Determinants of Economic Growth: The Case of Guatemala

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FADEP
Guatemala, Guatemala
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Purpose of the Study

- To understand the relevance of population and family to the economic growth process in Guatemala.

- To investigate how the family engages in the process of economic growth.

- To empirically identify what model of economic growth best fits the Guatemalan reality.

- To facilitate and strengthen the present and future population and family policy design and implementation in Guatemala.
Data Used and Framework

- Three databases

- Framework
  - Test of Economic Growth Theory
  - Other explanatory variables have been added as fitting.
  - Analysis of Family Dynamics on wealth, income and human capital.
There is a *positive correlation* between
- human capital, infrastructure and economic growth
- healthy institutions and economic development
- health and income per capita

These positive correlations reflect an *essential causal link* running from human capital to
- healthy institutions (social capital)
- infrastructure and technology

Life expectancy is a *significant predictor* of economic growth
<table>
<thead>
<tr>
<th>Basic Activities</th>
<th>Means Used</th>
<th>Role of the Family</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>Resources</td>
<td>Human Capital</td>
<td>Basic Needs</td>
</tr>
<tr>
<td>Exchange</td>
<td>Market</td>
<td>Human, Moral, Social Capital</td>
<td>Profit</td>
</tr>
<tr>
<td>Consumption</td>
<td>Optimization and Distribution</td>
<td>Appropriate distribution</td>
<td>Wellbeing (welfare)</td>
</tr>
</tbody>
</table>
Economic Theories of Growth

- Neo-Classical Theory
  - Embraces Malthus’s inverse relationship between population growth and real growth but acknowledges the key role of investment and thus savings in the process of growth.

- Human Capital Theory
  - Human capital is an important source of economic development that depends on advances in technological and scientific knowledge. Increasing returns to scale.

- Malthusian
  - Inverse Relationship between population and consumption.

- Neo-Malthusian Theory: Ehrlich and Hardin
  - Population depletes resources and damages the environment.
# Environmental Health, Welfare and Living Conditions in Guatemala, 2004

<table>
<thead>
<tr>
<th>Indicator</th>
<th>% access</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Connection: water</td>
<td>89/99</td>
</tr>
<tr>
<td>House Connection: sewerage</td>
<td>59/99</td>
</tr>
<tr>
<td>House Connection: electricity (rural-urban)</td>
<td>50-62 / 100</td>
</tr>
<tr>
<td>Water consumption (liter per person)</td>
<td>50/100 / 600</td>
</tr>
<tr>
<td>Improved Water (urban-rural)</td>
<td>88/98 / 100</td>
</tr>
<tr>
<td>Improved Sanitation</td>
<td>90/100</td>
</tr>
<tr>
<td>Access to Basic Essential Drugs</td>
<td>85-90/91</td>
</tr>
<tr>
<td>Immunization</td>
<td>92/100</td>
</tr>
<tr>
<td>Under-five mortality (per 1000)</td>
<td>49/6</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>65/85</td>
</tr>
<tr>
<td>Public Expenditures on Health (%GDP)</td>
<td>5.7 / 6.2</td>
</tr>
<tr>
<td>Paved Roads</td>
<td>87/94</td>
</tr>
<tr>
<td>Telephones Mainlines (per 1000)</td>
<td>77/597</td>
</tr>
<tr>
<td>Cellular Subscribers (Per 1000)</td>
<td>165/605</td>
</tr>
<tr>
<td>Literacy</td>
<td>69.1/100</td>
</tr>
</tbody>
</table>

Sources: [Human Development Report, 2005](#) and [Millennium Development Goal Indicators, 2005](#).
## Leading Causes of Death and Health Services in Guatemala

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate (per 100 000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Non-communicable diseases</td>
<td>562.0</td>
</tr>
<tr>
<td>Maternal mortality ratio</td>
<td>240</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>188.0</td>
</tr>
<tr>
<td>Non-communicable diseases other than cardiovascular, injuries and cancer</td>
<td>183</td>
</tr>
<tr>
<td>Injuries</td>
<td>98.0</td>
</tr>
<tr>
<td>Cancer</td>
<td>93.0</td>
</tr>
<tr>
<td>HIV/AIDS (825 infected and 77.8 new cases every year)</td>
<td>21</td>
</tr>
<tr>
<td>Tuberculosis (109 infected)</td>
<td>13.1</td>
</tr>
<tr>
<td><strong>Children (% of death among children)</strong></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Neonatal causes rate</td>
<td>37.3</td>
</tr>
<tr>
<td>Other causes rate</td>
<td>29.8</td>
</tr>
<tr>
<td><strong>(54.2% of children are undernourished in rural areas. 32% in urban areas.)</strong></td>
<td></td>
</tr>
<tr>
<td>Pneumonia rate</td>
<td>15.0</td>
</tr>
<tr>
<td>Diarrhea diseases rate (58% access <strong>dehydration therapy</strong>)</td>
<td>13.1</td>
</tr>
<tr>
<td>Injuries rate</td>
<td>1.5</td>
</tr>
<tr>
<td>Malaria rate</td>
<td>0.4</td>
</tr>
<tr>
<td>Measles rate</td>
<td>0.1</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Services</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal care coverage - at least one visit</td>
<td>86</td>
</tr>
<tr>
<td>Antenatal care coverage - at least four visits (%)</td>
<td>68</td>
</tr>
<tr>
<td>Births attended by skilled health personnel (rural/urban)</td>
<td>25/66.1</td>
</tr>
<tr>
<td>Contraceptive prevalence rate</td>
<td>43.3</td>
</tr>
<tr>
<td>Hospital beds (per 10 000 population)</td>
<td>7.0</td>
</tr>
</tbody>
</table>
Poor health is highly correlated with low levels of education and poverty.

**Graph:**
- **Prevalence of Child Death (%):**
  - Lowest wealth quintile: 65.3%
  - Highest wealth quintile: 7.5%
  - Lowest education level: 64.4%
  - Highest education level: 12%

**Sources:** Care Health Indicators for Guatemala

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Families face serious health and poverty problems

• Lack of income and assets to attain basic needs:
  ✓ Human assets
  ✓ Natural assets
  ✓ Physical assets
  ✓ Financial assets
  ✓ Social assets
  ✓ Aging security

• Vulnerability to adverse shocks are linked to an inability to cope with them
1. Aggregated Level: Models

• The openness of the economy: +

• The Neo-Classical model seems to perform best.
  
  – Investment and Technology: +
  – Population Growth: 0
  – Domestic Research and Development: +
  – Foreign Research and Development: 0
  – Foreign Technology: +
Formal and Total Real GDP 1950-2006

Population and GDP Per Capita
1950-2006

- **Total Population (Millions)**
- **Real GDP per Capita**

- **Years**
  - 1950
  - 1951
  - 1952
  - 1953
  - 1954
  - 1955
  - 1956
  - 1957
  - 1958
  - 1959
  - 1960
  - 1961
  - 1962
  - 1963
  - 1964
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  - 1993
  - 1994
  - 1995
  - 1996
  - 1997
  - 1998
  - 1999
  - 2000
  - 2001
  - 2002
  - 2003
  - 2004
  - 2005
  - 2006
Speed of Population Aging

Number of years for % of population aged 65 and over to rise from 7% to 14%

<table>
<thead>
<tr>
<th>Country</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colombia</td>
<td>20</td>
</tr>
<tr>
<td>Brazil</td>
<td>21</td>
</tr>
<tr>
<td>Thailand</td>
<td>22</td>
</tr>
<tr>
<td>Tunisia</td>
<td>23</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>23</td>
</tr>
<tr>
<td>Jamaica</td>
<td>24</td>
</tr>
<tr>
<td>Chile</td>
<td>25</td>
</tr>
<tr>
<td>Singapore</td>
<td>27</td>
</tr>
<tr>
<td>China</td>
<td>27</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>41</td>
</tr>
<tr>
<td>Japan</td>
<td>26</td>
</tr>
<tr>
<td>Spain</td>
<td>45</td>
</tr>
<tr>
<td>United</td>
<td>45</td>
</tr>
<tr>
<td>Poland</td>
<td>47</td>
</tr>
<tr>
<td>Hungary</td>
<td>53</td>
</tr>
<tr>
<td>Canada</td>
<td>65</td>
</tr>
<tr>
<td>United States</td>
<td>69</td>
</tr>
<tr>
<td>Australia</td>
<td>73</td>
</tr>
<tr>
<td>Sweden</td>
<td>85</td>
</tr>
<tr>
<td>France</td>
<td>115</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, 2000
Speed of Aging Population 1982-2006

Sources: Raw data obtained from INE.
Estimation of Gross Domestic Product *Per Capita* Under Various Assumptions

(Base year: 2006)

**Sources:**

GDPPC59 was estimated based on the current trend of aging population acceleration.
GDPPC74 captures the *per capita* GDP path for the present population structure.
GDPPCCT captures the *per capita* GDP path for a 2% population growth.

Sources: ENEI, 2004
Income Composite or NBI Distribution for Head of Households, 2004

• **Accentuated disparity in both income and wealth distribution**
  - Access to credit: +
  - Years of education: +
  - Remittances: +
  - *Per capita* income: + **on Inequality**
  - Openness of the economy: + **on Inequality**
  - Political Stability/Rule of Law: +

• **Human Capital**
  - Education (measured as average years of education): 0
  - Experience and stock of capital: +
  - Increasing returns to scale on human capital: +
  - Average years of education: 3
  - Inefficiencies found in the social return of education.
Marginal Benefit and Cost of Schooling, 1950-2006

Sources: Own Econometric Estimation
In Summary
The Empirical Evidence

- Supports openness in the economy.
- Emphasizes the importance of investment and technology as well as education for growth.
- Indicates increasing returns to scale to human capital.
- Lends no support for policies directed towards population control.
III. Disaggregated Level Wealth
Household Characteristics
Contribution to Wealth (% Increase/Decrease)

Sources: Own Econometric Estimation
Contribution of Marriage to Wealth (% Increase)

Sources: Own Econometric Estimation

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Percentage of Head of Households that Report Owning Property and Holding Savings

Remittances

• The probability of receiving remittances increases by 18.6% when it is headed by married women.

• In other type of family structures it decreases by 2.7%.
III. Disaggregated Level: NBI
Household Characteristics

Contribution to Income (NBI)

(% Increase/Decrease)

<table>
<thead>
<tr>
<th>Household Characteristic</th>
<th>Number of times that Increases/Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>0.6</td>
</tr>
<tr>
<td>Higher level of education</td>
<td>1.2</td>
</tr>
<tr>
<td>Urban vs. rural</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Level of Income (NBI) and Wealth of the Head of Household by Family Structure

<table>
<thead>
<tr>
<th></th>
<th>MARRIED</th>
<th>NOT MARRIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBI</td>
<td>8.95</td>
<td>13.84</td>
</tr>
<tr>
<td>WEALTH</td>
<td>5.51</td>
<td>5.48</td>
</tr>
</tbody>
</table>

Average Wealth and Income Composite per Family Structure and Race

**Sources:** ENEI (2004)

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Impact of Marriage by Race

The diagram illustrates the percentage increase in wealth and income for Ladino and Indigenous married individuals. The y-axis represents the percentage increase, ranging from 0 to 80. The x-axis is divided into two categories: Wealth and Income. For Wealth, the percentage increase is 26 for Ladino and 22 for Indigenous. For Income, the percentage increase is 69 for Ladino and 70 for Indigenous.
Family Structure by Race

Sources: ENEI (2004)
Human Capital

• Educational levels are affected by family structure.

• Attendance to school is higher among married households than others.

• It is also reinforced by remittances.
Factors Affecting Child Schools Attendance

- Race: Indigenous
- Parents Education
- Income
- Wealth
- Area
- Marriage

Percentage Increase

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Level of Education of the Head of Household per Race and Family Structure

Sources: ENEI (2004)
Children School Attendance by Family Structure

Sources: ENEI (2004)
Why is family structure information relevant?

- Increase savings, and these are needed for investment
- Decreases poverty and there is a large portion of the population who live in poverty
- Access to wealth facilitates social mobility
- Relevant for the determination of human capital
- Broken families are a burden on public finances
- For policy design purposes
IV. Policy Recommendations

• Continue to deepen the opening of the economy while reinforce institutions at both national and local levels.
  – Rule of law
  – Transparency
  – Property rights
  – Education system
  – Strengthening of the family structure should be priority.
• Expand access to economic opportunity for low income households.

• Promote legislation that supports families vis a vis other types of living styles.

• Promotion and protect healthy families as a means to eradicate poverty, especially the feminization of poverty.
• Reform the public and private education system in Guatemala to improve the coverage and quality of educational services.

• The government can assist lower income families to choose among these alternatives through a voucher system or another demand-oriented financial mechanism.
• Improve efficiency in the use of government funds now allocated to population

• Redirect the present efforts towards population control and sexual education programs
• Develop labor legislation that facilitates and provides incentives for the harmonization of family life and professional activity for all family members.
Conclusions

• Economic Development is an outcome of more than economic processes.

• It is an outcome of economic, social, and political processes.

• To attain it, opportunities need to be promoted, empowerment at all levels facilitated, and stability ensured.
Conclusions

• Neo-Classical Model is supported in Guatemala.

• The openness of the economy has been positive for economic growth.

• Experience rather than education is significant for economic growth.

• There is evidence for lack of efficiency in the education system.

• Rate of growth of population is not significant for economic growth. Fertility rate is significant and positive.

• Family structure is relevant for wealth. This happens to be the case after other characteristics are controlled by.