WILLIAMSON-KUZNETS' HYPOTHESIS:
SOME EVIDENCE FROM TURKISH PROVINCIAL DATA

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1. Introduction

In a seminal paper, Kuznets (1955) [1] suggests that personal income inequality increases in the course of development and decreases in the latter stages of development. Williamson (1965) [2] applied this hypothesis on spatial level by investigating regional inequalities in developed and developing countries. According to Williamson's results, regional inequalities increase in the early stages of development but follow a decreasing trend in the latter stages of development depending on adjustment speeds of labour and capital.

Regional imbalances in economic development process have been also discussed by other authors as Myrdal and Hirschman. On the essence of Perroux unbalanced development process on spatial level, regional inequality stemmed from backwash effects (termed by Myrdal) or polarization effects (termed by Hirschman) will increase when development process begun. But spread effects or trickledown effects will reduce these inequalities duration of development. Williamson has gathered these effects (1965) [2].

Several authors have tested Williamson-Kuznets' hypothesis on regional level using different methodologies (Amos, 1988 [3]; Fan and Casetti, 1994 [4]; Das and Barau, 1996 [5]). In general, results obtained from developed countries (e.g., United States) indicate a cyclical trend in regional inequality, while results related to developing countries (e.g. India) are not unclear. As a developing country Turkey is an example for economic development and regional inequality in the context of inverted-U relationship. Regional disparities have widened accompanied with industrialization progress in the 1960s and the 1980s, but started to decline with development and liberal policies in the 1990s.

2. Data and Methodology

The analysis was conducted by considering 67 provinces of Turkey. Gross domestic product by provinces in current prices was obtained from Çiller (1980) [6] for the 1965-1975 period, Özütün (1980, 1988) [7] for the 1975-1986 period, and Turkish Statistics Institute for the 1987-2001 period. Domestic product data by provinces were smoothed using national price index (1995=100) because there was not price index on provincial level especially back dates. Population of provinces was interpolated from official census in 1965, 1970, 1975, 1980, 1985, 1990, and 2000.

Coefficient of Variation (CV) introduced by Williamson (1965) [2] was used to measure regional income inequality. National per capita income in 1963 constant prices was considered as a level of economic development indicator. Afterwards, quadratic regression models were used to test Inverted-U Hypothesis. Estimated equations are as follows:

Quadratic

$$CV_t = \alpha_1 + \alpha_2 PC_t + \alpha_3 PC_t^2 + u_t \qquad \text{(Eq. 1)}$$

Semi-log Quadratic

$$CV_t = \beta_1 + \beta_2 \log PC_t + \beta_3 (\log PC_t)^2 + u_t \quad \text{(Eq. 2)}$$

Where, CV_t is index value for regional inequality in t year, and PC_t is real national income per capita in t year. Estimation of Eq.1 or Eq. 2 provides support for Williamson-Kuznets' approach if α_2, $\beta_2 > 0$ and α_3, $\beta_3 < 0$.

3. Empirical Results

Regional inequality measured by CV for each year was denoted on vertical line in Fig. 1, and

logarithm of real national per capita income was shown on horizontal line in Fig. 1. Regional inequality and economic development pointed out an inverted-U relationship as Williamson suggested, which can be seen in the Fig. 1.

Figure 1: Economic Development and Regional Inequality in Turkey, 1965-2001.
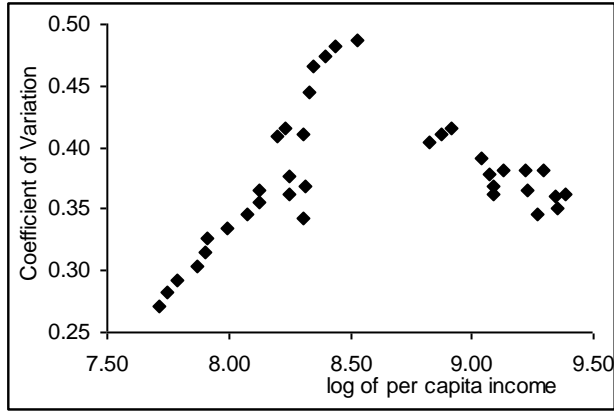
In the Fig. 1, regional inequality measured by CV has gradually increased until 8.6 (approximately per capita 1462 \$), which can be seen a turning point or a threshold, but started to decrease when national per capita income exceeds this point. The relation demonstrated in the Fig. 1 can be estimated using Eq. 1 and Eq. 2.

Table 1: Estimation Results
Dependent Variable: Coefficient of Variation

Equations	α_2	α_3	Adjusted R^2
Quadratic*	0.0721 (5.4021)**	-0.0051 (-5.1663)	0.4350
	β_2	β_3	Adjusted R^2
Semi-log Quadratic	3.7633 (8.9325)	-0.2168 (-8.7913)	0.7310

* National per capita income in constant prices has divided by 1,000 for representation.
** t value in parentheses, and all coefficients are statistically significant at 1%.

The results in Table 1 indicate that there is a significant inverted-U relationship between national per capita income used as a proxy for level of economic development and CV used as a proxy of regional income inequality. Both α_2, β_2 and α_3, β_3 are statistically significant at 1% and have positive and negative signs, respectively.

4. Concluding Remarks

These results indicate that regional inequality decreases the latter stages of economic development in Turkey. Changes in regional inequalities associated with economic development have represented an inverted-U shape as Williamson argued. But it is a finite issue because the analysis period is insufficient to reach a general conclusion. Furthermore, development progress, regional inequality and industrialization concepts can be defined in various forms and examined with different variables.

References

1. Kuznets, S. (1955), "Economic Growth and Income Inequality", *American Economic Review*, 45, 1-28.

2. Williamson, J.G. (1965), "Regional Inequality and the Process of National Development: A Description of Pattern", *Economic Development and Cultural Change*, 13(4), s. 3-45.

3. Amos, O. M. (1988), "Unbalanced Regional Growth and Regional Income Inequality in the Latter Stages of Development", *Regional Science and Urban Economics*, 18, 549-566.

4. Fan, C.C. and E. Casetti (1994), "The Spatial and Temporal Dynamics of US Regional Income Inequality, 1950-1989", *Annals of Regional Science*, 28, 177-196.

5. Das, S. K. and A. Barua (1996), "Regional Inequalities, Economic Growth and Liberalisation: A Study of the Indian Economy", *Journal of Development Studies*, 32(3), s64-398.

6. Çiller, T. (1982), *Distribution of National Income on Provincial Level* (In Turkish*)*. Bogazici University, Administrative Sciences Faculty, Istanbul, Turkey.

7. Özütün, E. (1980), *Turkey's Gross Domestic Product by Provinces* (In Turkish), State Institute of Statistics, Ankara, Turkey; (1988), *Distribution of Turkey's Gross Domestic Product by Provinces 1979-1986.* Istanbul Chamber of Industry, Istanbul, Turkey.

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