

Life Quality, Recession Remedy and Energy Strategy

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Content

- The Medicine of Economics: Government is the Medical Doctor for the Economy
- Recession as Economic Illness: Two Oil Shocks
- Life Quality: Multivariate Cross-Country Study
- Energy Strategy as Recession Remedy
- Power Market Design Flaws and Improvement

Basic Concepts of the Medicine of Economics

- The major goals of medicine of economics are diagnostics, prophylactics, and treatment of economic diseases such as recession, inflation, stagflation, unemployment, or poverty.
- The diagnostics component is necessary for understanding the conditions of economics and forecasting its future development.
- The prophylactic component supports sustainable economic growth and protects healthy economies from diseases.
- Treatment operates on economic diseases to return the economy to its initial conditions or to improve them. Possible treatments include shock therapy, import substitution, and export promotion.

FIGURE 1. World Economies' Illnesses and Recoveries from 1962 to 1993

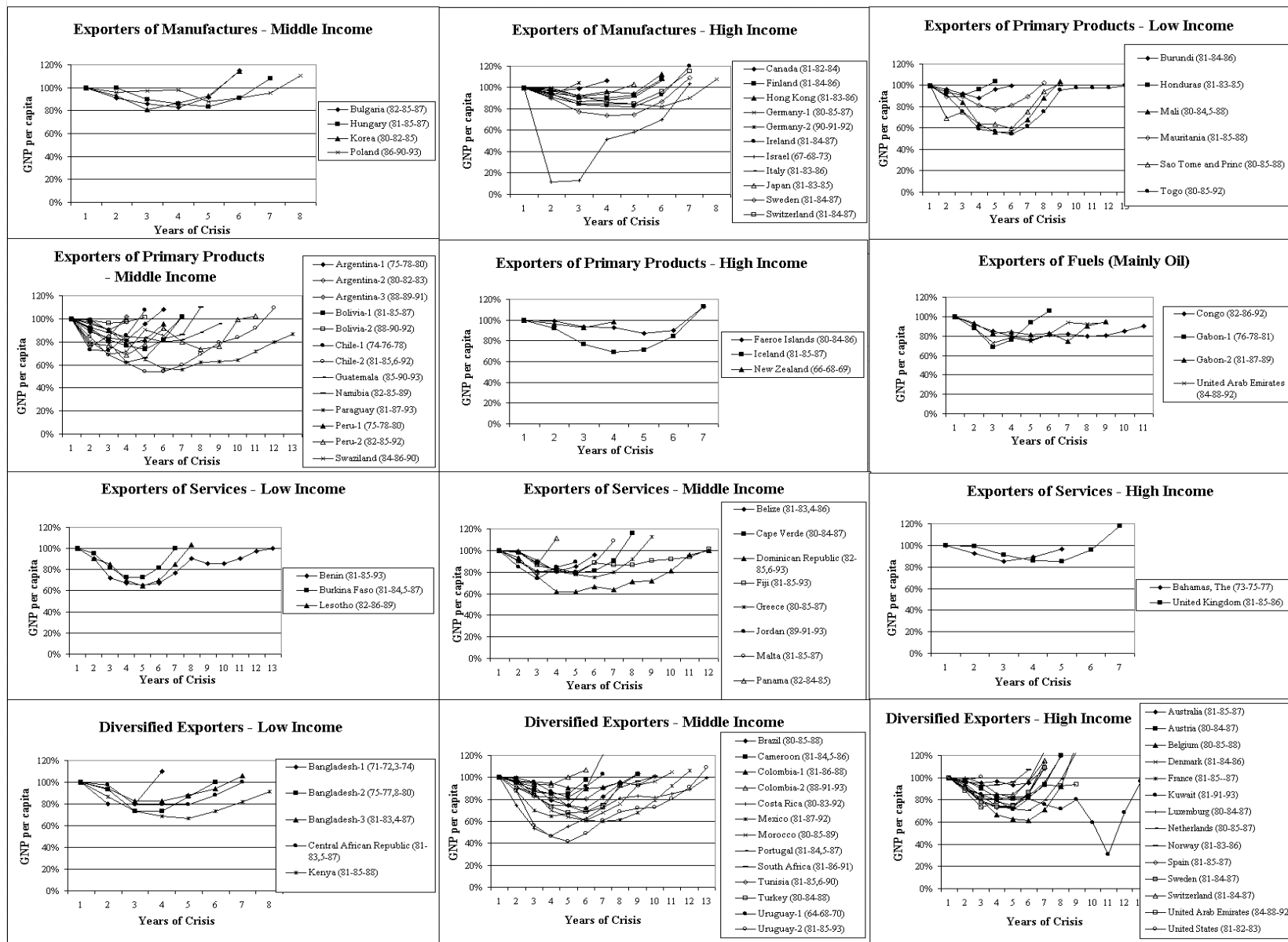


FIGURE 2. Regression Control Chart for DEPTH Vs LENGTH of Crisis

Regression Equation: $DEPTH = .98841 + -.0356 * LENGTH$

Correlation: $-.62757$ N = 83 Std. Err. of Est.: $.1134301$

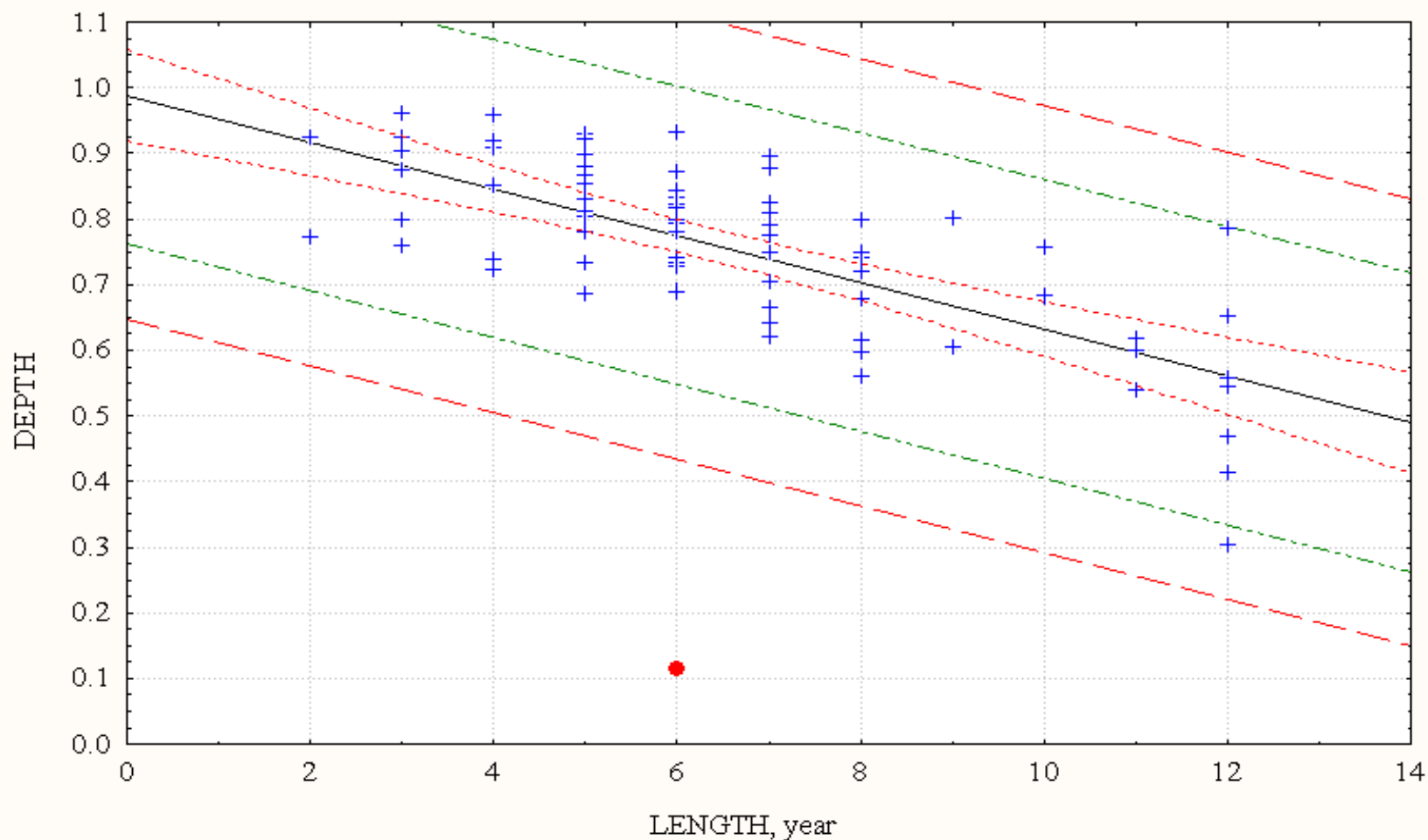


FIGURE 3. Average Depth Vs Length of Crisis

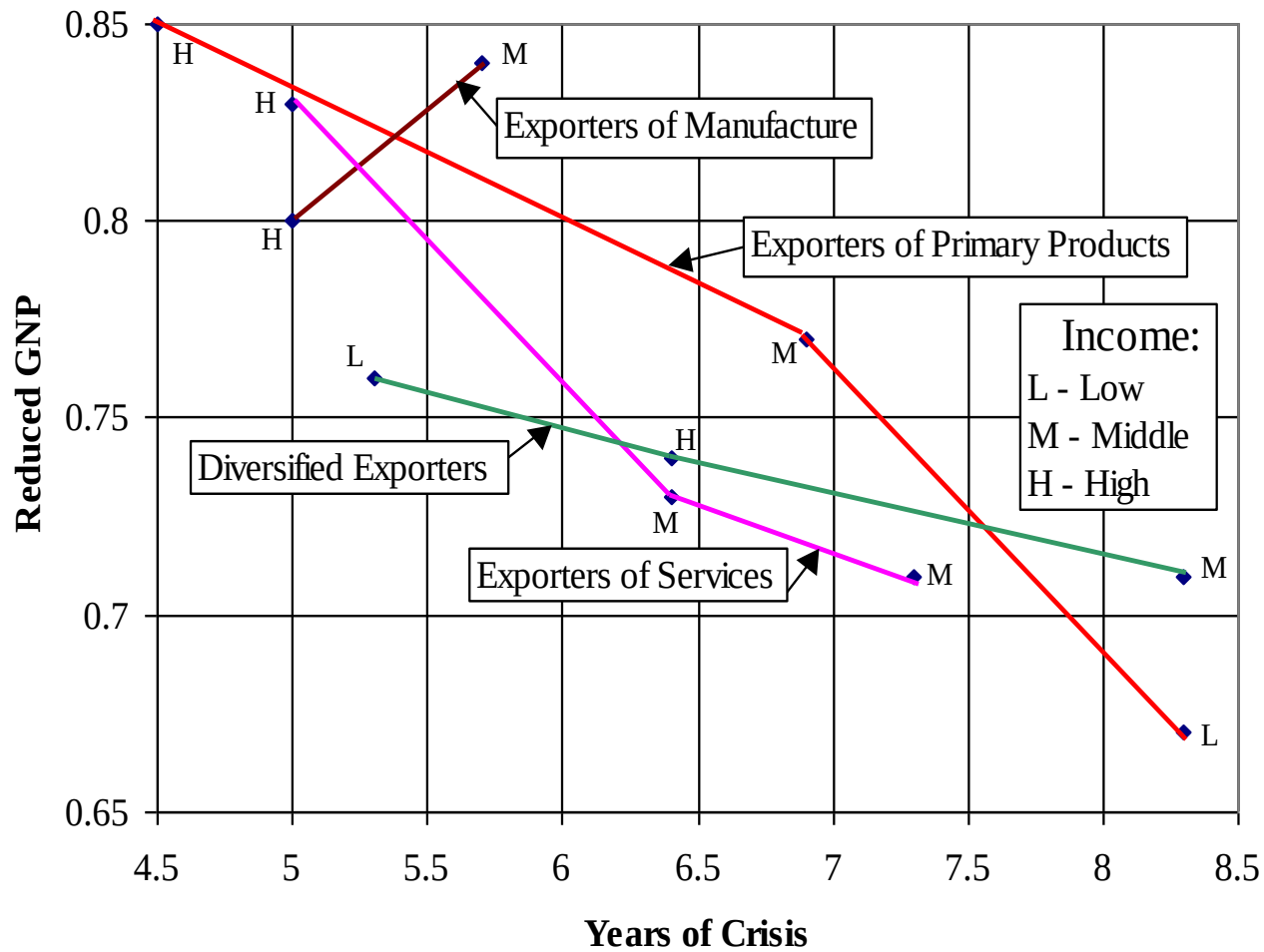


FIGURE 4
OPEC GDP for 1960-1993
 in billions of current US\$

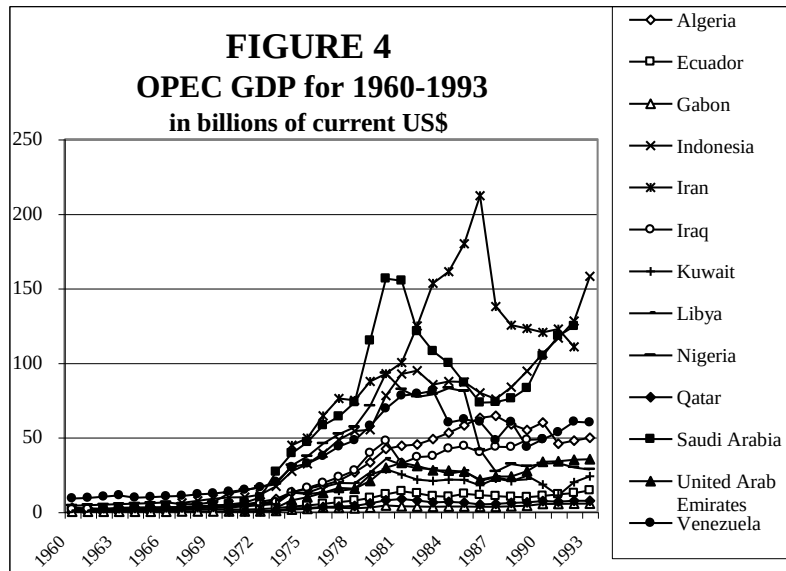


FIGURE 5
GDP for 1960-1993
 in trillions of current US\$

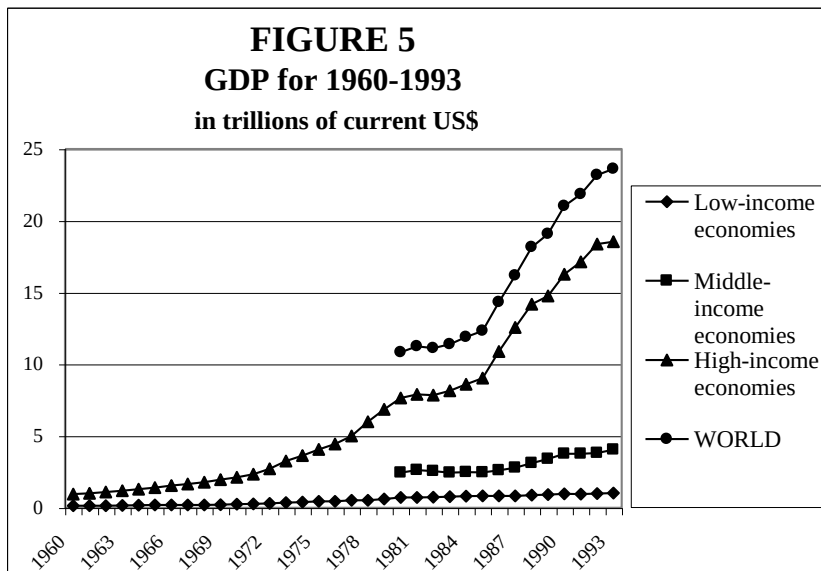


FIGURE 6
OPEC GNP per capita for 1960-1993
 in current US\$

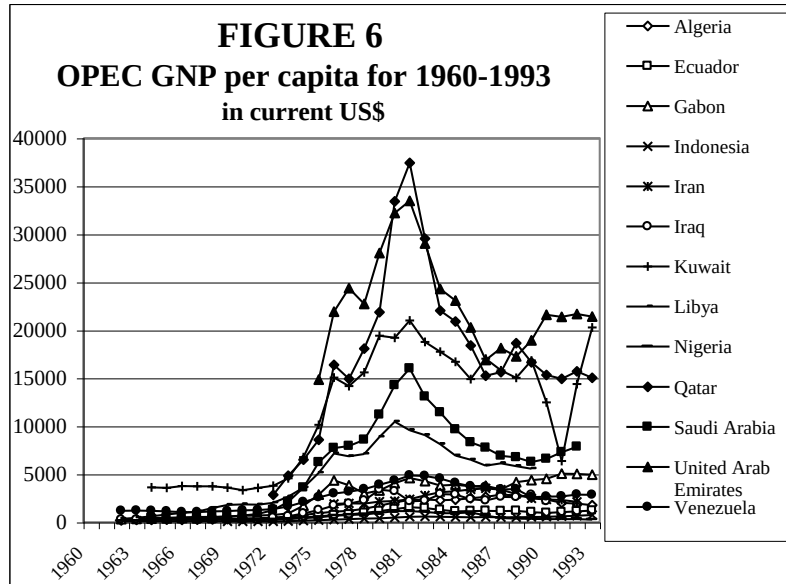
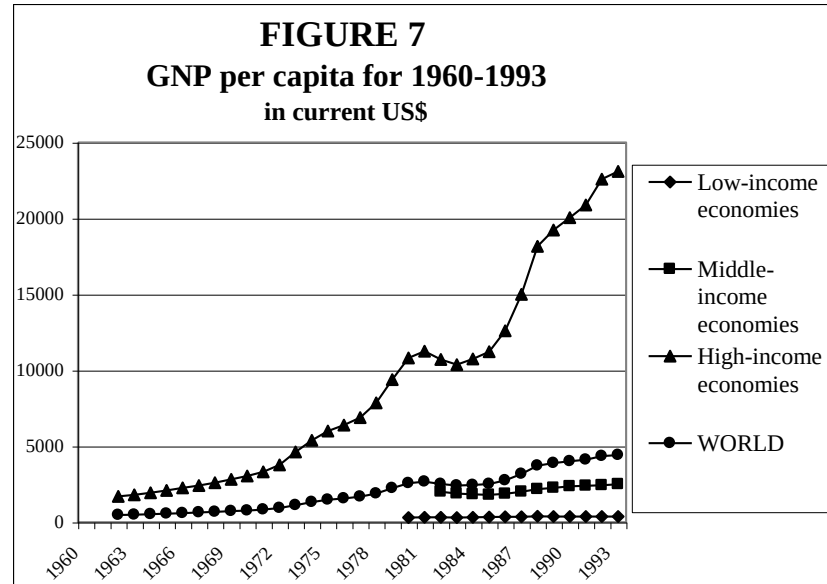


FIGURE 7
GNP per capita for 1960-1993
 in current US\$



HCURED Regresin Card Cards for 1902020 IIF=A*B*HRH

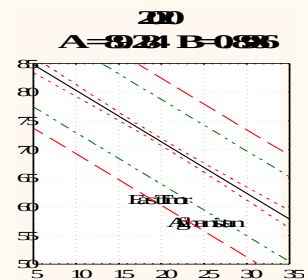
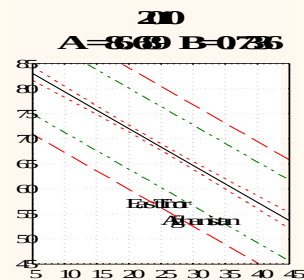
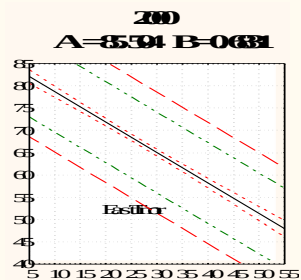
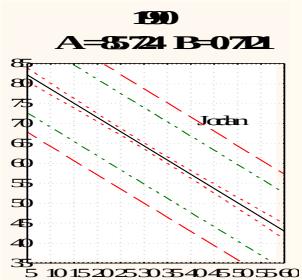
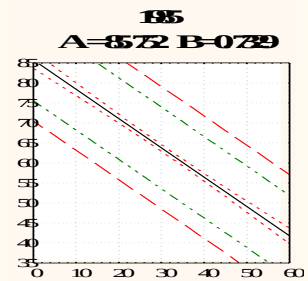
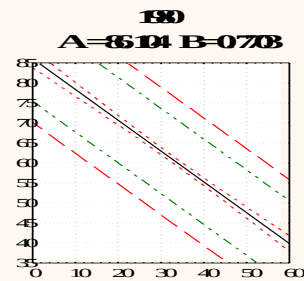
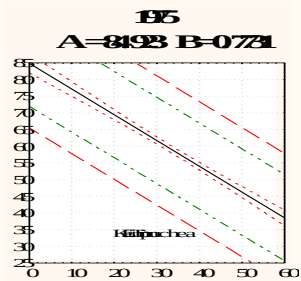
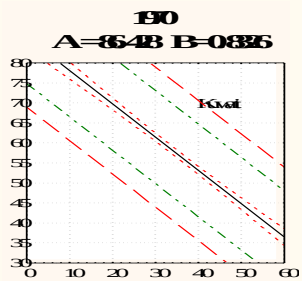
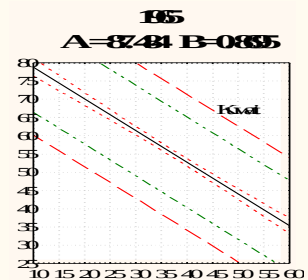
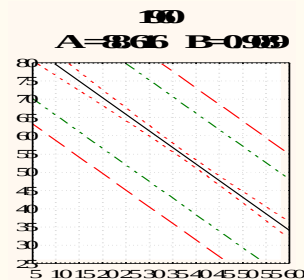
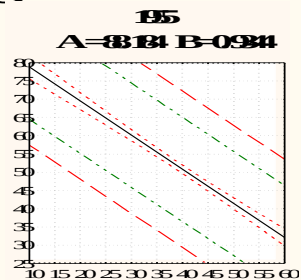
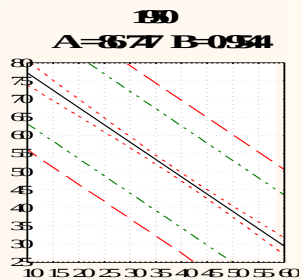


FIGURE 11. Regression Control Chart for LIFE vs BIRTH in 1950-2020

Regression Equation: $LIFE = 82.4 - .869 * BIRTH$

Correlation: $-.846$ N = 182 Std Err. of Est.: 6.17001

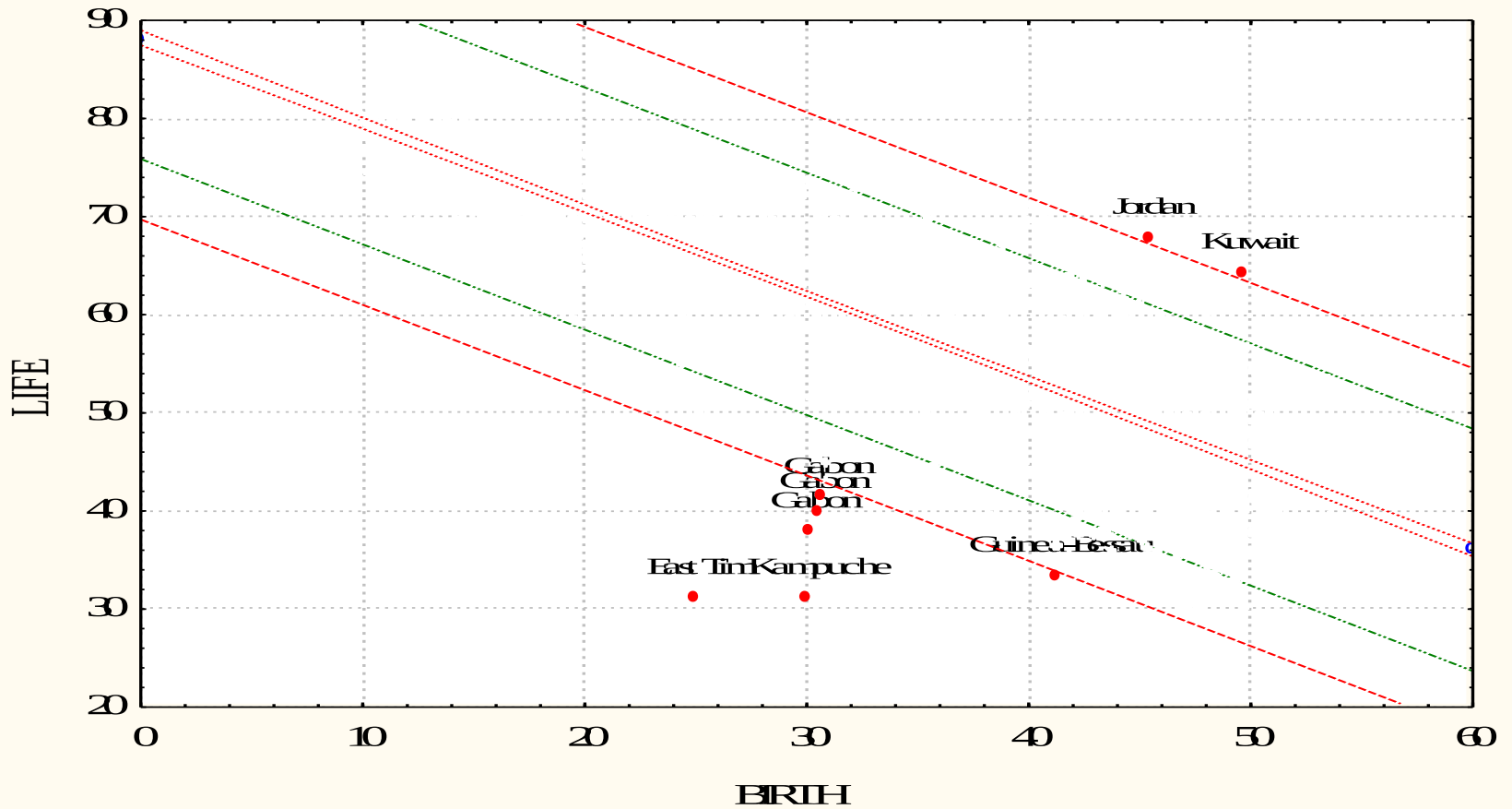
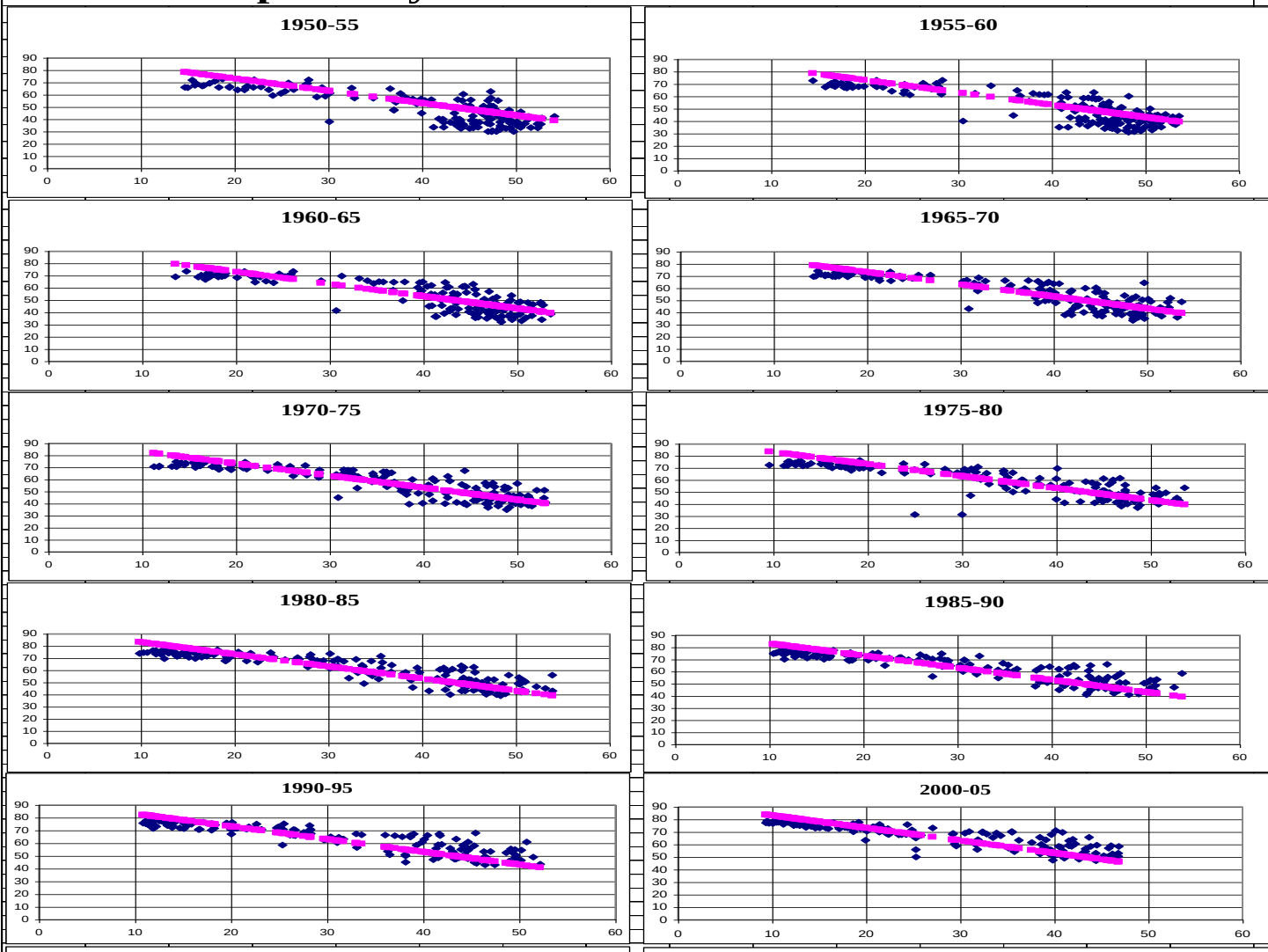


FIGURE 12
Life Expectancy = 93 - Birth Rate for 1950-2025



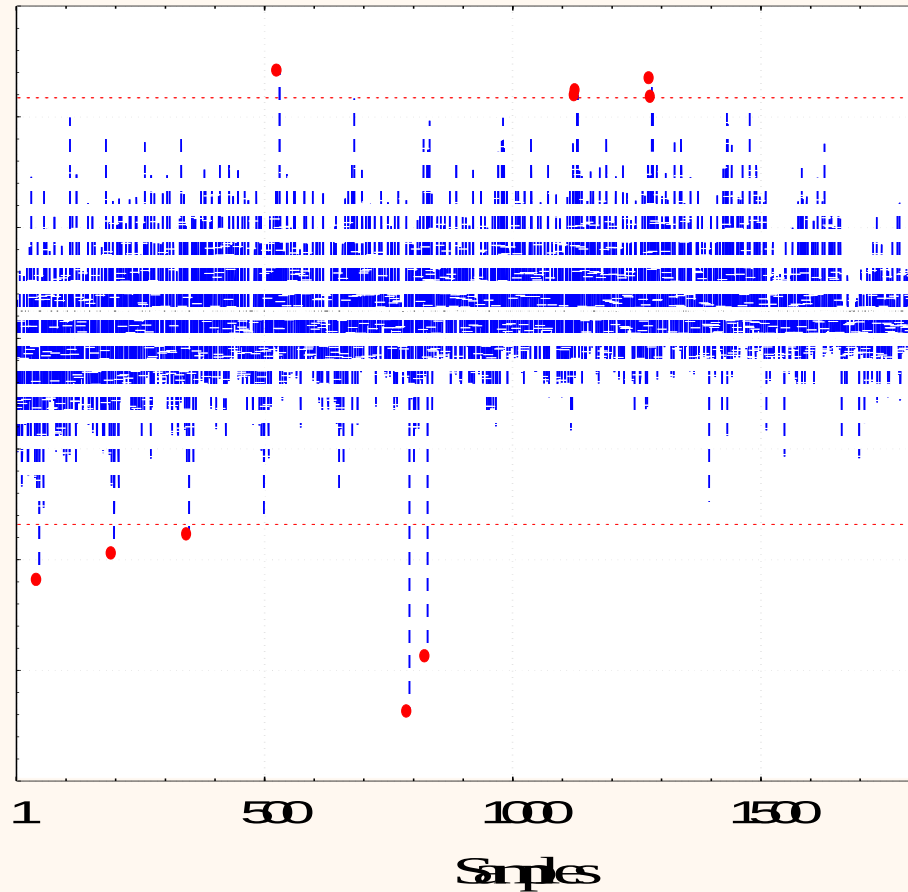
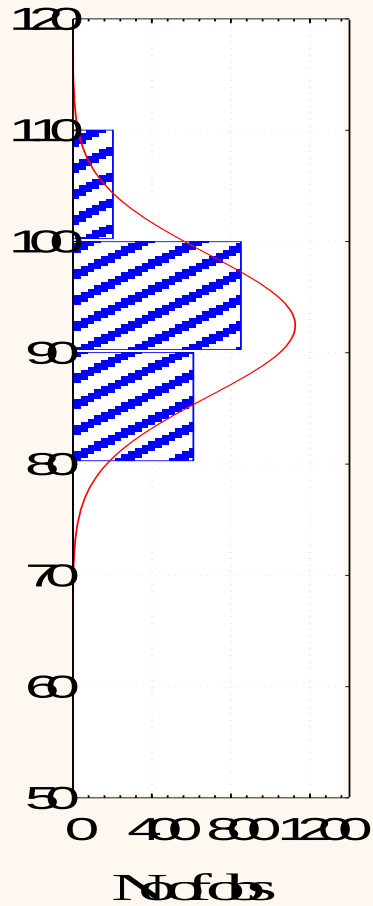
HCCREB

XBrdatfor(LIFE+BIRTH)in1980-2025

XBRMean924569, Focsignat642135

Histogram

X-Bar chart: (LIFE+BIRTH)



111.72

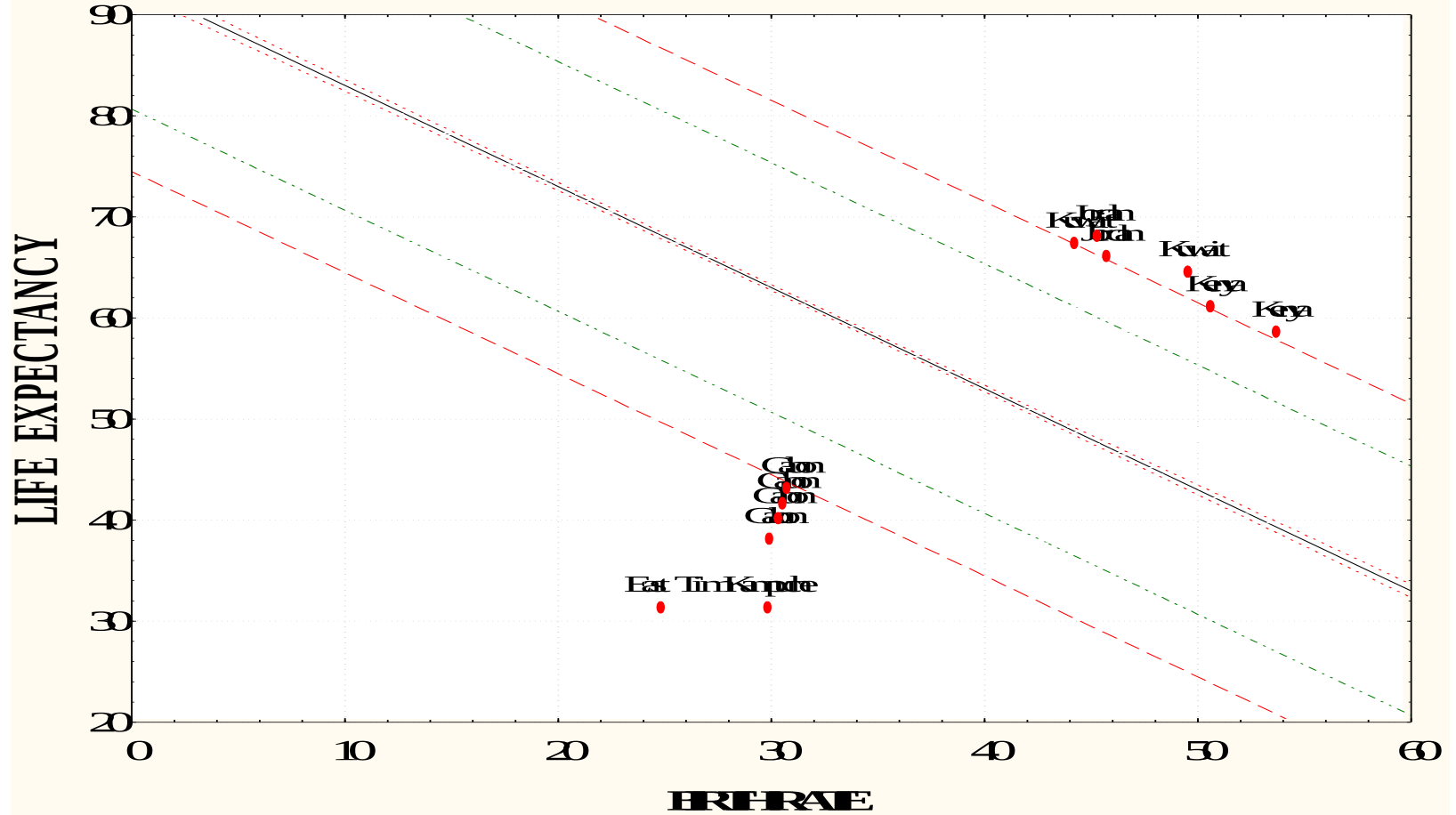
92.4569

73.1928

FIGURE 4

REGRESSION CONTROL CHART for Life Expectancy = 93 - 1.14 HIRAE in 1990/2005

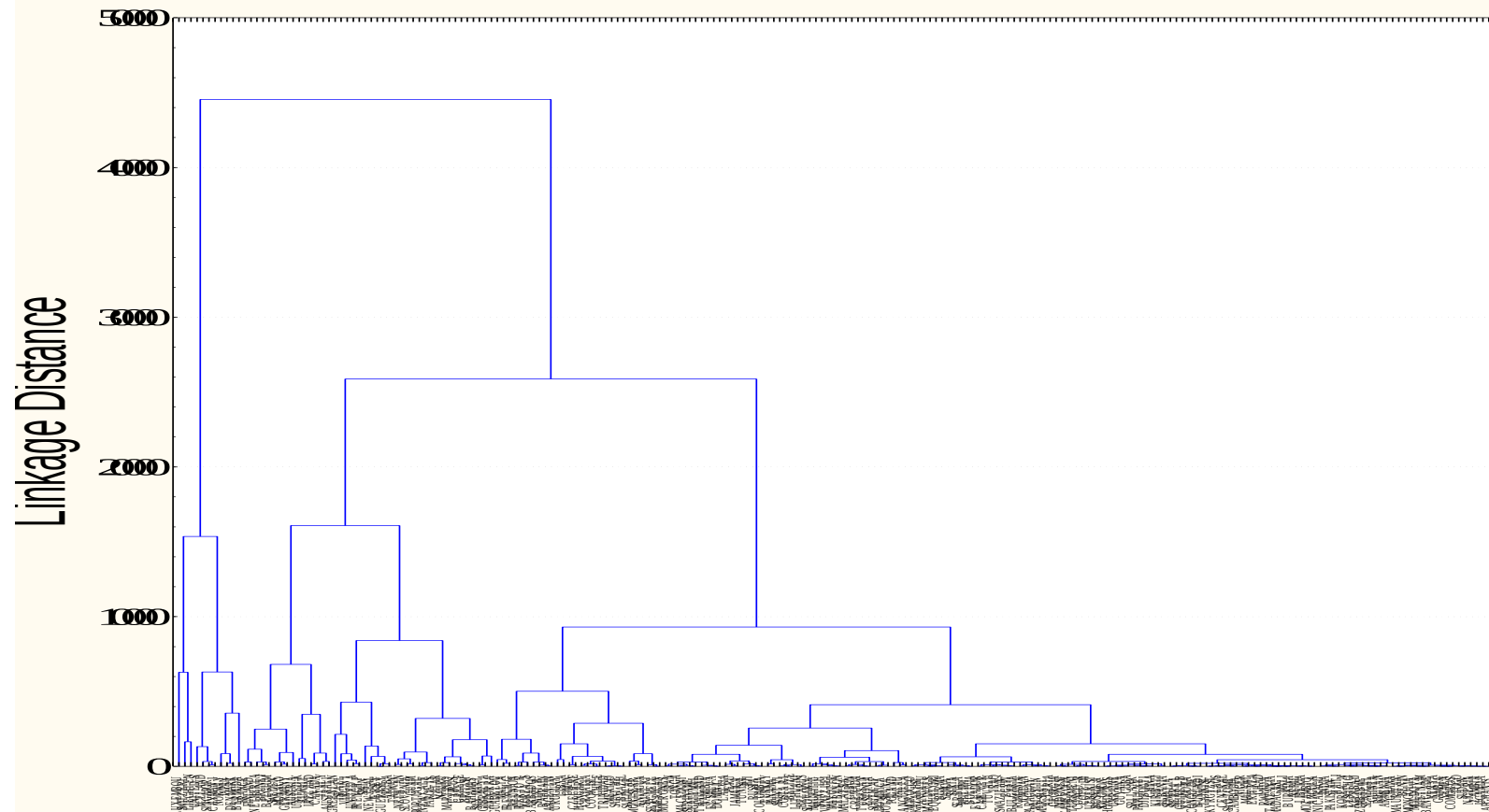
Correlation = -0.846 N = 1812 Std. Err. of Est.: 6.17101



Teil 29 Curtis 200

ComptelLinkage

Ecdysozoans



HCUR16

Scatterplot for Life Expectancy At Birth Versus Birth Rate

Data With Last Sixes

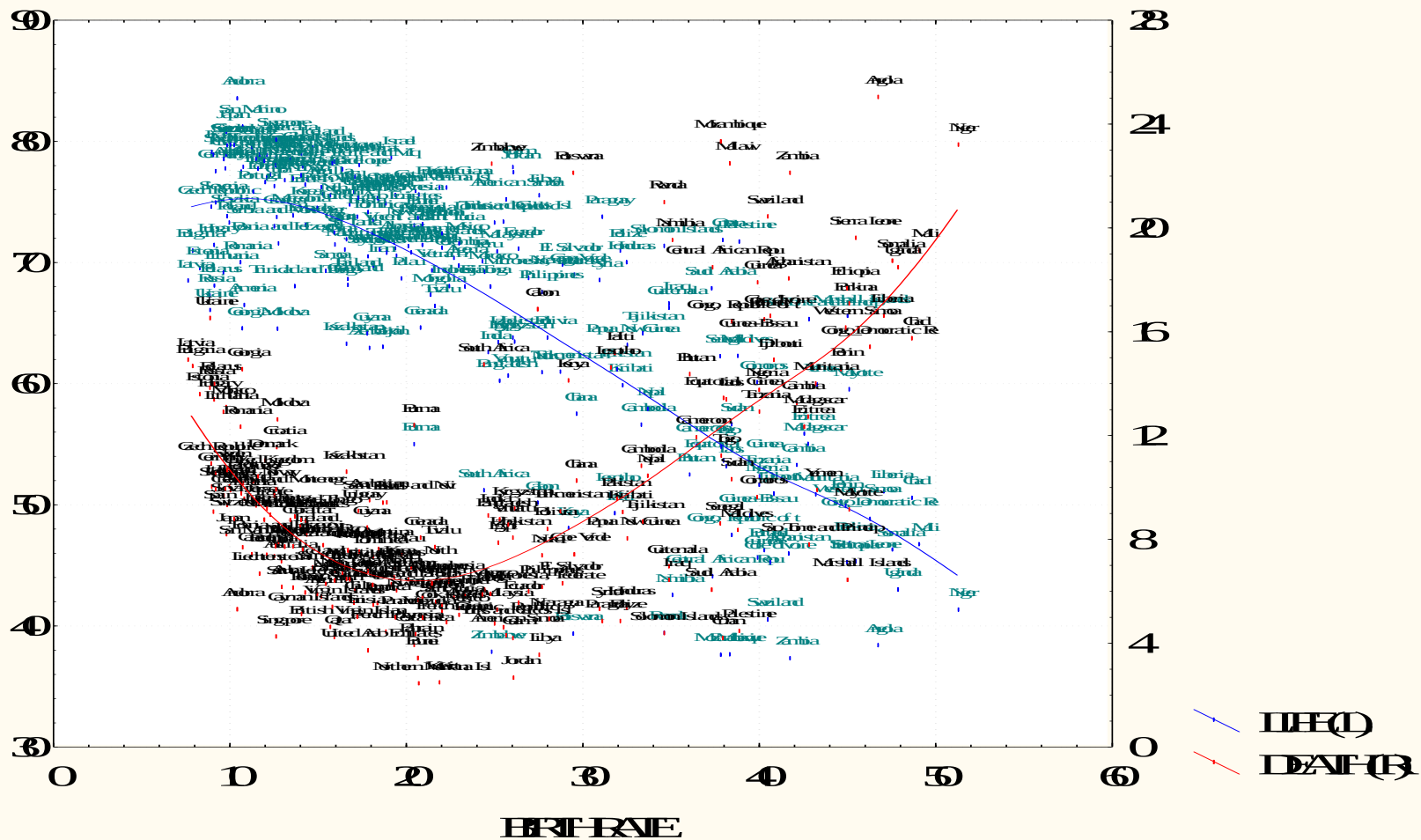


FIGURE 17

REGRESSION FOR COUNTRY Life Expectancy vs GDP per capita

Regression Equation: $LIFEEXPECTANCY = 2.23 + 0.07 \log(GDPpercapita)$

Correlation: 0.863 N=209 Std Err. of Est: 7.1295

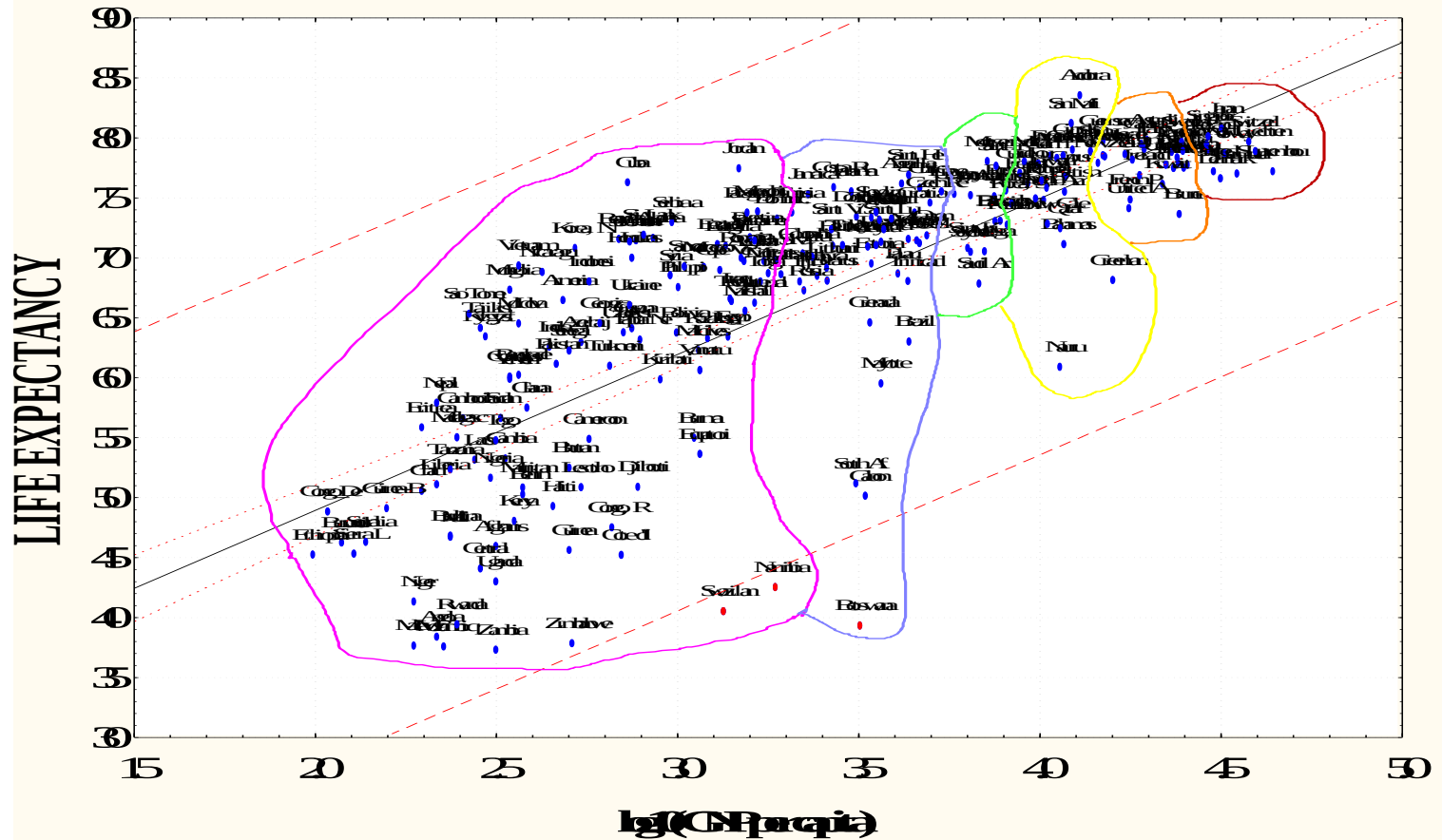


FIGURE 18
3D Contour Plot for Life Expectancy
Distance Weighted Least Squares

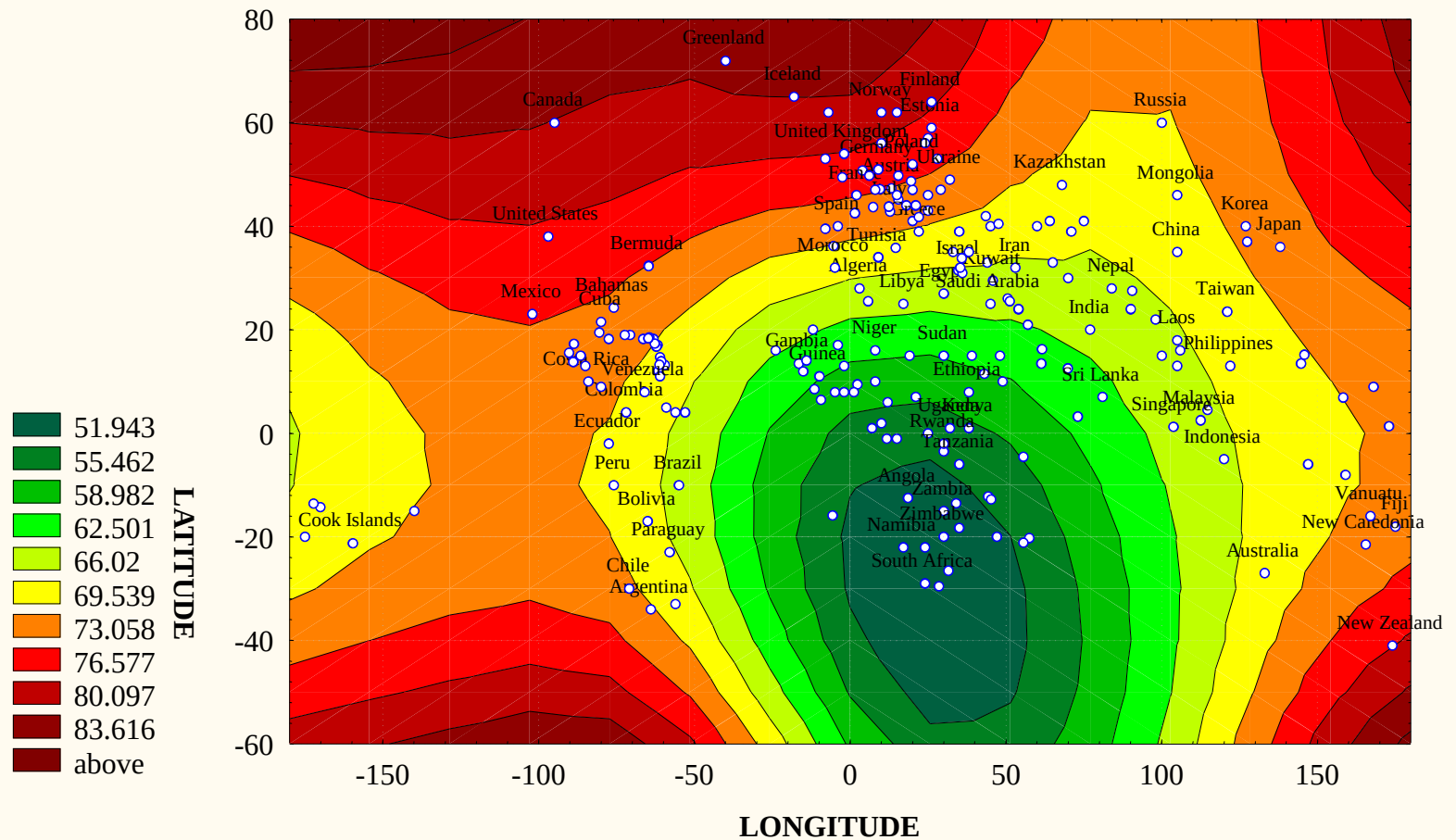


FIGURE 19
3D Contour Plot for Birth Rate
Distance Weighted Least Squares

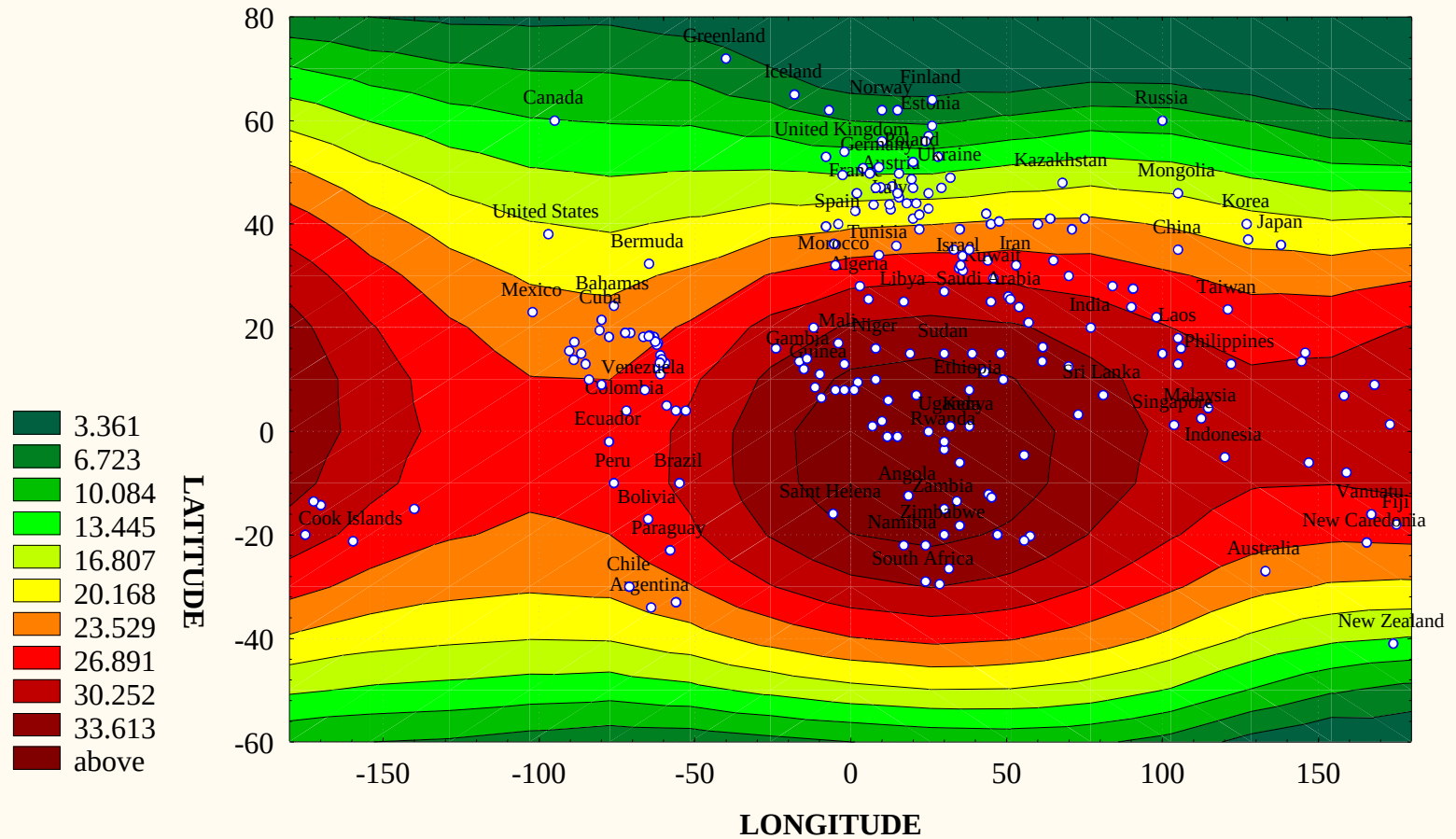


FIGURE 20
3D Contour Plot for Death Rate
Distance Weighted Least Squares

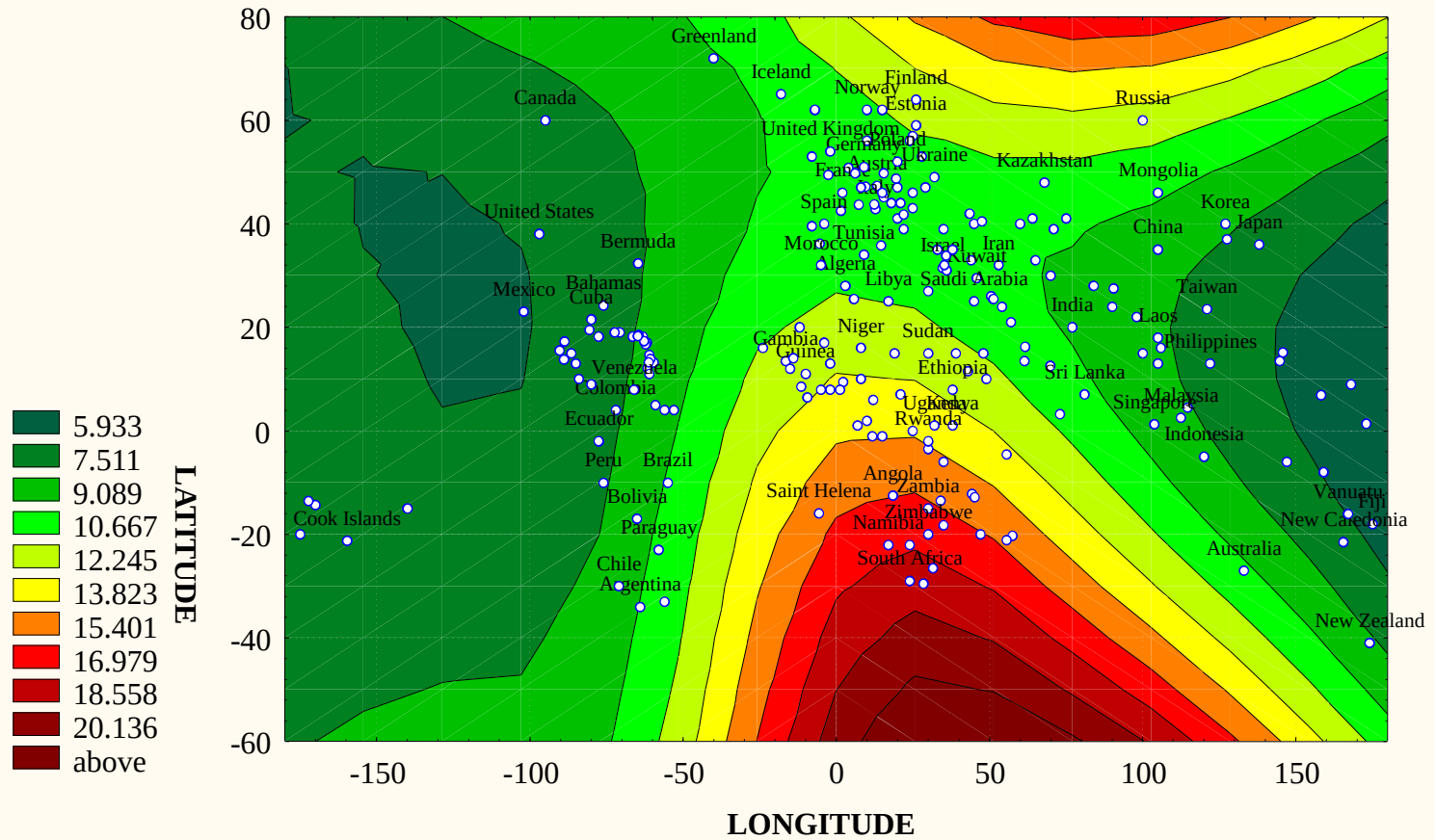


FIGURE 21
3D Contour Plot for GNP per capita
Distance Weighted Least Squares

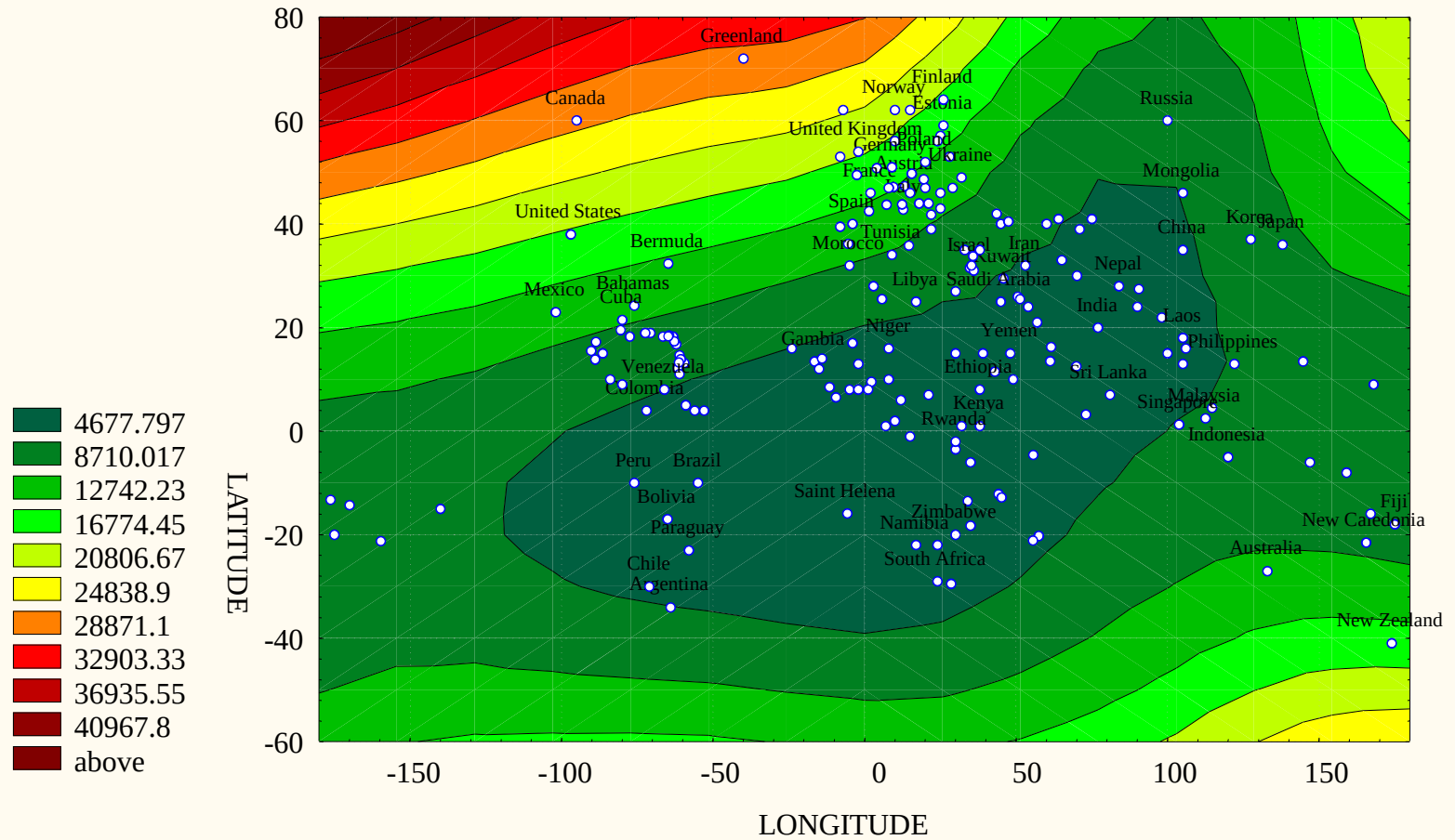


FIGURE 22

3D Contour Plot for Life Expectancy Vs Birth Rate and GNP per capita
Distance Weighted Least Squares

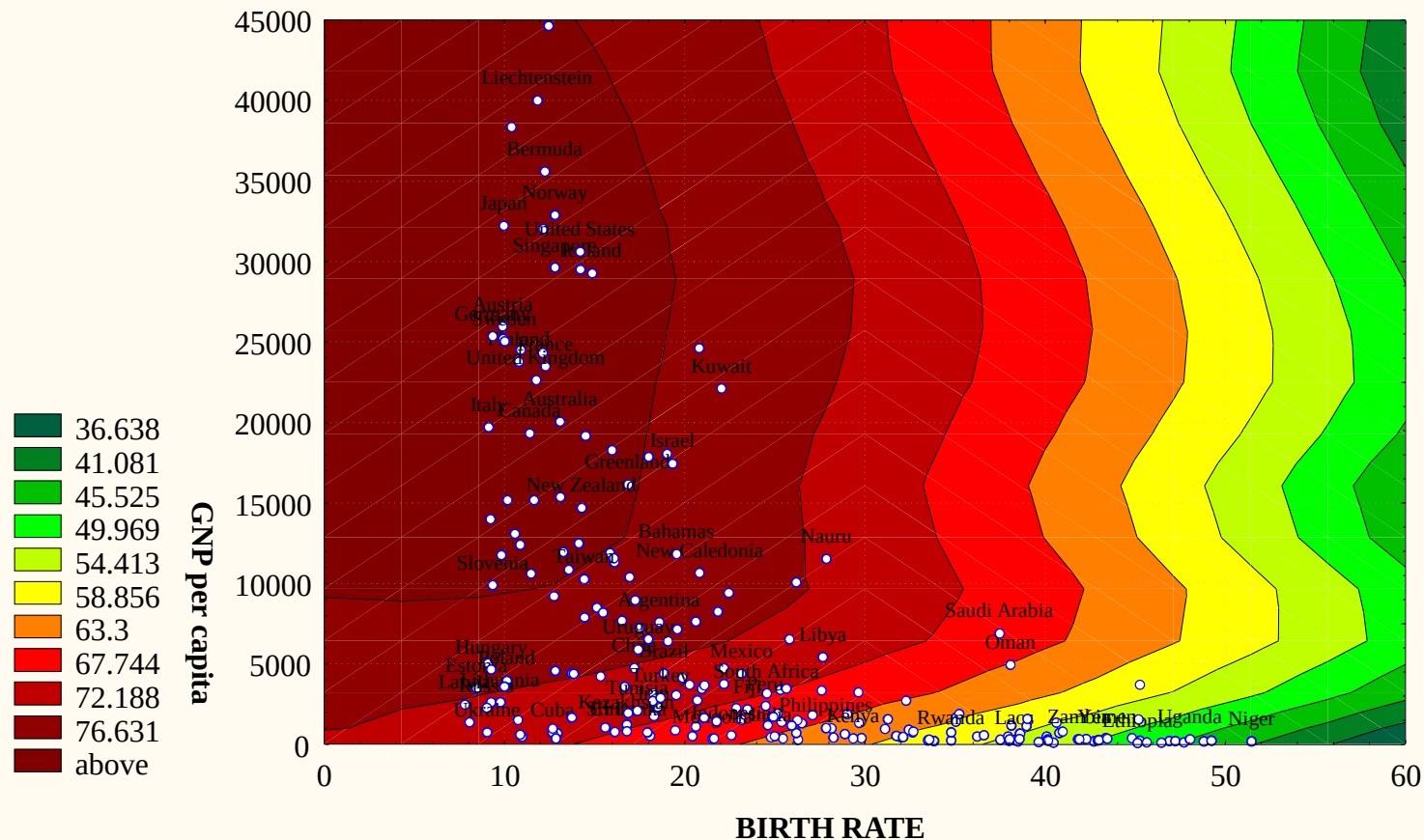


Figure 24
Regression Control Chart for Birth Rate Vs Literacy

$$\text{Birth Rate} = 61.263 - 0.4678 * \text{Literacy}$$

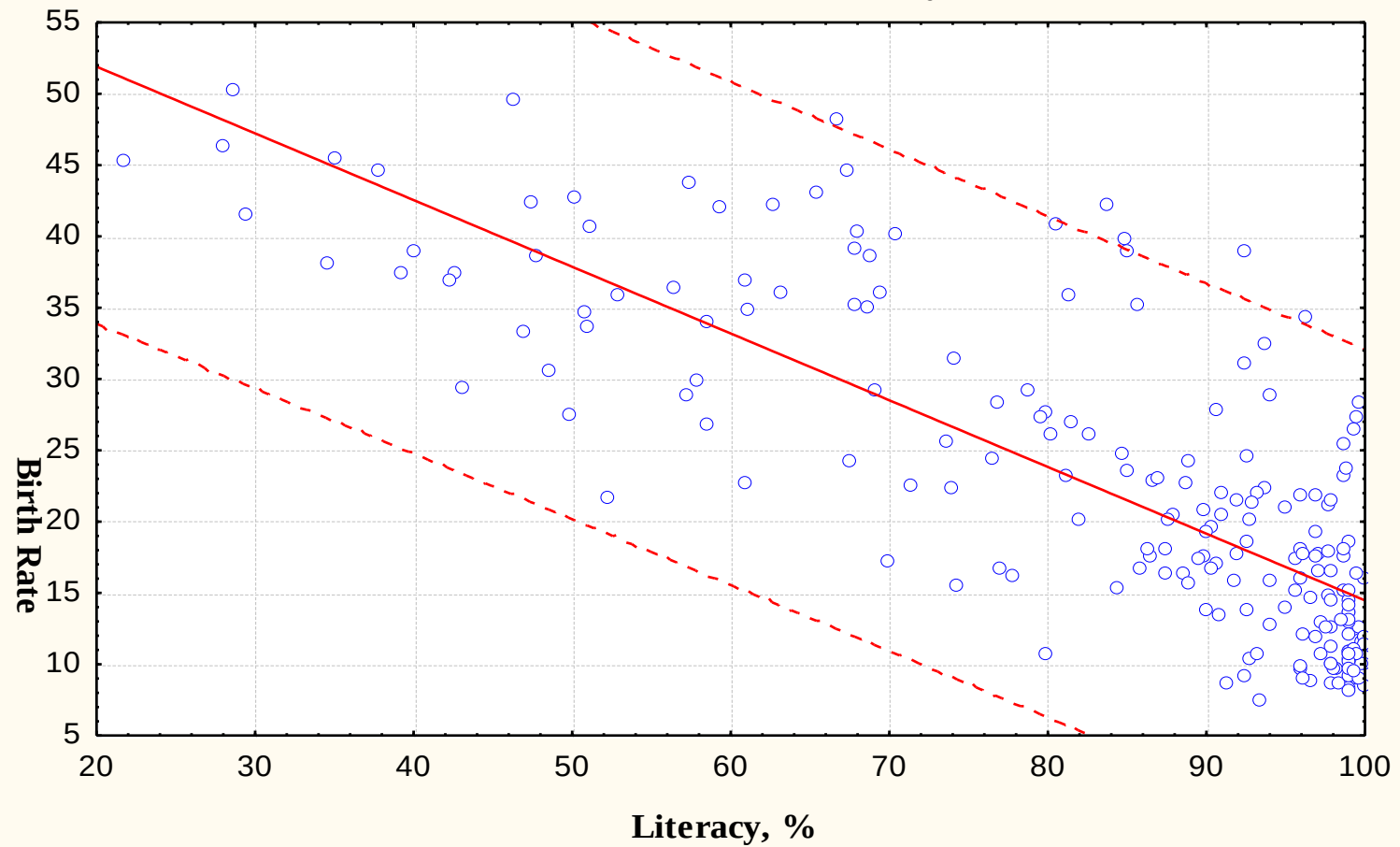


Figure 25
Quadratic Regression Control Chart for Death Vs Birth Rate

$$\text{Death Rate} = 15.0898 - 0.7754 * \text{Birth Rate} + 0.0182 * \text{Birth Rate}^2$$

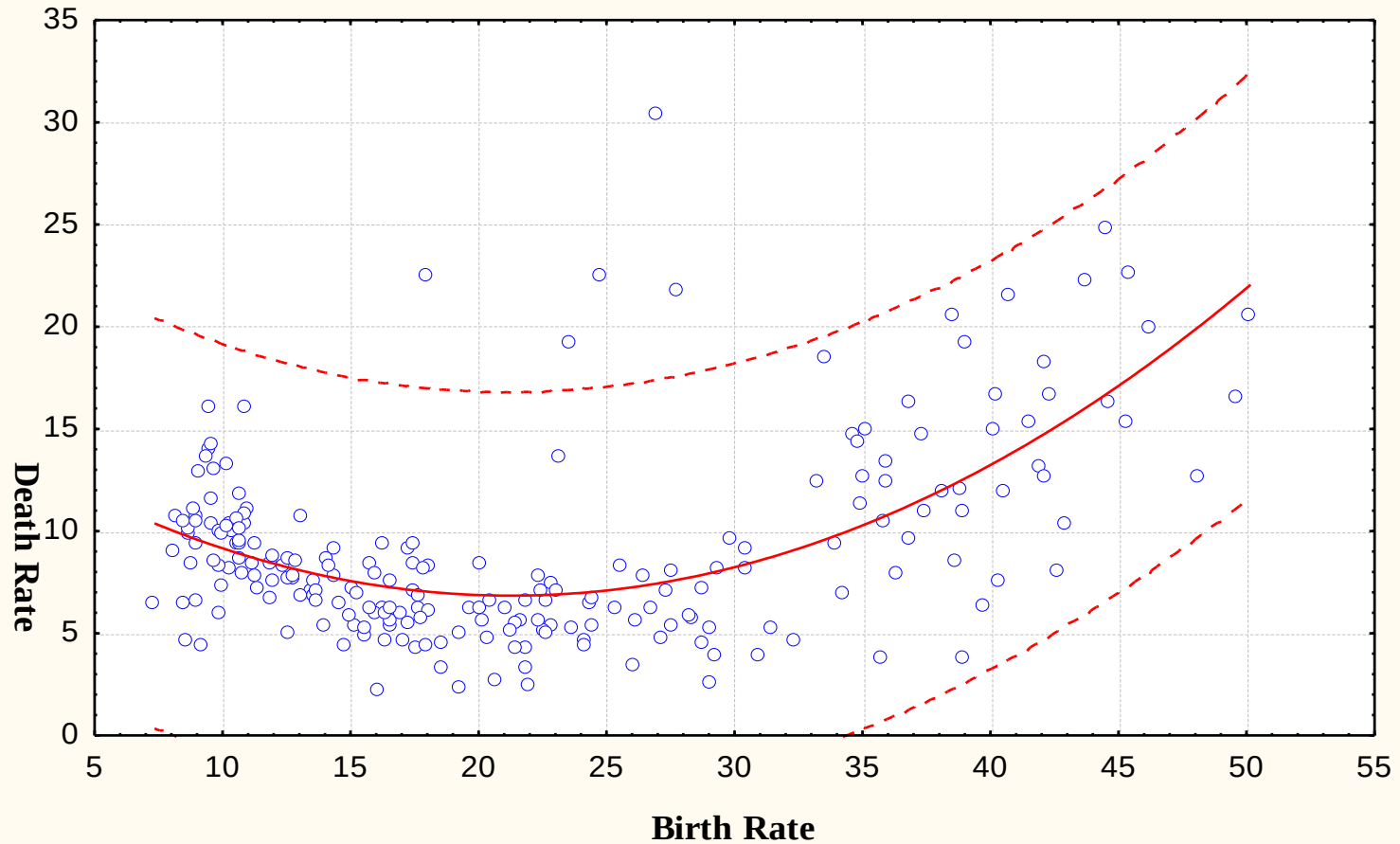
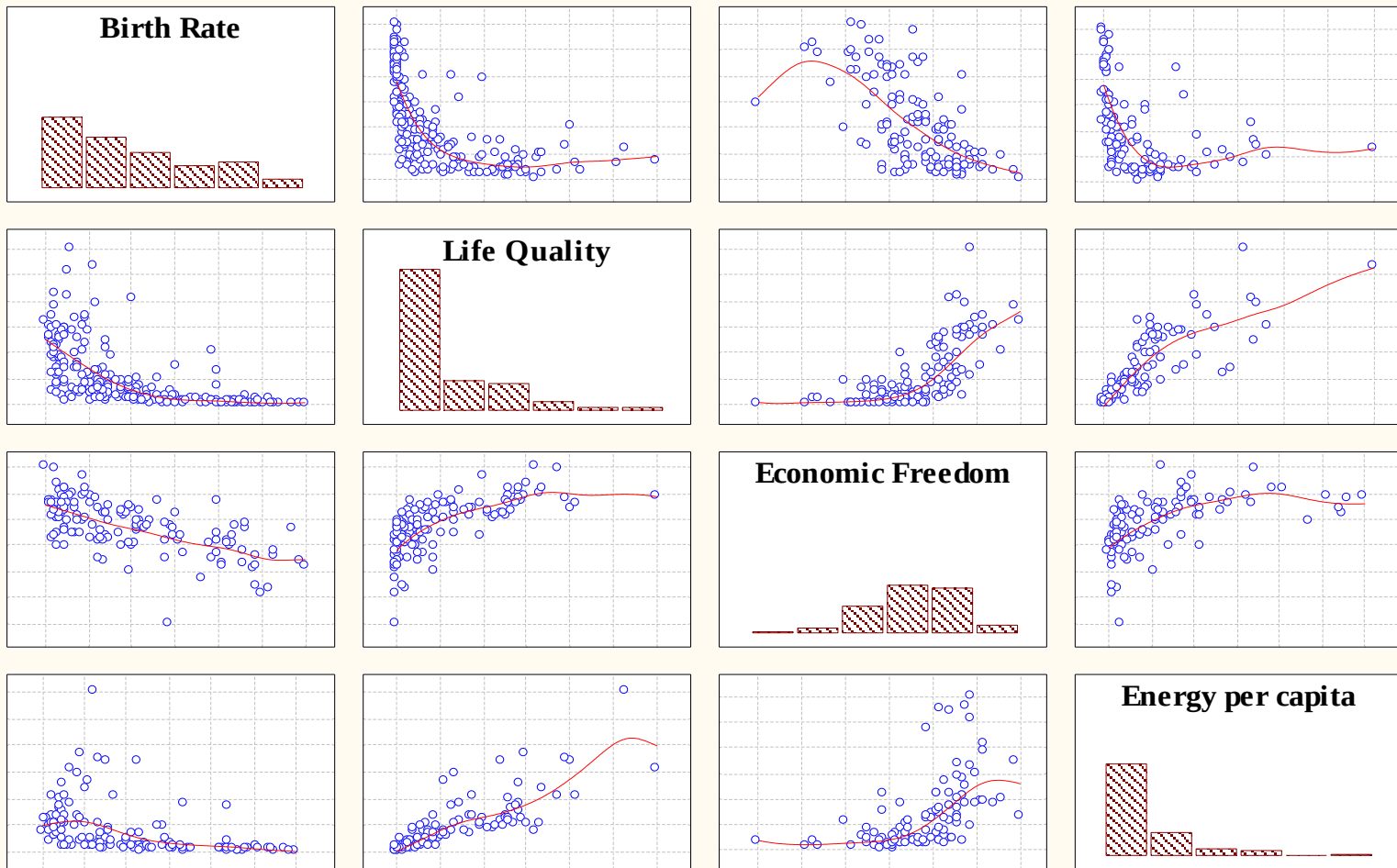


Figure 26
Matrix Plot for Main Factors in 2006



LIFE QUALITY = GDP PER CAPITA * LIFE EXPECTANCY

GOLDEN LIFE QUALITY = LIFE QUALITY/PRICE OF GOLD

- **HIGH LIFE QUALITY IS ASSOCIATED WITH:
HIGH ENERGY CONSUMPTION PER CAPITA,
LOW BIRTH RATE AND
HIGH ECONOMIC FREEDOM**
- **NUCLEAR POWER, RENEWABLE ENERGY AND
EFFICIENT CARS ARE KEYS TO THE US ENERGY
INDEPENDENCE**
- **BIRTH CONTROL COULD BE DONE BY LITERACY,
EDUCATION AND PREVENTIVE MEASURES WITH
MINIMAL ABORTION**

Figure 27

Life Quality = $4.7774 \cdot 10^6 \cdot \exp(-0.1073 \cdot \text{Birth Rate})$; R Square=44.12%

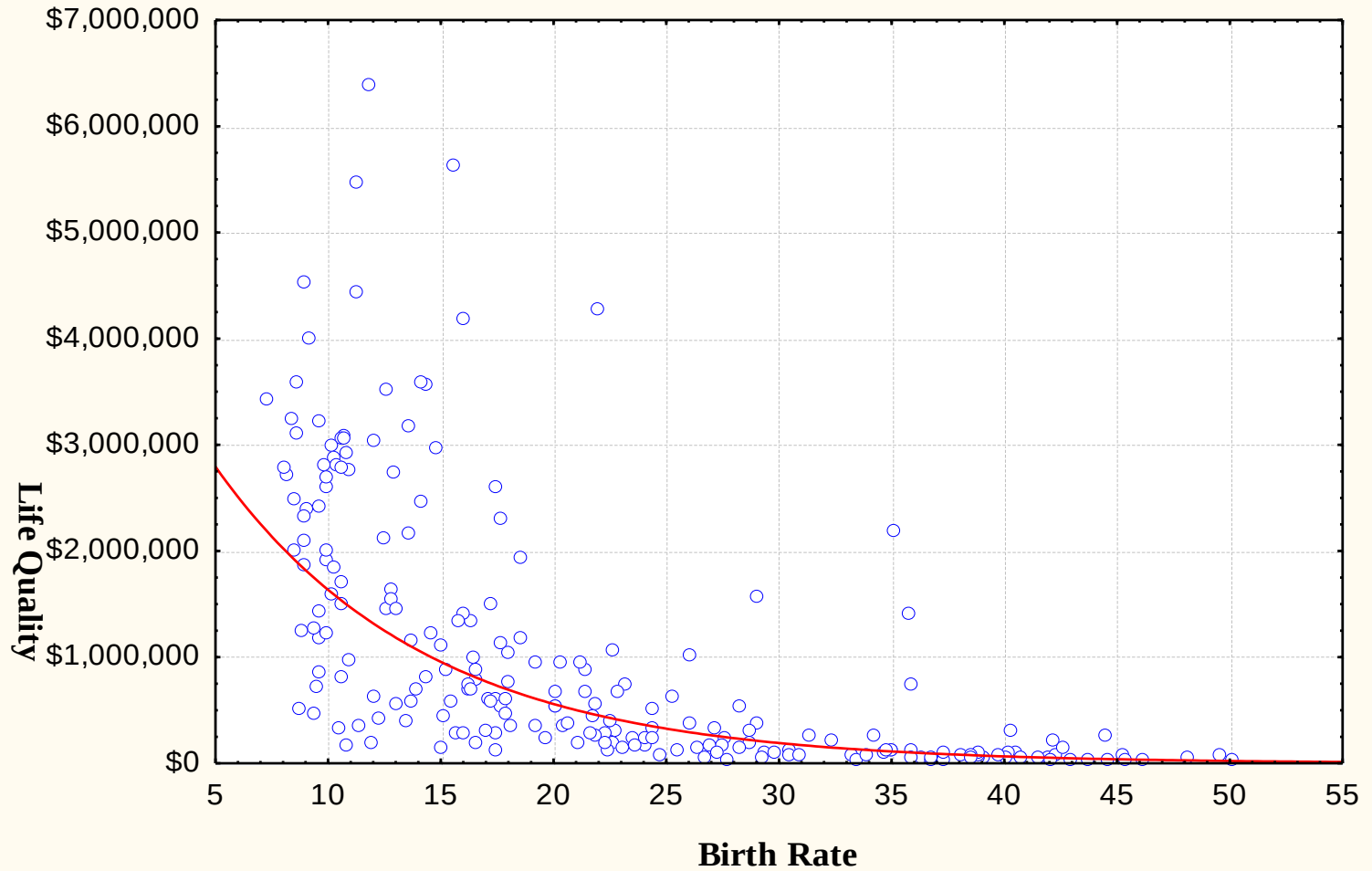


Figure 28

*Life Quality=339.6778*exp(1.1015*Economic Freedom); R Square=52.04%*

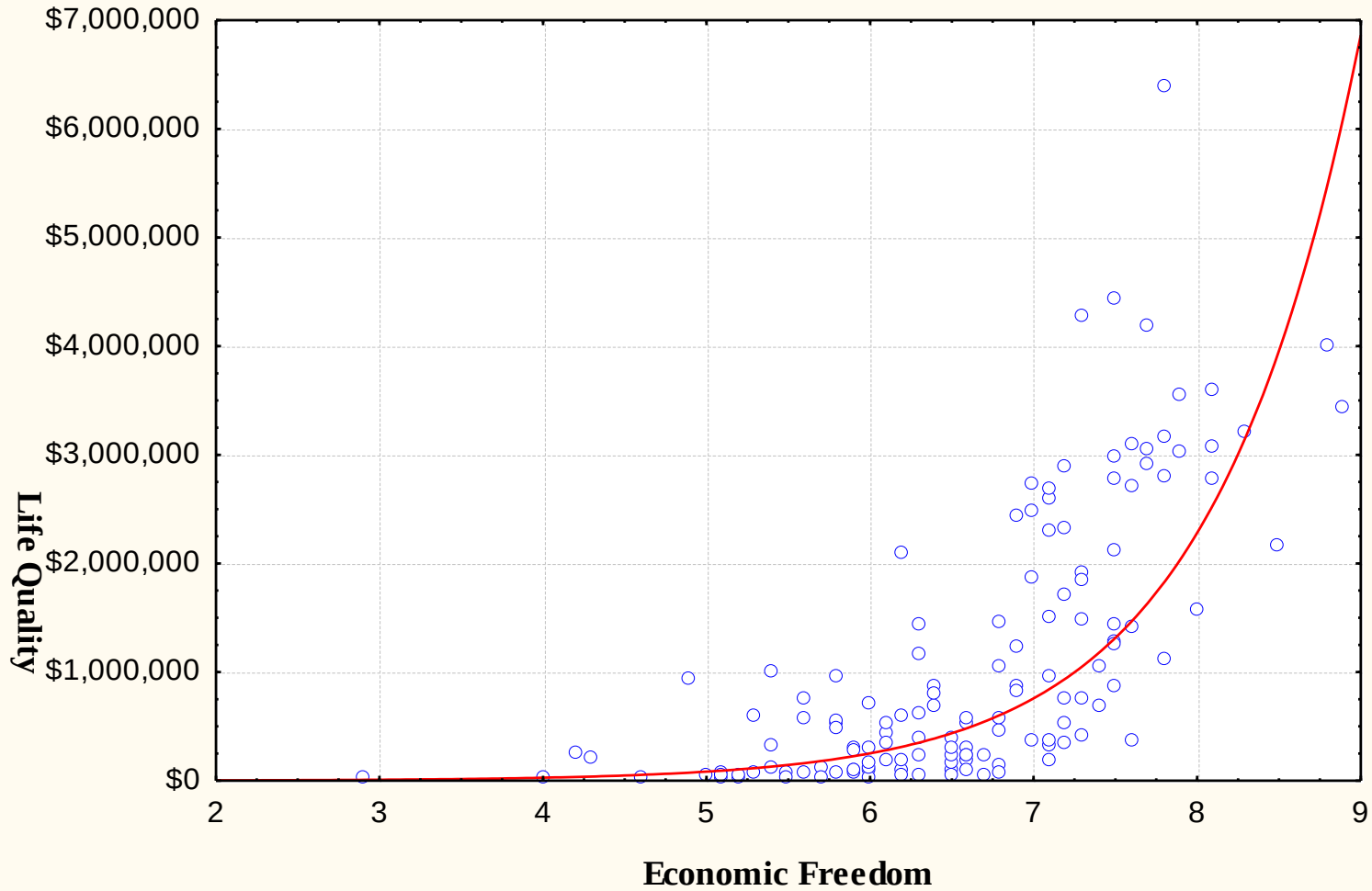


Figure 29

Life Quality= $2.7754 \times 10^5 + 346.0436 \times \text{Energy per capita}$; *R Square*=68.51%

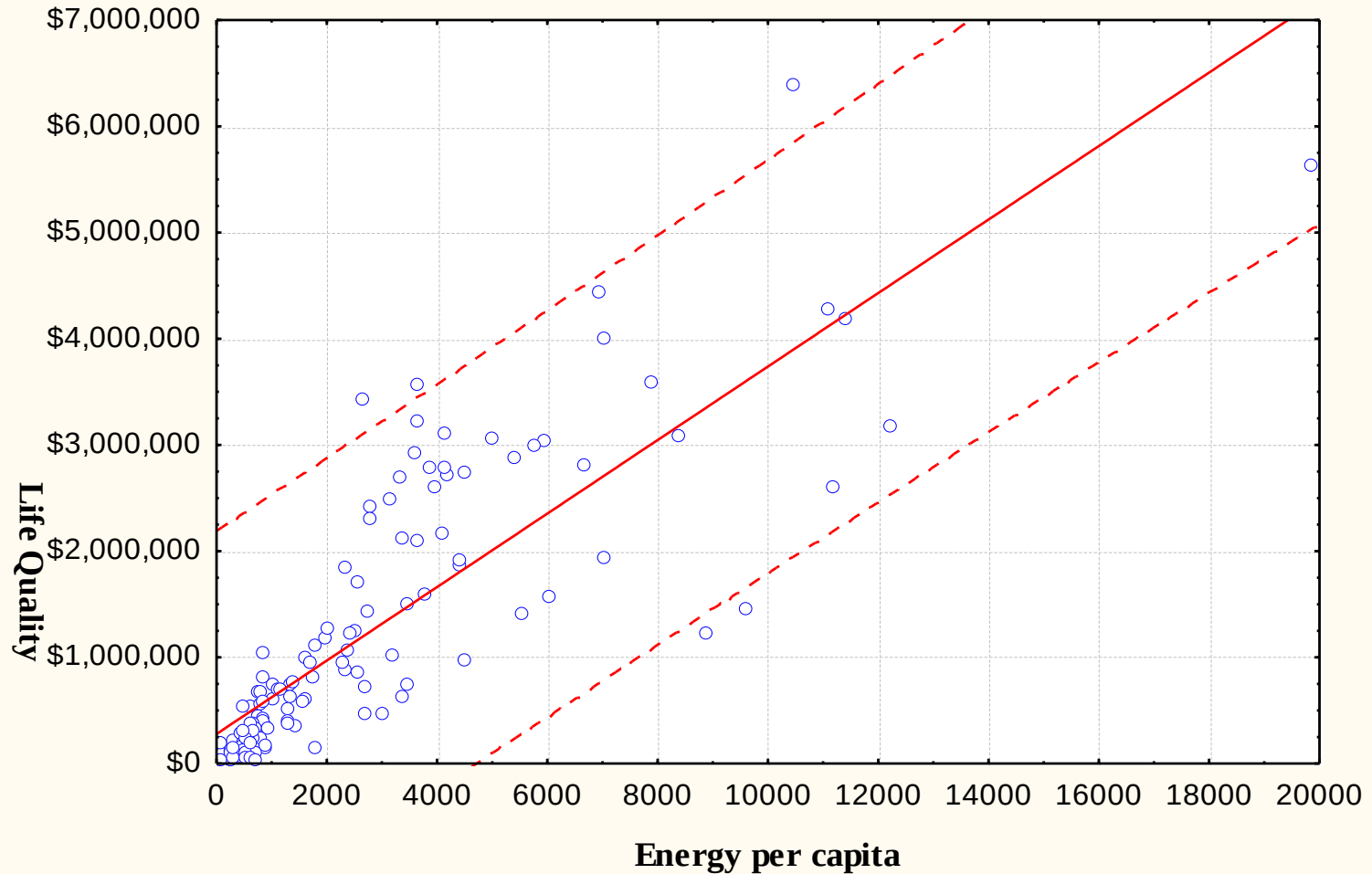


Figure 30. Multiple Regression Control Chart for Life Quality

Observed=-40,691.965+1.0176*Predicted; R Square=84.25 %

*Life Quality=490.7785*Birth Rate^(-0.4166)*Economic Freedom^{2.0532}*Energy per capita^{0.6362}*

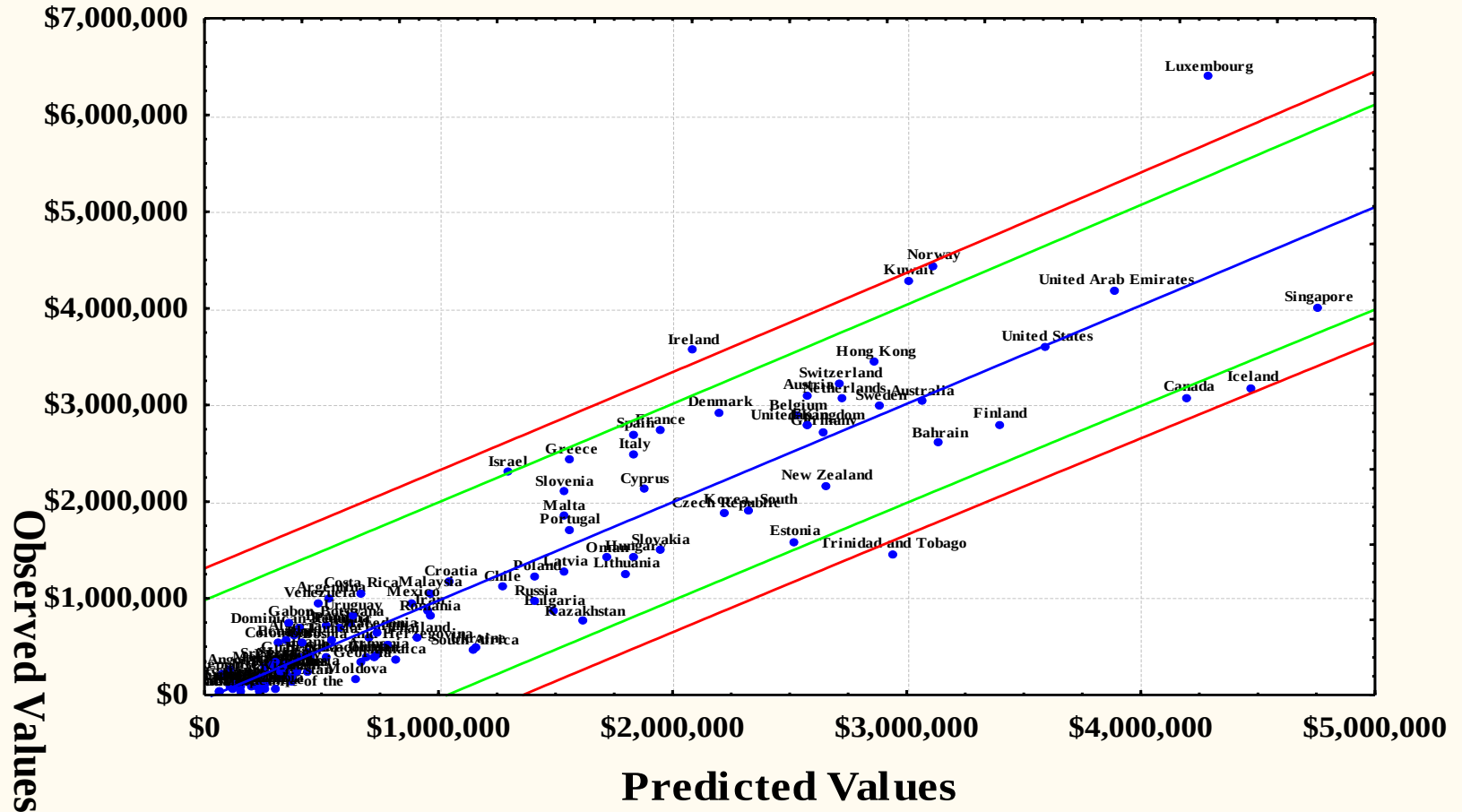


Figure 31. Multiple Regression Control Chart for Life Quality in Developing Countries

$$\text{Observed} = -40,691.965 + 1.0176 * \text{Predicted}; R \text{ Square} = 84.25\%$$

$$\text{Life Quality} = 490.7785 * \text{Birth Rate}^{(-0.4166)} * \text{Economic Freedom}^{2.0532} * \text{Energy per capita}^{0.6362}$$

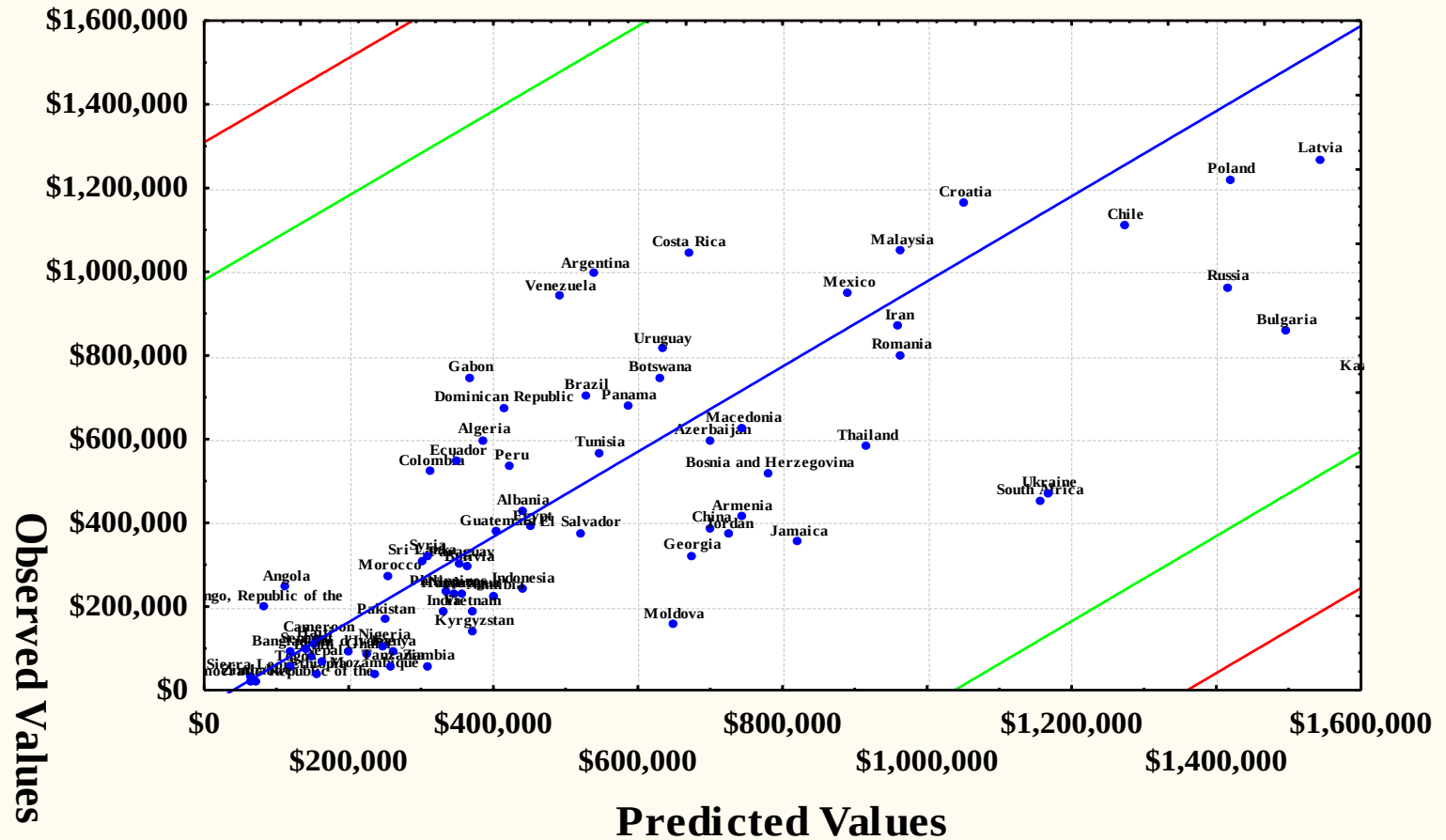


Figure 32

Life Quality in NIS after breakdown of USSR

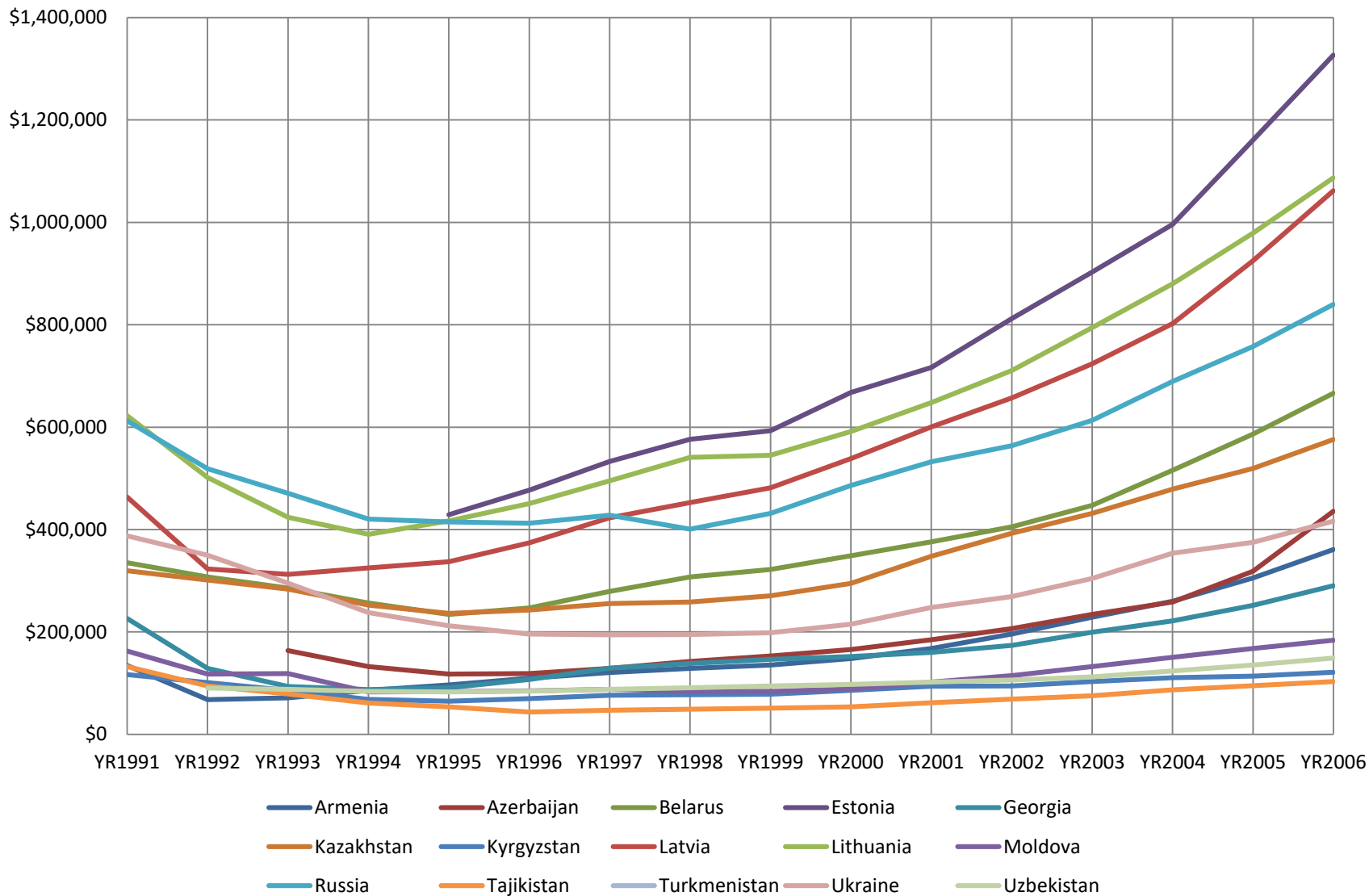


Figure 33

NIS Relative Life Quality after breakdown of USSR (YR1991=100%)

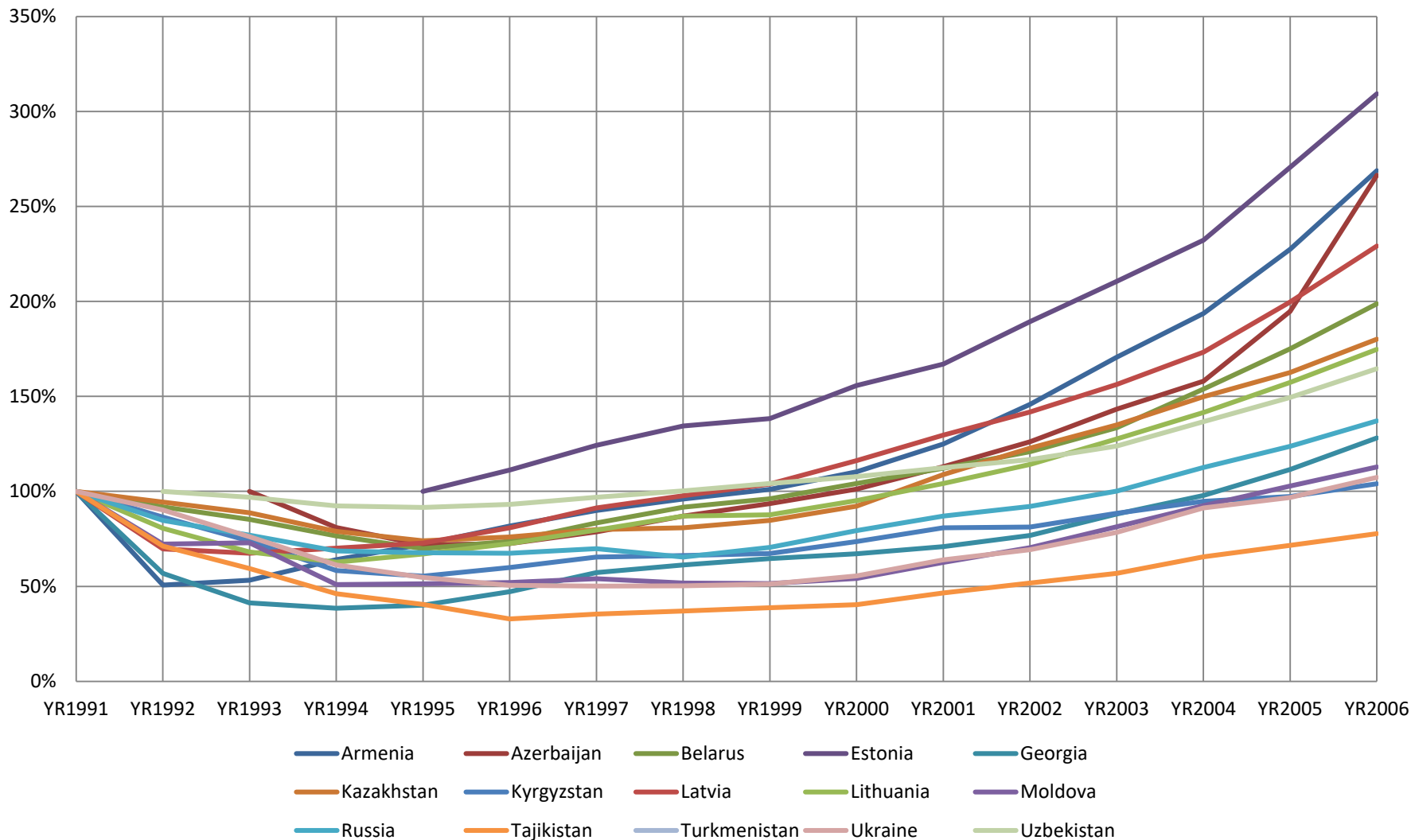


Figure 34

NIS Relative Life Quality Recovery after breakdown of USSR

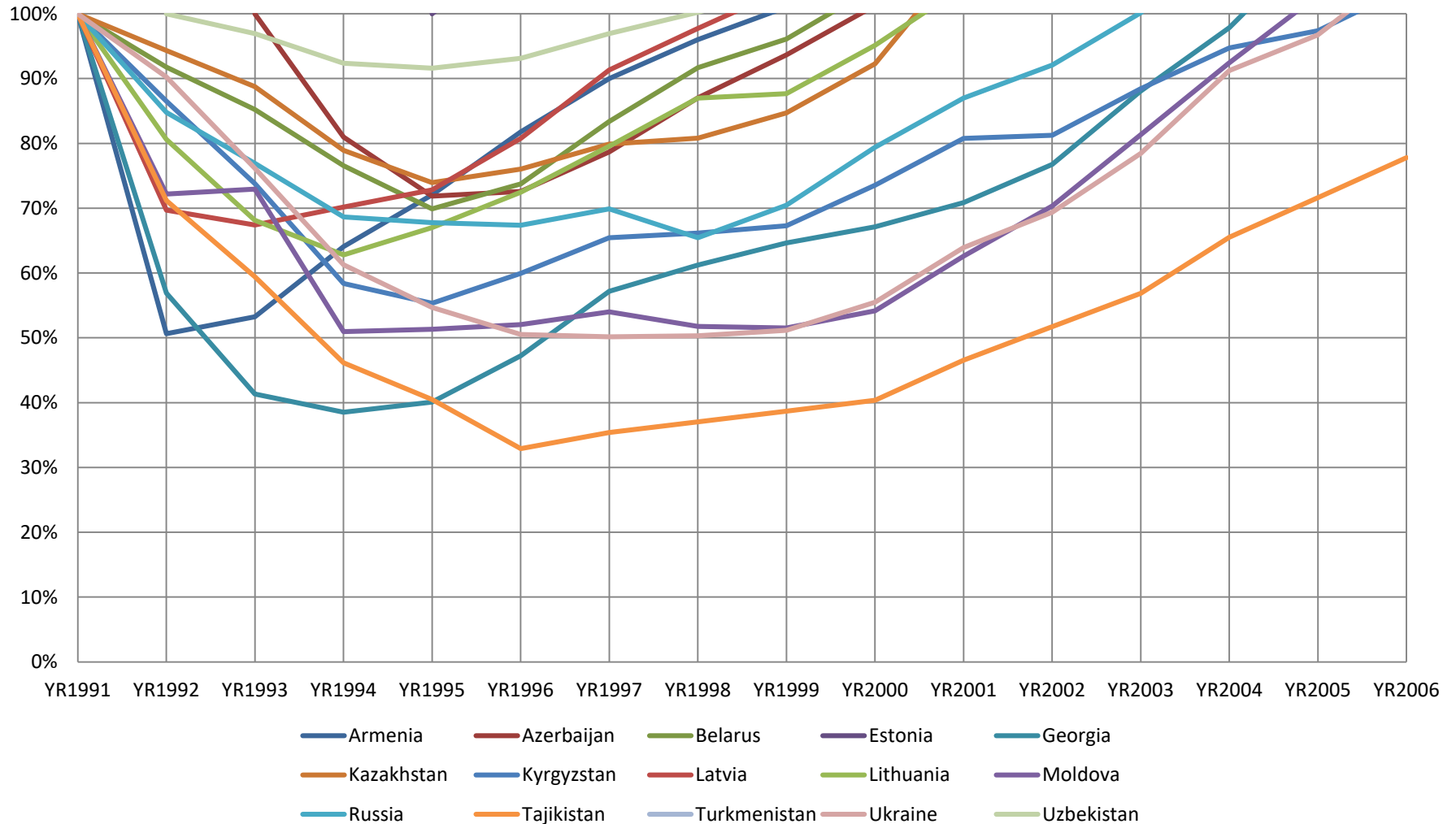


Figure 34. Golden Life Quality for 7 NIS, oz. per capita

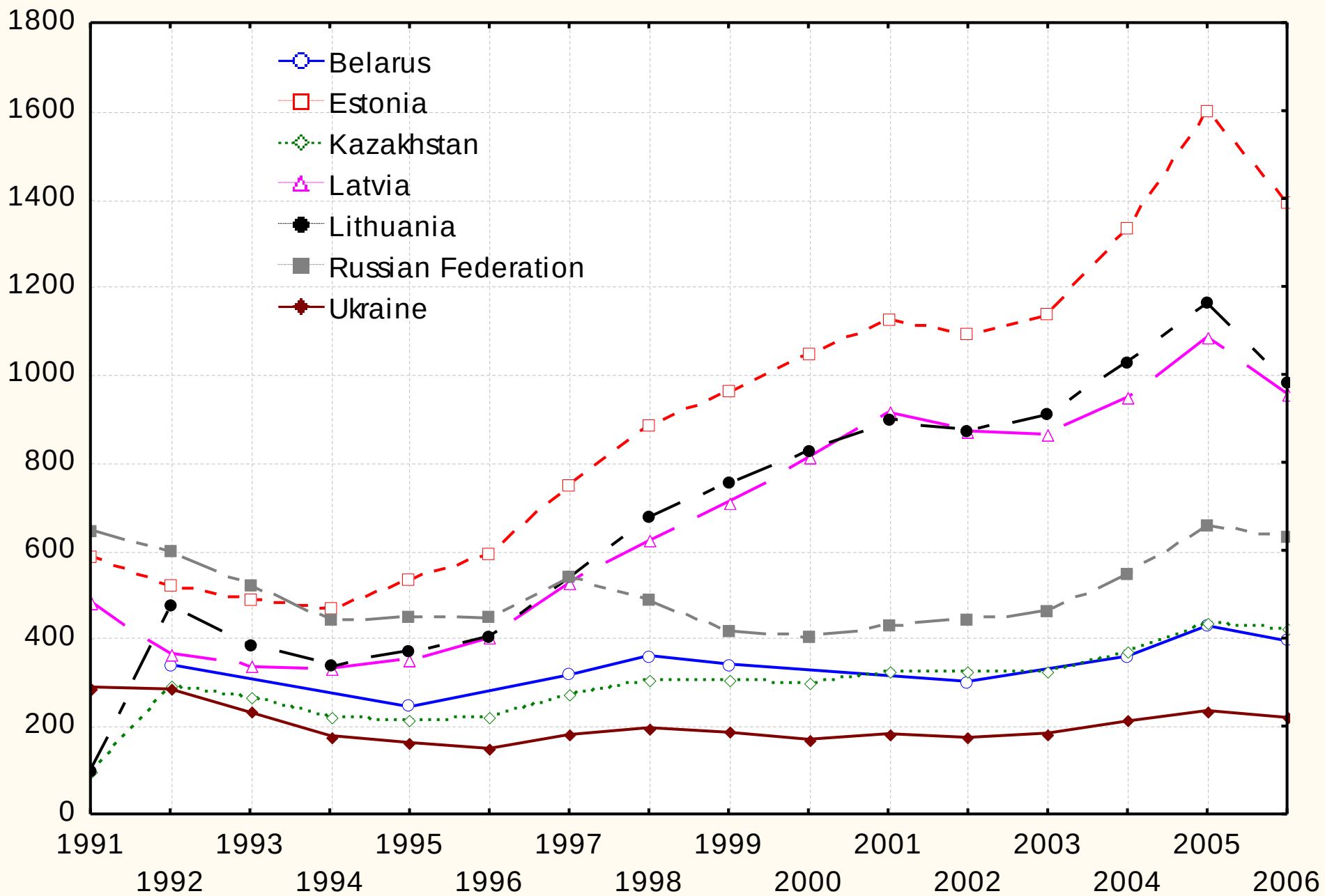
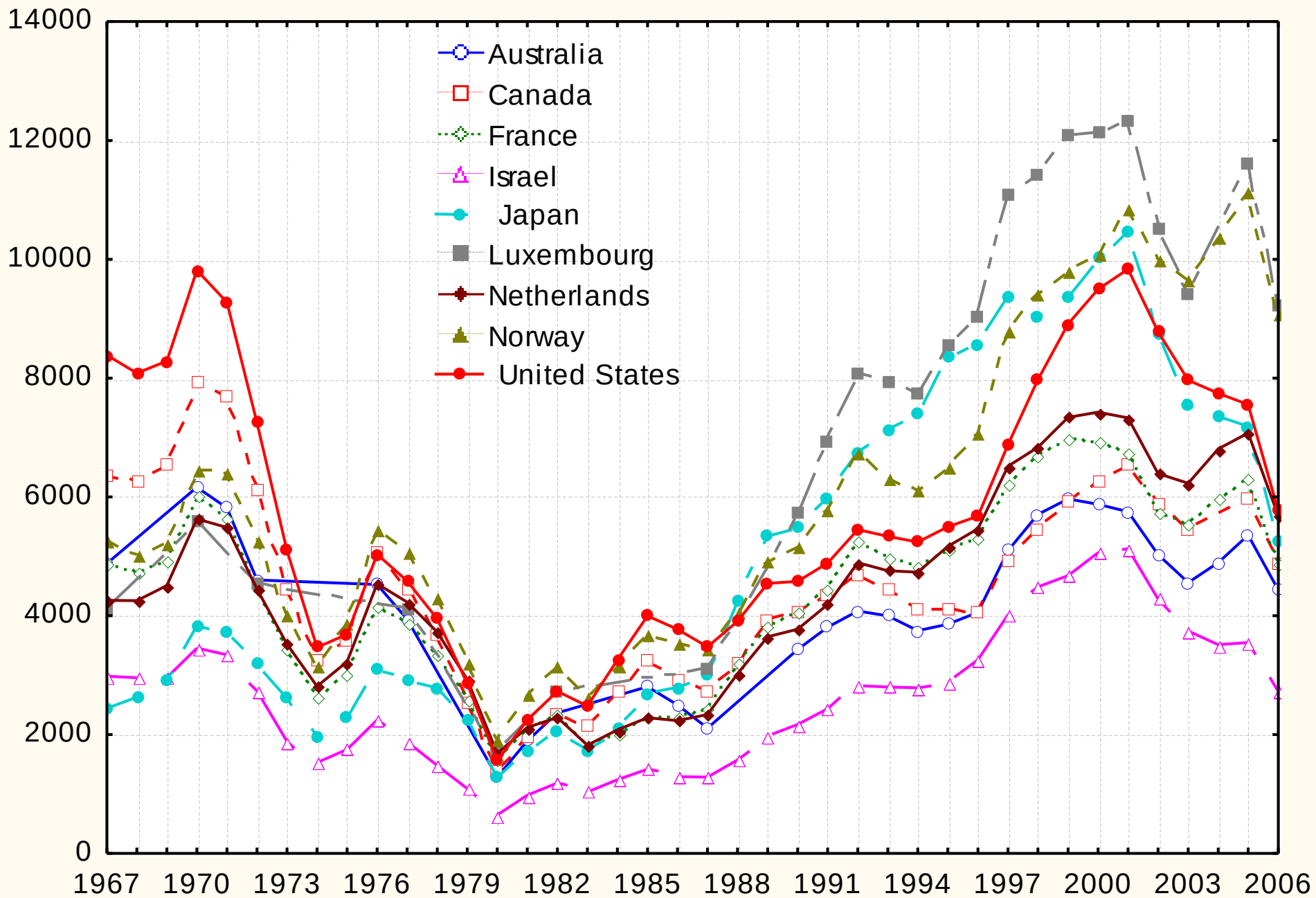


Figure 35. Golden Life Quality for 9 Developed Countries, oz. per capita



Energy Strategy against Recession

- Creation of the US National Power Grid as an important part of National Energy Strategy
- Construction of “Electricity Highways” – Direct Current Transmission Lines to open the door for cheap power from mid-section of the country to the coasts
- Re-build Nuclear Power Plants instead of demolished with existing infrastructure and manpower
- Create Universal Power Market Rules for the entire country

Standard Market Design Problems

- Business Risk (High Power Price Volatility)
- Generators Bankruptcy (Low Rate of Return)
- High Uniform Prices set by the most expensive marginal unit
- Large On-line Surpluses (Partial Dispatch)
- Higher Air Pollution (Lower Fuel Efficiency)
- Low Transparency (More Call Tickets)
- Price Taker Philosophy under Uniform Pricing
- Unsatisfactory design of the Energy Market (96 % of total money involved) led to creation of many additional (often artificial) markets and auctions
- All-in-one Market Price shows significant mark-up to the current Energy Price, so real price of energy is much higher than misleading lower energy only price
- High Zonal Prices in CT caused by wheeling power from Canada to NY

Main Route Causes for Problems

- Ten Offer Blocks
- Delayed State Estimator only input to Unit Dispatch Software and LMP Calculator
- Clearing Mechanism
- Negative Markets interaction (e.g. Regulation and Energy)
- Demonstration only Unit Performance Audits

Ten Offer Blocks

- Legalized Opportunity for Economic Withholding
- Large on-line ballast because of partial unit dispatch
- Higher heat rate and air pollution
- Unstable dispatch solution which jumps from one unit offer block to another unit

Clearing Mechanism

- Most of businesses use pay as bid approach
- Current clearing price approach along with ten offer blocks leads to unreasonably wide ranged prices, increasing process variation
- Zonal LMP approach helps partially localize high prices, but only because of congestion
- Pay as bid approach will allow to recover stranded costs and to have needed rate of return for the generators, lowering prices under competition
- Each unit should bid high enough for good profit margin, but low enough to win a competition

Goals for Quality Improvement

- Lower Process Variation (Market Volatility)
- Fair Market Design for Investment Recovery
- Reliable Dispatch based on the Latest Information
- Fuel Efficiency with Lower Heat Rate
- Cleaner Environment with Lower Air Pollution
- Market Transparency with easier Settlements
- Customer Satisfaction (less Call Tickets)

Solutions

- Limit number of offer blocks to two: zero – for self schedule contracts only, and positive – for the spot portion
- Implement pay as bid approach for Energy Market and pay for ancillary services by the same flat energy offer
- Apply regular statistical approach for Unit Performance Audits with Average Performance Rate instead of demonstration
- Set wholesale Energy Price to Weighted Average System Price instead of Marginal Uniform Price
- Let NY and PJM pay congestion uplift for CT caused by wheeling power