<td>Productivity and Innovation</td>
<td>Homes with Internet availability INEC 2010</td>
</tr>
<tr>
<td></td>
<td>Sales Companies by affiliated worker social security INEC (2010-2014)</td>
</tr>
<tr>
<td></td>
<td>Population Affiliated to social security INEC 2010</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Households living in inadequate housing INEC 2010</td>
</tr>
<tr>
<td></td>
<td>Per cápita Collection taxes SRI 2010-2015</td>
</tr>
</tbody>
</table>

Sources: Instituto de Estadísticas y Censos. Servicios de Rentas Internas, Superintendencias de Bancos, Ministerio de Finanzas.
3. Methodology

1. Using the analysis of Hierarchical Clustering: Classify cities into a number of groups, each of them is internally homogeneous.

2. Define the method of selecting elements (variables). In this case, the Ward’s method is used: Defines an overall measure of the heterogeneity of a cluster of observations in groups. This measure \( W \) is the sum of squared euclidean distances between each element and the mean of its group.

3. The variables get standardized (they are all continuous).

4. Analysis of variance of a factor lets to identify those variables which aren’t statistically significant (ANOVA).

5. Measures of association: identify the discriminant variables which are specially associated to the created clusters, so, they become relevant in the construction of groups.

6. Analysis of means: In order to characterize the clusters.
4. Results

• 5 Clusters

Table 2. ANOVA - Measures Association

<table>
<thead>
<tr>
<th>Variables</th>
<th>ANOVA</th>
<th>Measure association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homes with Internet availability INEC 2010</td>
<td>103,145</td>
<td>,000 ,811 ,657</td>
</tr>
<tr>
<td>Net attendance rate Higher Education INEC 2010</td>
<td>81,906</td>
<td>,000 ,777 ,604</td>
</tr>
<tr>
<td>Per cápita Collection taxes SRI 2010-2015</td>
<td>70,123</td>
<td>,000 ,752 ,566</td>
</tr>
<tr>
<td>GDP Per cápita average BCE (2007,2013,2014)</td>
<td>69,802</td>
<td>,000 ,752 ,565</td>
</tr>
<tr>
<td>Rate of poverty INEC-BID 2014</td>
<td>69,111</td>
<td>,000 ,750 ,563</td>
</tr>
<tr>
<td>Population Affiliated to social security INEC 2010</td>
<td>63,843</td>
<td>,000 ,737 ,543</td>
</tr>
<tr>
<td>Investment and saving Per capita credit volume S.Bancos 2010-2015</td>
<td>61,115</td>
<td>,000 ,729 ,532</td>
</tr>
<tr>
<td>Female Population affiliated to Social Security INEC 2010</td>
<td>60,342</td>
<td>,000 ,727 ,529</td>
</tr>
</tbody>
</table>
Cluster 1
Development level higher than national average.

- 5 cities (36% hab.)
- GDP - 2014 is $9.389
- Growth Rate 13.5%
- Manufacturing sector accounts for 17% of total GDP

Predominant sector and activities: professional, financial, trade and manufacturing
Figure 3

Ecuador. Taxonomy by level of development of cities

Cluster 5
Level of High Medium Development.

- 20 cities (17% hab)
- GDP 2014 $7.440
- Growth rate 8.9%
- Manufacturing sector 12.3%

Predominates Agriculture, Manufacturing, Construction and Trade.
Figure 4

Ecuador. Taxonomy by level of development of cities

Cluster 2.
Level of development similar to the national average.
- 122 cities (35% hab)
- GDP 2014 $2.927
- Growth rate. 5.1%
- Manufacturing sector 4.3%

Predominant activities: agriculture, public administration, Education.
Figure 5

Ecuador. Taxonomy by level of development of cities

Cluster 4.
Level of development below the national average

- 41 cities (6% hab)
- GDP 2014 $1.798
- Growth Rate. 2.5%
- Manufacturing sector 2%

Predominates Agriculture, Public administration, Education.
Figure 6

Ecuador. Taxonomy by level of development of cities

Cluster 3.
Lowest Development Level compared to national average

- 32 cities (6% h)
- GDP 2014 $1.700
- Growth Rate. 3.8%
- Manufacturing sector 1%

Predominates Agriculture, Public administration, Education.
Figure 7. GDP per capita and annual GDP growth rate 2007-2014 by clusters (dollars)
Figura 8. Productivity firms for clusters
Sales (dollars) /Wages (dollars). Average for year (2010-2014)

Source: DIIE -2015
Figure 9. Percentage of companies by sector and clusters

Cluster 1: Agriculture, livestock and fishing 36.0% 48.2%
Cluster 2: Exploitation of Mines and Quarries 23.0% 30.9%
Cluster 3: Manufacturing industry 39.0% 23.9%
Cluster 4: Trade 39.2% 23.3%
Cluster 5: Construction 41.0% 4.1%

Services 7.6% 28.3% 28.9% 2.9% 36.9% 4.6% 48.2%
Figure 10. Poverty index, net enrollment in higher education, and households with Internet access by clusters
5. Conclusions

**Level and evolution of disparities**

- Concentration and persistence: Disparities of GDP per capita in Clusters are very considerable.

- The growth rates of their economies (2007-2014) show clear trends of growth and stagnation, deepening an uneven development.

- Significant differences in other gaps among clusters. Social and economic conditions, (education, health, technology access, credit, collection, sales, etc.) reinforce disparities. Territories have weak capacity for development.
5. Conclusions

**Structural heterogeneity.**

- It is reflected in the differences in the sectoral composition of production among clusters
- Firms heterogeneity and weak structure (98% micro and small).
  - Occupy more unskilled labor
  - Unlikely to incorporate technology and innovation
  - The clusters 2, 3 and 4 (85% cities - 50% h.), focus on primary activities ("Agriculture, Livestock and Fisheries") and trade.
AAG Annual meeting - Boston
Urban Economies and the Ordinary Life B: Economy of Cities II

Thanks

Ramiro Canelos Salazar
Montserrat Pallares-Barbera
Ana Vera
ramiro.canelos@e-campus.uab.cat

Friday, 7 abril 2017
Structure firms of Ecuador

- Large. Sales US$5’000.001 year o +. Workers 200 o +;
- Middle B. Sales US$2’000.001 a $5’000.000. Workers 100 to 199;
- Middle A. Sales US$1’000.001 a $2’000.000. Workers 50 to 99;
- Small. Sales $US100.001 a $1´000.000. Workers 10 to 49
- Micro enterprises. Sales 0 a US$100.000. Workers 1 to 9

INEC 2015.
Cluster 1 have 70% of Large firms, 14% in C2; 14.5% in C5; 1% in C4 and 1.2% in C3. INEC 2015.

<table>
<thead>
<tr>
<th>Enterprises characteristics</th>
<th>LARGE</th>
<th>MICRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALES</td>
<td>73.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>WORKERS (Social Security)</td>
<td>50.0%</td>
<td>5.4%</td>
</tr>
<tr>
<td>WAGES</td>
<td>61.0%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>