



THE UNIVERSITY OF HULL

Business School

# CONSTITUTION AND ECONOMIC MODELS FOR THE REPUBLIC OF NEPAL

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ASSOCIATION OF INDIAN ECONOMIC AND FINANCIAL STUDIES

<http://www.can.gov.np/>;

<http://www.cpnm.org/> ; <http://www.nepalicongress.org/> ; <http://www.cpnuml.org/>

[http://en.wikipedia.org/wiki/List\\_of\\_political\\_parties\\_in\\_Nepal](http://en.wikipedia.org/wiki/List_of_political_parties_in_Nepal) ,

<http://www.unmin.org.np/> ; <http://www.election.gov.np/EN/>

[http://www.cartercenter.org/news/pr/nepal\\_prelim\\_041208.html](http://www.cartercenter.org/news/pr/nepal_prelim_041208.html)

<http://www.eueomnepal.org/English/Core.html>

# Constitutional Development in Nepal

- Medieval period 22/23 kingdoms (Manusmriti)
- 1768: Formation of Nepal (under the leadership of PN Shah from Gorkha)
- 1846: Kot Massacre and beginning of of 104 year dictatorial Rana Rule
- 1947 Constitution of Government of Nepal
- 1951 Interim Constitution of Nepal
- 1959 : Royal Constitution of Nepal
- 1962: Panchayat Constitution of Nepal
- 1990 : Constitution of Kingdom of Nepal
- 2007: Interim Constitution of Nepal
- 2008: Constituent Assembly (From People)
- 2010: Constitution of Nepal??

## **Conflict and Coalition: Successes and Failure**

- Parliamentary Democracy and constitutional monarchy under 1990 Constitution.
- Maoists' Underground People War since 1996.
- No peace deal with the Maoists. 2001 massacre.
- Political Instability; 13000 people died in the Maoist Movement.
- King imposed emergency rule and became a dictator in 2005 by dissolving the elected government and the parliament as in 1961.
- Maoist crises worsened. Political parties also came against the King.
- Abolition of absolute monarchy required cooperation of all parties. Seven Party Alliance (SPA) and the Maoists signed 12 point agreement in November 2005 concurred in New Delhi.
- This brought successful April 2006 Revolution. King gave up power. House was reinstated; Power transferred from the King to the Parliament; Coalition government formed under the Premiership of GP Koirala bringing Maoists in the mainstream.
- UN peace Mission. Maoists arms in cantonements and Maoist armies put in temporary camps. Maoists promised to return captured properties and dissolve the parallel government.
- This was a big democratic achievement for the time being.
- Government of seven party drafted a interim constitution 2007 for the election of Constituent Assembly.
- Emergence of regional and ethnic organisations and issues

## **Election of the Constituent Assembly: Short-lived Cooperation?**

- Election of constituent Assembly of Nepal May 5, 2008.
- Maoist emerged major party with 38% of votes; NC 19% ; UML 18% and MPRF 9% , TMLK 5.5% and Other Parties 12%.
- Nepal was declared Federal Republic Unanimously on May 28, 2008; King was forced to leave palace on June 15, 2008. Palace turned into a museum.
- President (NC) and Vice Presidents (TPRF) and Speaker (UML).  
Maoists led Cabinet under the Premiership of Pushpa Kamal Dahal.
- Coalition gradually weakened and contradictions in interests emerged.
- Maoists have not returned properties seized during people's war, have not completely dissolved the parallel government and demanding integration the 19000 People's Liberation Army into the regular Army.
- Parties without guns and armies are intimidated of dictatorship.
- Maoists fired COAS on May 4, 2009; coalition partners withdrew support and Maoist resigned from the government as they became minority.
- New Coalition of 22 parties; Communication with Maoists has broken
- Protests from street and parliaments; strikes, bandhas and blockades continue.

## Members of Constituent Assembly by Political Parties in Nepal: Result of April 2008 Election of CA

|                                | Total | Maoist | NC    | UML   | MPRF | TMLP | Others |
|--------------------------------|-------|--------|-------|-------|------|------|--------|
| Total                          | 601   | 229    | 115   | 108   | 54   | 21   | 74     |
| First Past The Post<br>(FPTP)  | 240   | 120    | 37    | 33    | 30   | 9    | 11     |
| Proportional<br>Representation | 335   | 100    | 73    | 70    | 22   | 11   | 59     |
| Nomination                     | 26    | 9      | 5     | 5     | 2    | 1    | 4      |
| Percentage of each<br>party    | 100%  | 38.1%  | 19.1% | 18.0% | 9.0% | 3.5% | 12.3%  |

Data source: Election Commission of Nepal, MAY 2008

<http://www.election.gov.np/EN/>

## Current Nepali Dilemma

Why Communication broke down??

Narrow vision

Irreconcilable political ideologies. NC, UML and other Parties think that

- Maoists objective is to establish totalitarian dictatorial government with complete control of Army
- Maoist strategy: Protracted War, Alliance, Popular support and Total capture on power; Totalitarian rule

- Maoist consider other parties
  - Remote controlled by foreign powers
  - Out of touch of the common people
- Conflict continues; Will Nepal enter another civil war?? Big crisis

No Solution without Cooperation for

- Economic growth
- Alleviation of Poverty
- Note
  - Too big task for one: none of the parties are pivotal
  - NC, CPN (M), CPN (UML) and MPRF/TMLP need support of each other
  - Gains from Cooperation are much higher than from the conflict
- Do not forget 2006??

Will Constitution of Nepal be passed by May 2010??

# Spirit for the Constitution for the Republic of Nepal 2010

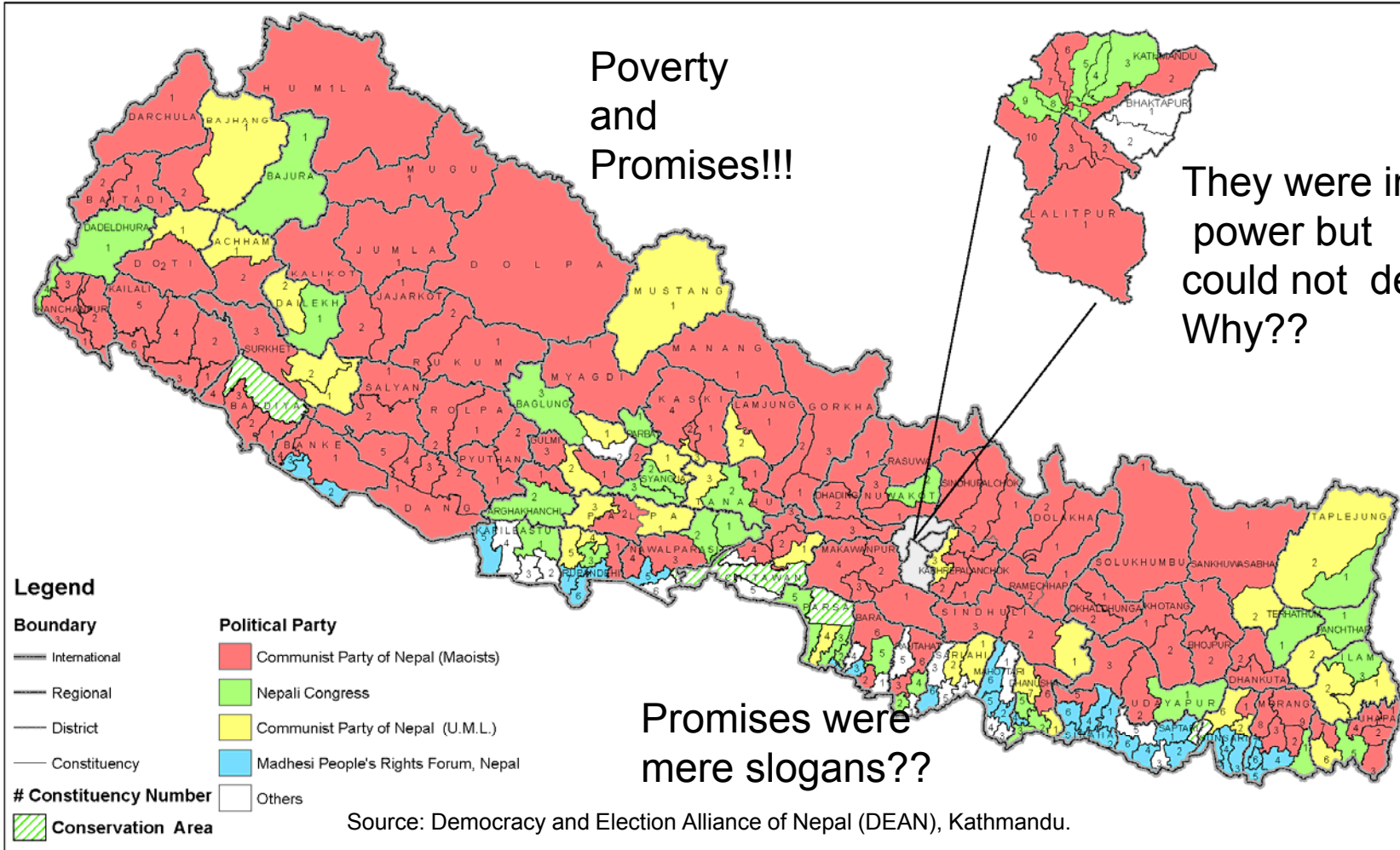
- Magna Carta (1215)
- 1689 Bill of rights
- Constitution of United States
- Bill of rights of United States
- French Declaration of the rights of man and the citizen (1789)
- Canadian Charter of rights and freedom 1867
- Universal Declaration of Human Rights – United Nations
- Constitution of India
- Constitution of China
- Basic Law of Federal Republic of Germany 1949
- UN Convention against Genocide
- UN Covenant on Economic, Social and Cultural Rights
- UN Convention Against Torture
- UN Covenant on Civil and Political Rights

# Why People voted Maoists Overwhelmingly in the Elections for CA???

## Nepal Constituency Map of Elected First Past the Post Candidates by Party

Nepal Constituent Assembly Election Results 2008

As declared by the Election Commission 2008-04-25 14:00



Poverty and Promises!!!

They were in power but could not deliver. Why??

Promises were mere slogans??

[www.nepalelectionportal.org](http://www.nepalelectionportal.org)

Success of protracted war and alliance strategy??

# Why Other Political Parties and India are Afraid of Maoists in Nepal?

Main Issues:

Grow fast

Eliminate poverty

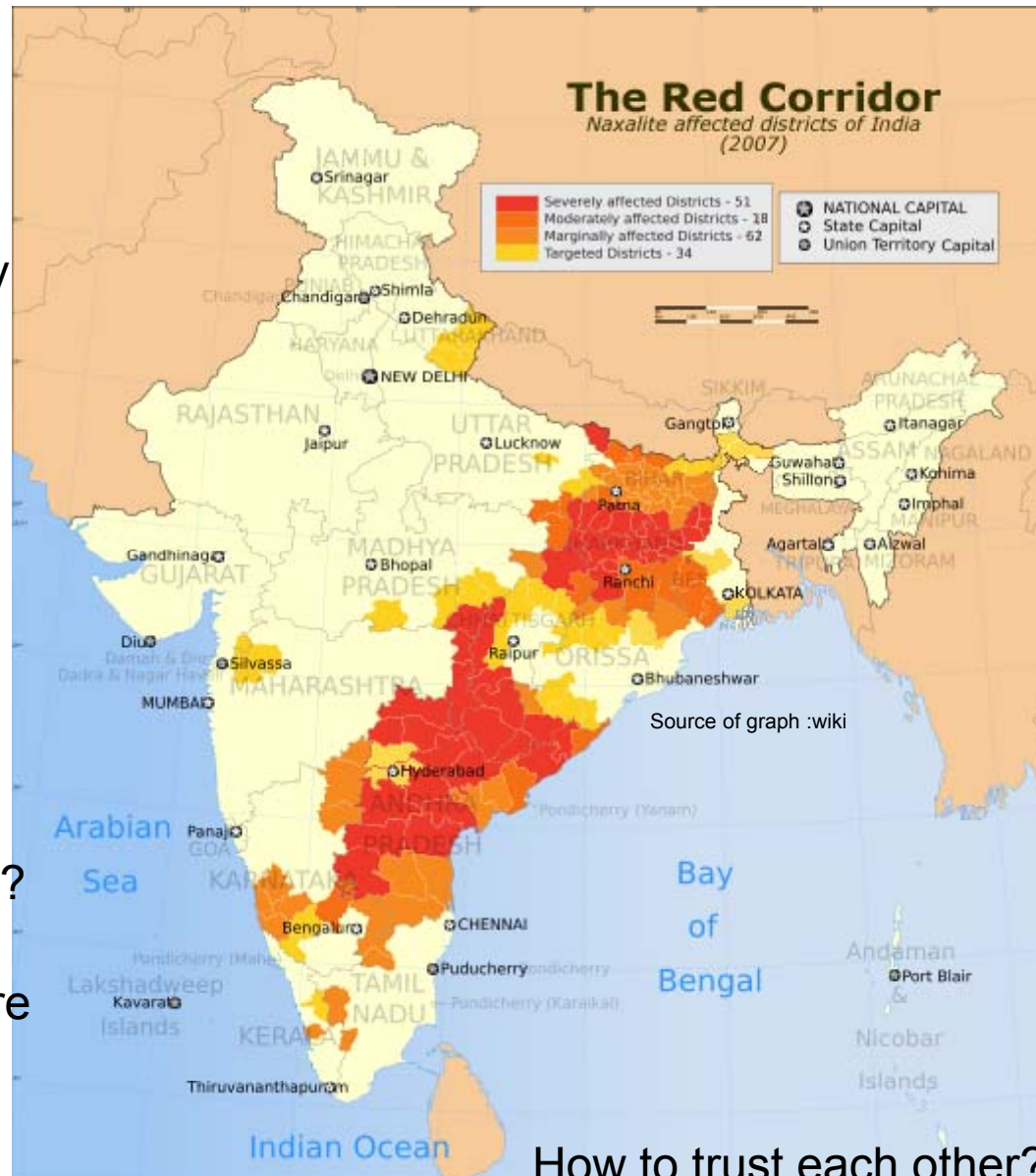
Rule of Law

No corruption

Value of life

What is the option from other parties??

Common people are fed up.



Communism exists only in theories

People are motivated by system of rewards for good acts and punishment for bad.

Equal opportunities through education

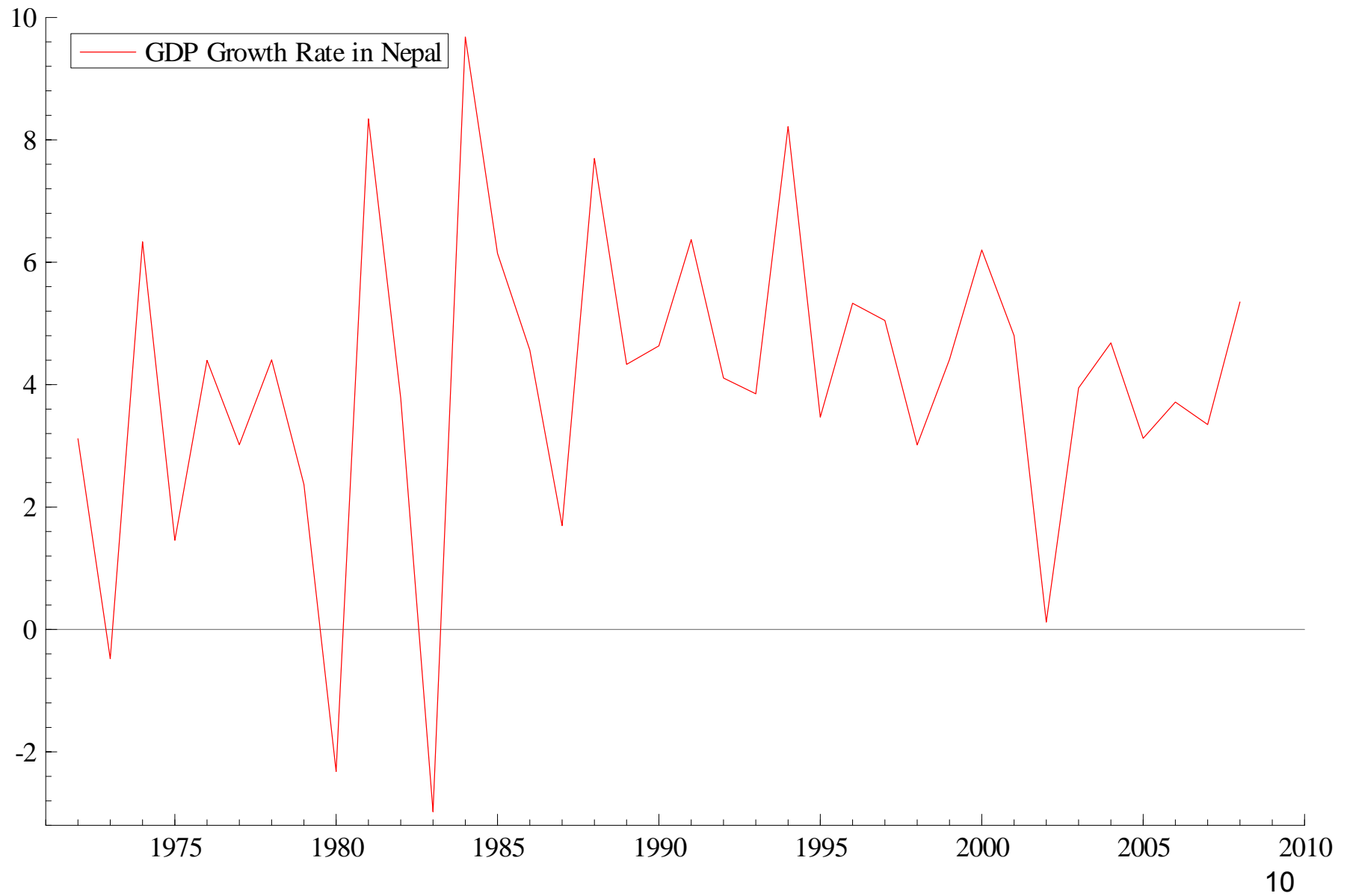
None delivering.

All same.

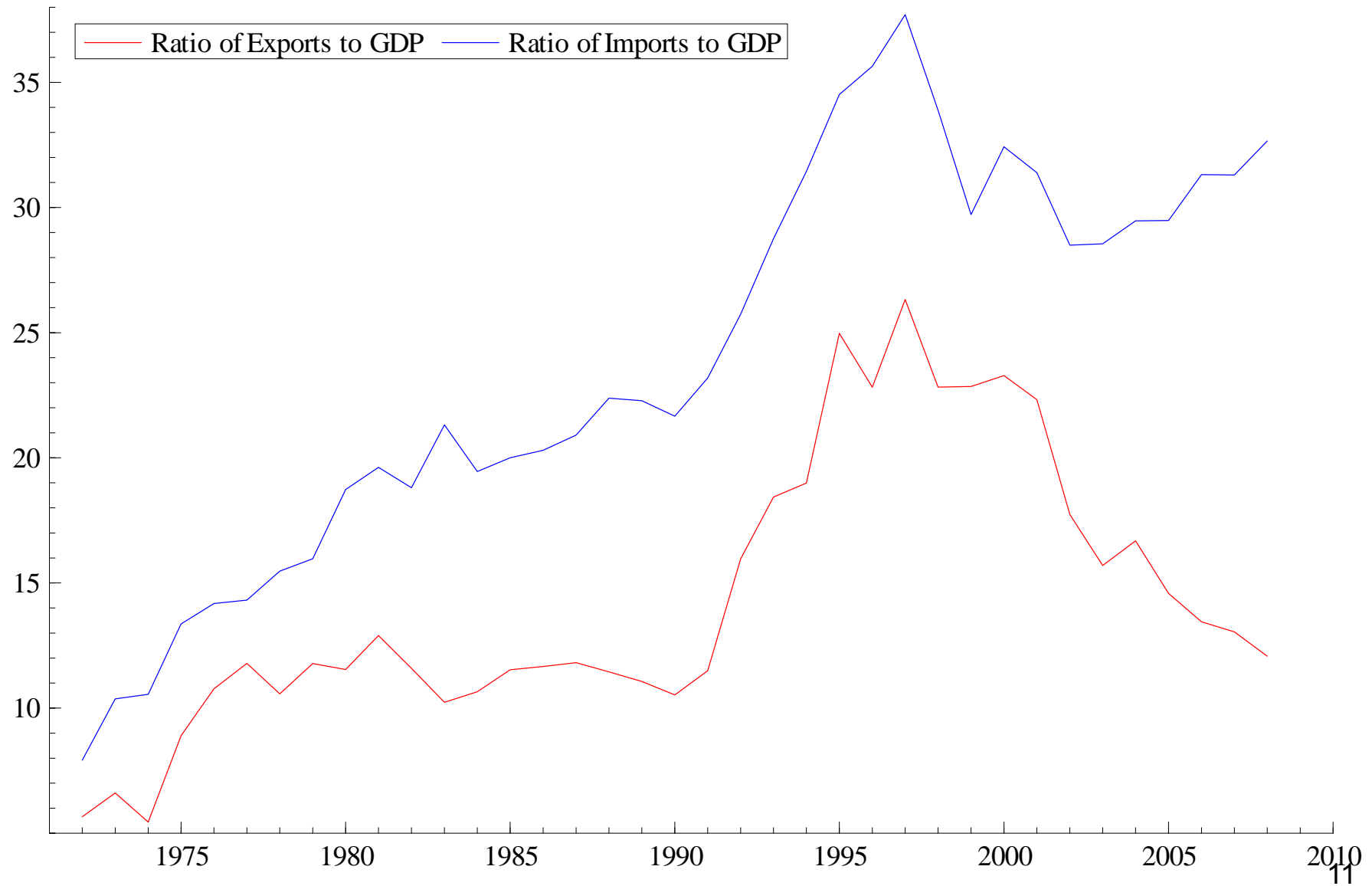
How to trust each other??

Good mechanism from top to the bottom requires honesty of words and actions

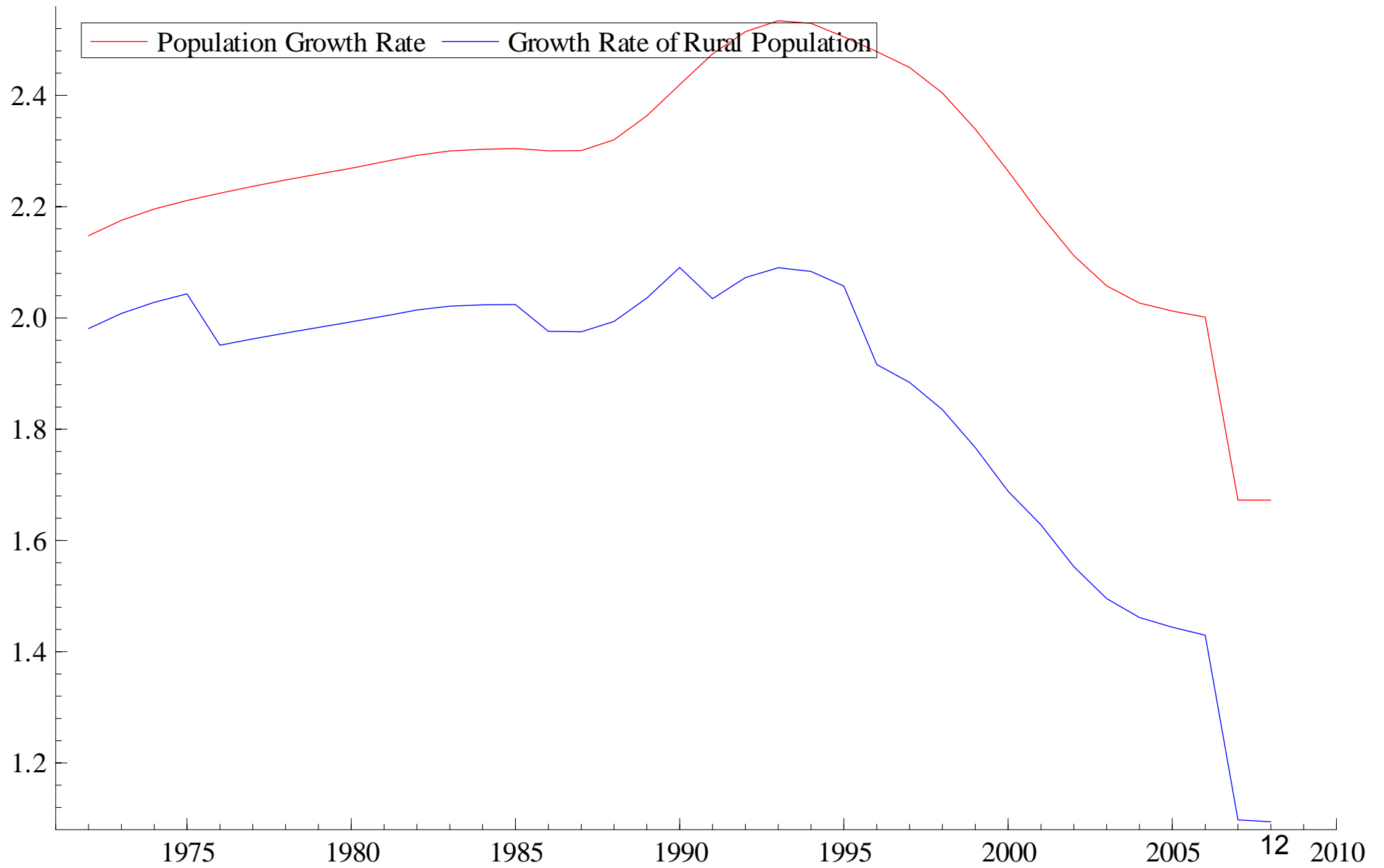
# Consequences of Bloody Civil War -1



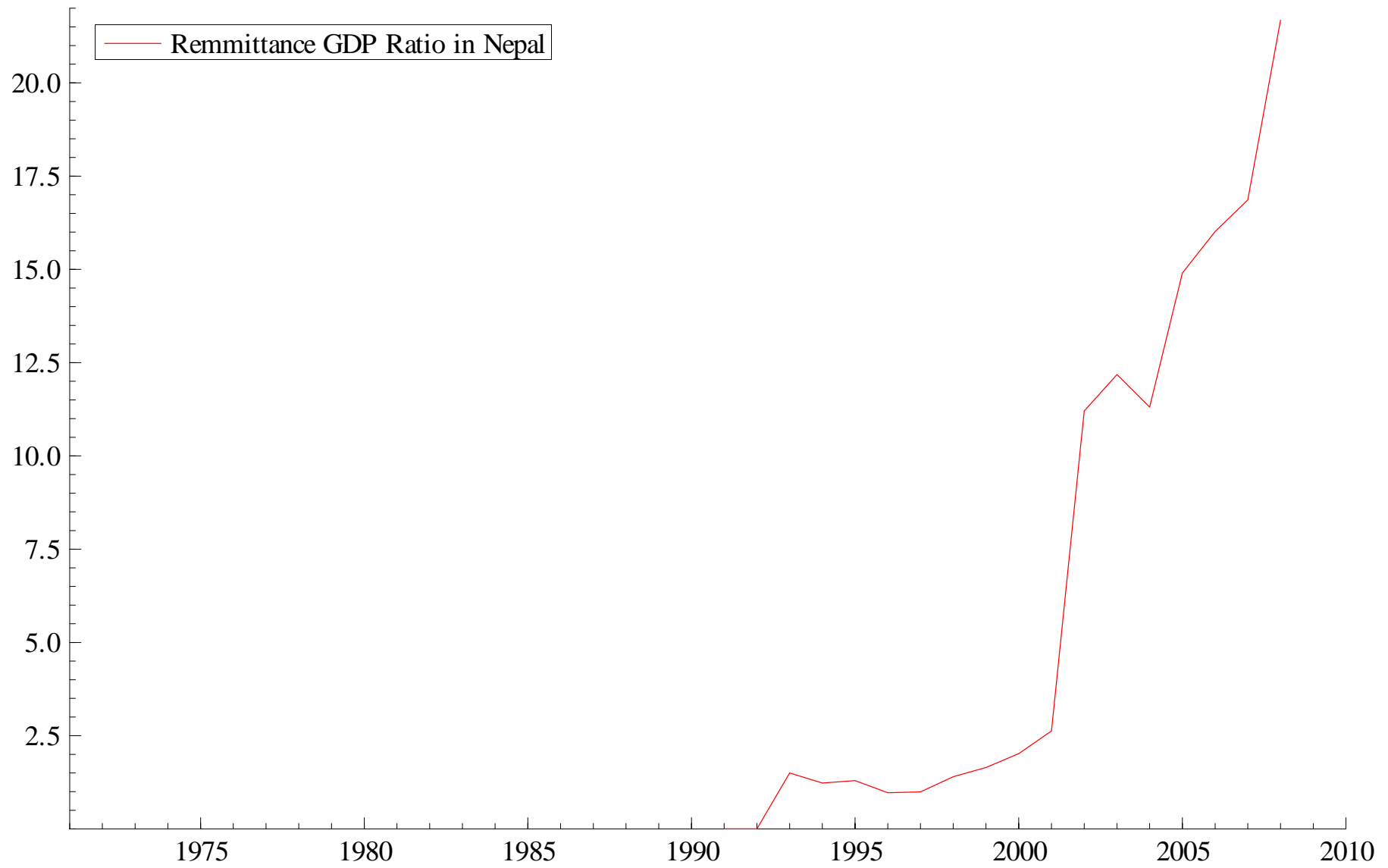
## Consequences of Bloody Civil War -2



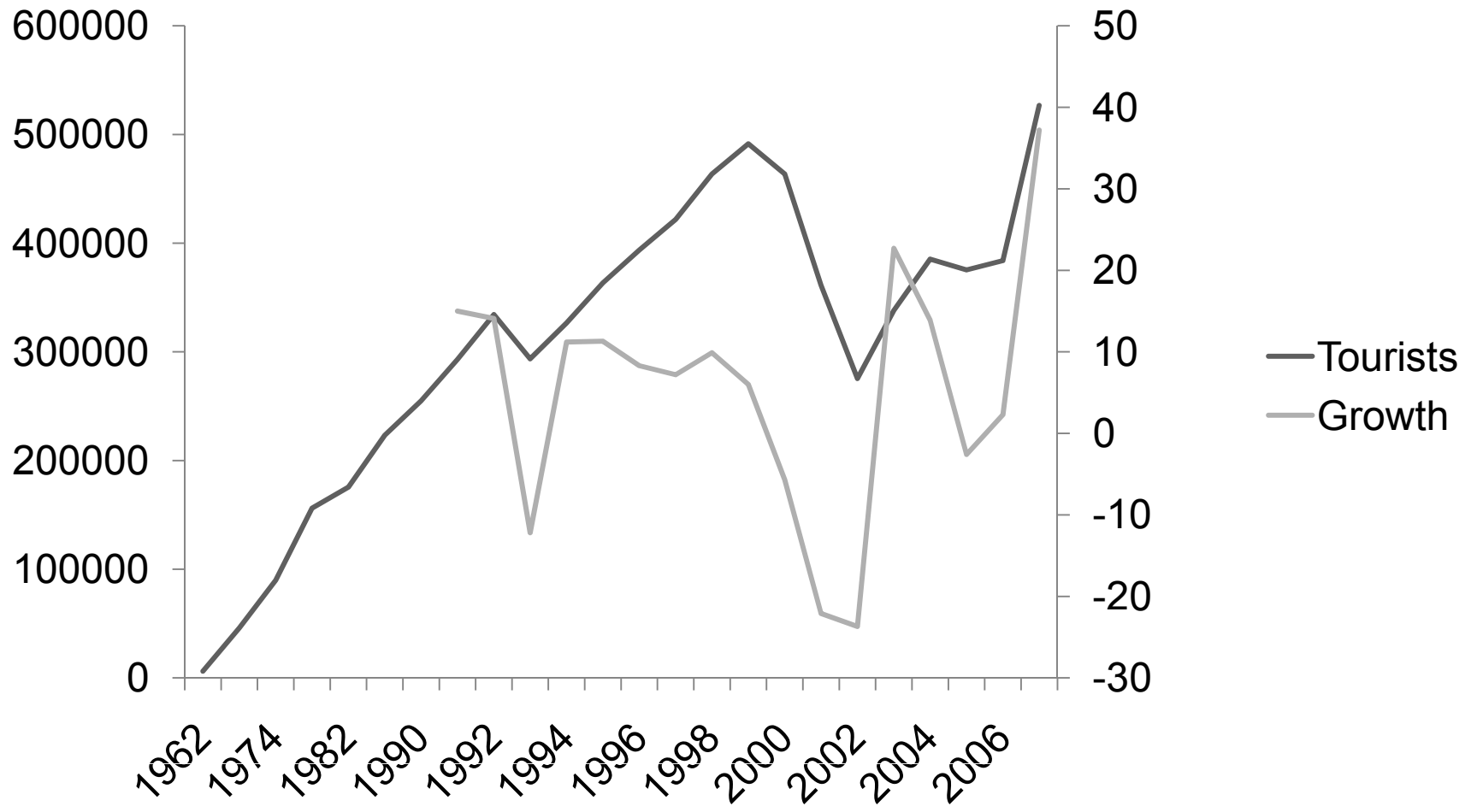
# Consequences of Bloody Civil War -3



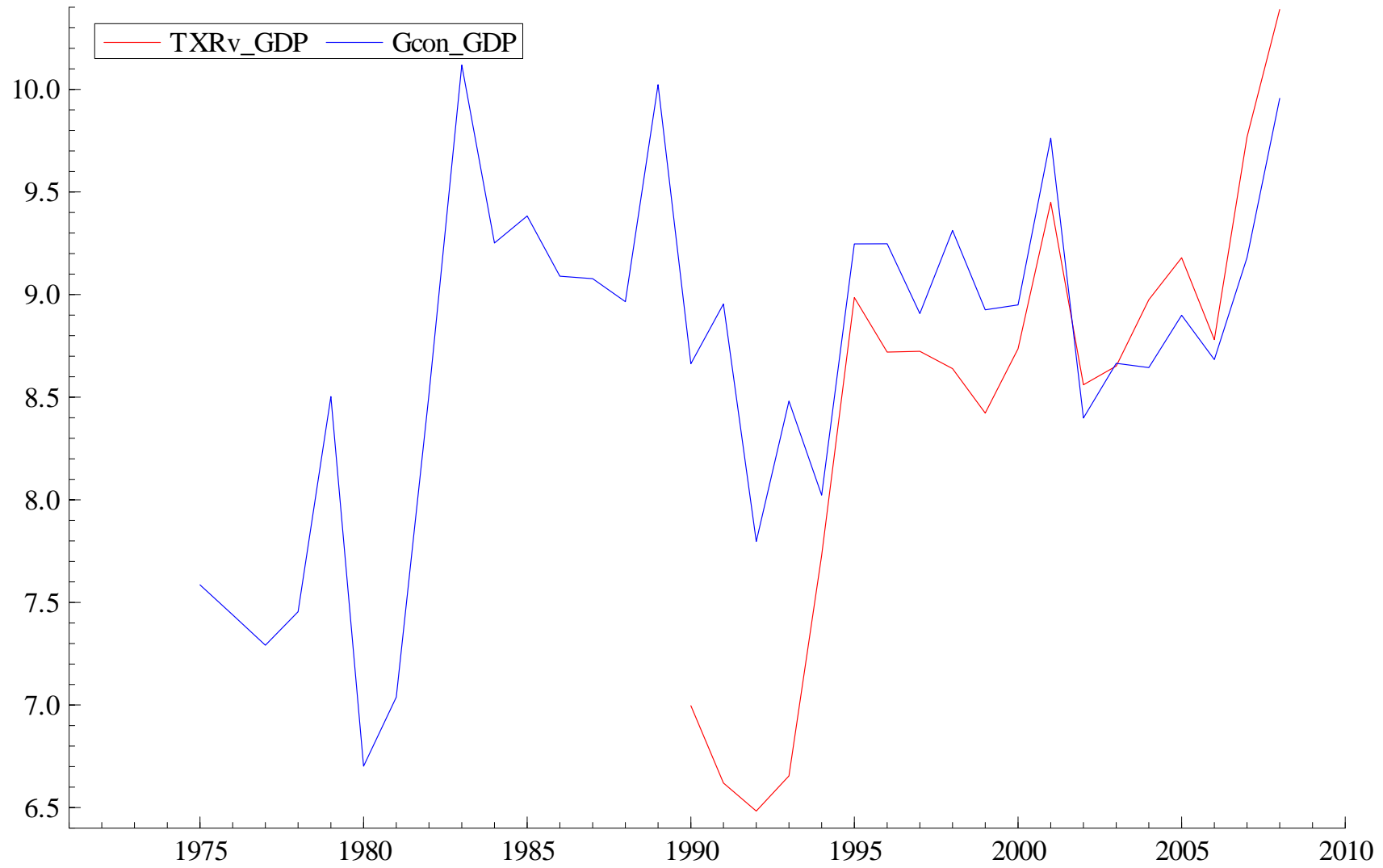
## Consequences of Bloody Civil War -4



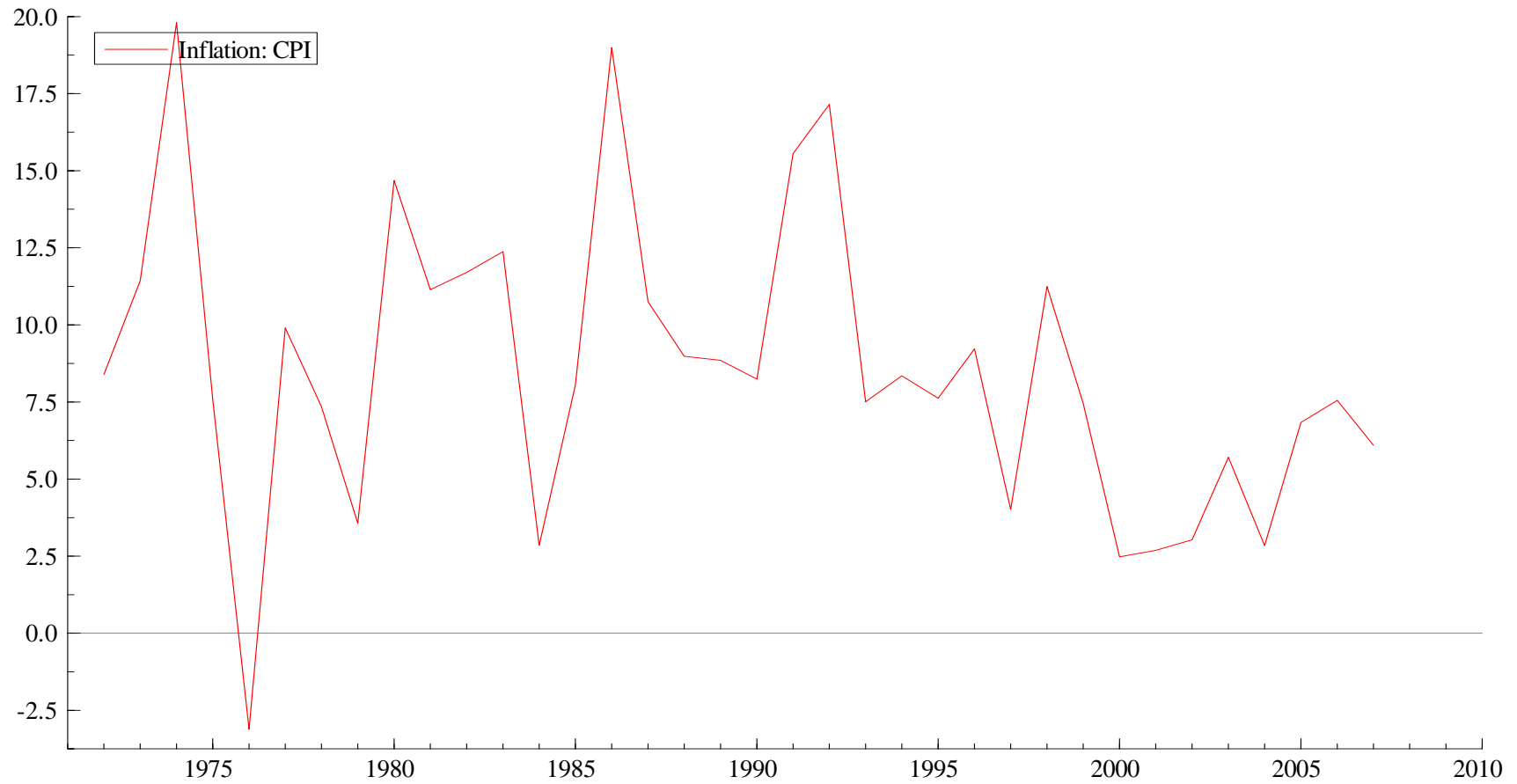
## Tourist Arrival and Its Growth Rate



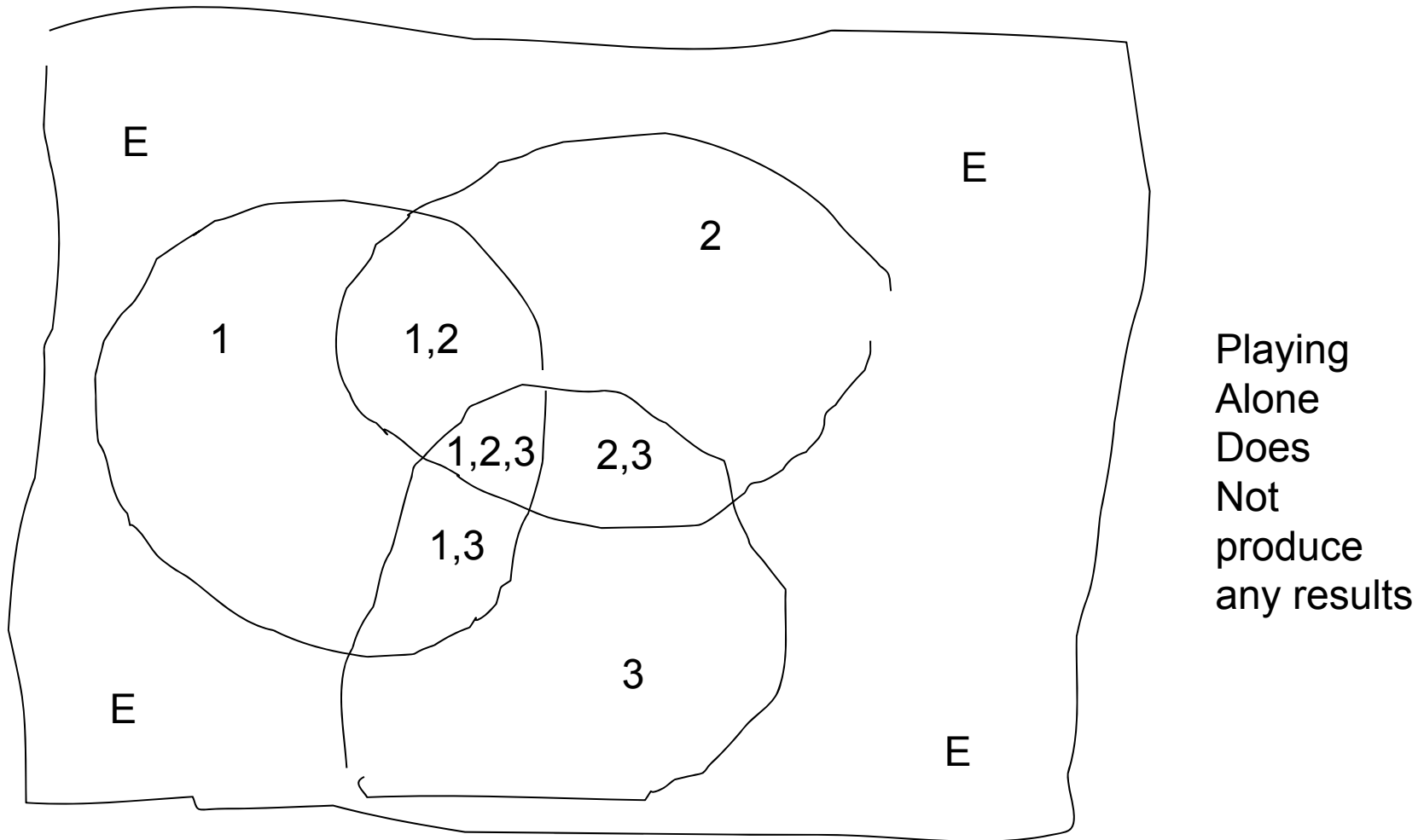
# Consequences of Bloody Civil War -5



## Consequences of Bloody Civil War -6



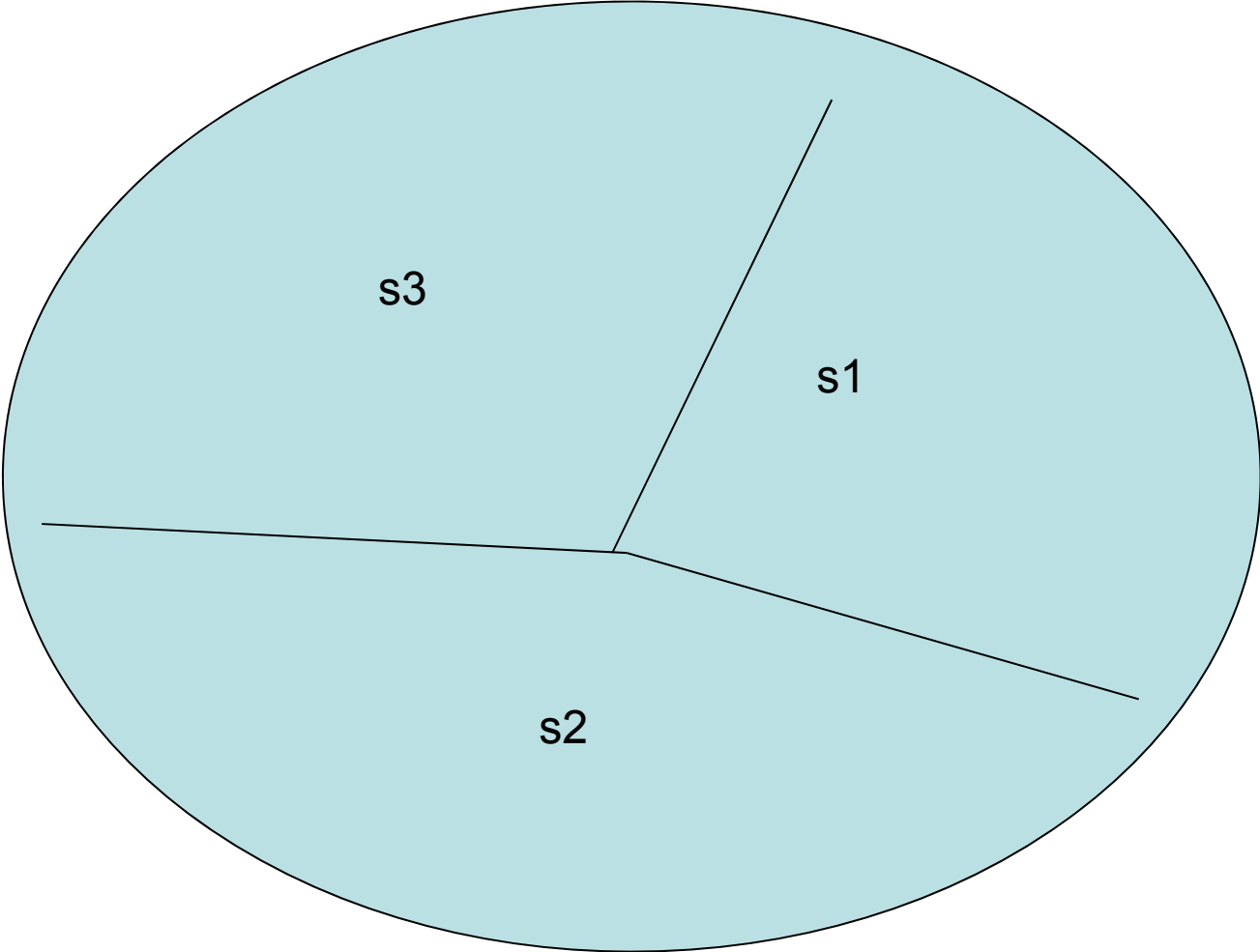
## Solution: Find a Core Point (1,2,3) that satisfies all



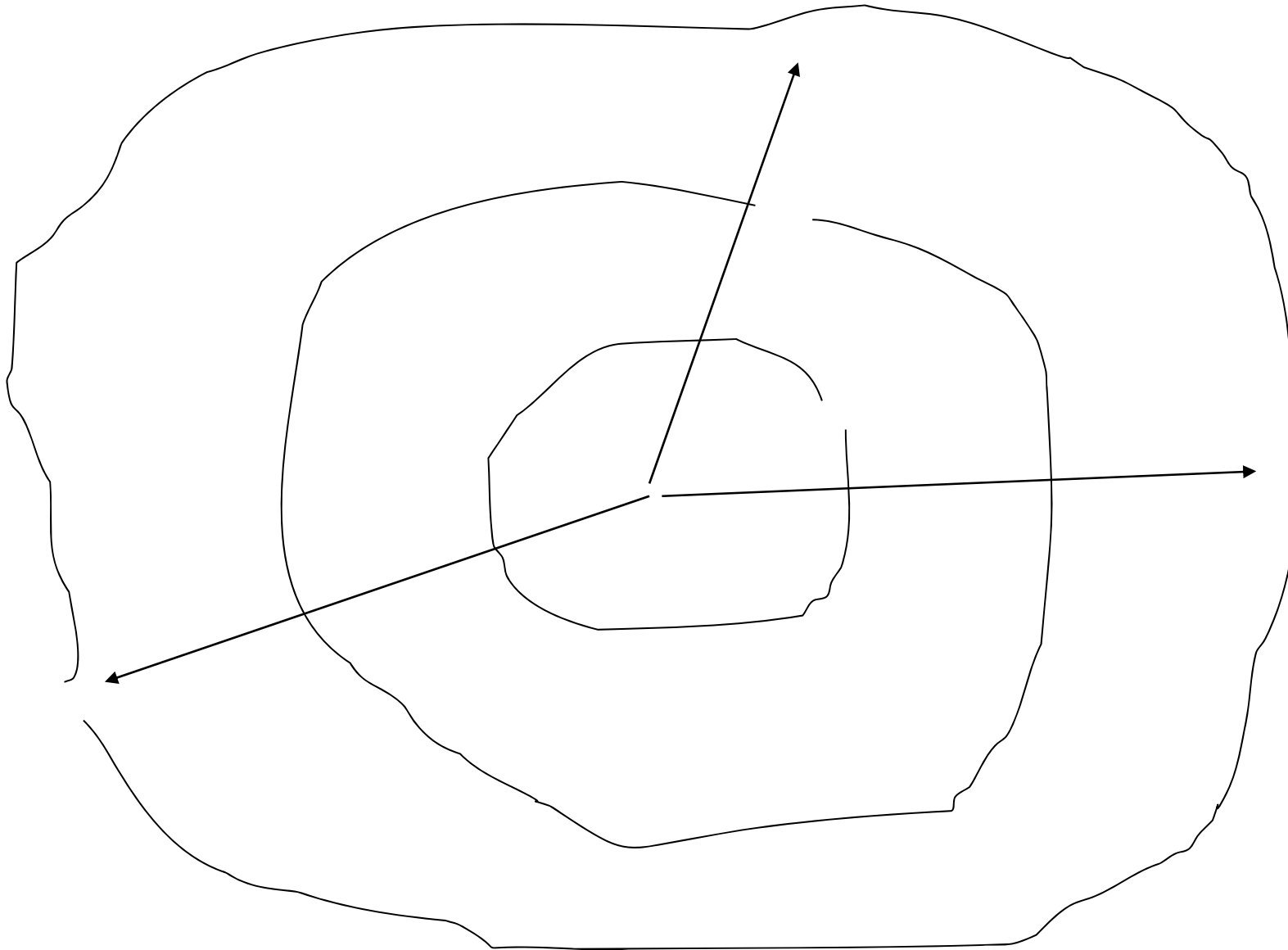
(1,2,3) is elimination of poverty and higher economic growth.

**Shapley Shubik Core in a Venn Diagram**

# Short -sighted Myopic view of zero Sum Game



# Far-sighted view of growth and development



# Grow Nepal Contract

1. Rule of law
2. Equality by means of education and training
3. Creativity and productivity through competitive system
4. Transparency in use of public funds
5. Strengthen laws for property rights, saving and investment
6. Liberal tax and transfer system for growth with redistribution
7. Eliminate corruption
8. Encourage entrepreneurs, minimise blockage and extortion
9. Respect individual freedom and opinions of others
10. Open up for trade, FDI and Technological Transfer
11. Formulate economic policies based on scientific modelling
12. Peaceful means for resolution of conflict of interests

## Value Of Playing In A Coalition Is Greater Than From Playing Alone

$$v(1 \cup 2 \cup 3) \geq v(1) + v(2) + v(3)$$

$$v(i) = 0$$

$$v(N) = 1$$

$$i = \{1, 2, \dots, N\}$$

Three players in the current Nepalese context  
 $N = (1 = \text{CPM and } 2 = \text{UML, } 3 = \text{NC})$ .

## Possible coalitions

Singletons

$\{NC\}$   $\{UML\}$   $\{CPN(M)\}$   $\{Others\}$

Intermediate coalition  $\{NC, CPN(M)\}$

$\{NC, UML\}$   $\{UML, CPN(M)\}$

Grand coalition: Democratic system

$\{NC, UML, CPN(M), others\}$

# Lessons from a GAME of a Pivotal Status

- Ability of a player to influence the outcome of the game depends on the pivotal status enjoyed by that player.
- In a game with 3 players; power of player  $i$  is reflected by its Shapley value.
- Consider six possible ordering of 123 pivotal game. Three players can order themselves in  $3! = 6$  ways.
- Each of these number can appear only twice in the middle out of six possible combinations.
- A player located in the middle is pivotal.
- If parties realise this fact while bargaining, such bargaining is likely to generate a stable and cooperative solution.
- In the 123 game given in Table 1 the player 3 is pivotal in game (2) and (4); player 1 in (3) and (5) and player 2 in (1) and (6).

# Reality: No One is Pivotal

## I. The 123 Game with Rotating Pivotal Party

| Orderings   | M(1,S) | M(2,S) | M(3,S) |
|-------------|--------|--------|--------|
| (1). 123    | 0      | 1      | 0      |
| (2). 132    | 0      | 0      | 1      |
| (3). 213    | 1      | 0      | 0      |
| (4). 231    | 0      | 0      | 1      |
| (5). 312    | 1      | 0      | 0      |
| (6). 321    | 0      | 1      | 0      |
| Shapley (i) | 2/6    | 2/6    | 2/6    |

- Therefore each player has 1/3 chance of being pivotal.
- There is always a chance that a pivotal player now may have to give up that position for other players later on.
- If one party does not solve the problem it is opportunity for another.

# Each Party want to be a Dominant Player

## II. The 123 Game with only one Pivotal Party

| Orderings   | M(1,S)    | M(2,S)    | M(3,S)    |
|-------------|-----------|-----------|-----------|
| (1). 123    | 1         | 0         | 0         |
| (2). 132    | 1         | 0         | 0         |
| (3). 213    | 1         | 0         | 0         |
| (4). 231    | 1         | 0         | 0         |
| (5). 312    | 1         | 0         | 0         |
| (6). 321    | 1         | 0         | 0         |
| Shapley (i) | $6/6 = 1$ | $0/6 = 0$ | $0/6 = 0$ |

- In a democracy parties make mistake when they assume that they can be pivotal all the times.
- Only a dictator can dream of being pivotal like above.
- Maoists are seen in this way by other parties unless they stick to Comprehensive Peace Agreement.
- Cooperation and cooperation fulfils all conditions of rationality in the current context

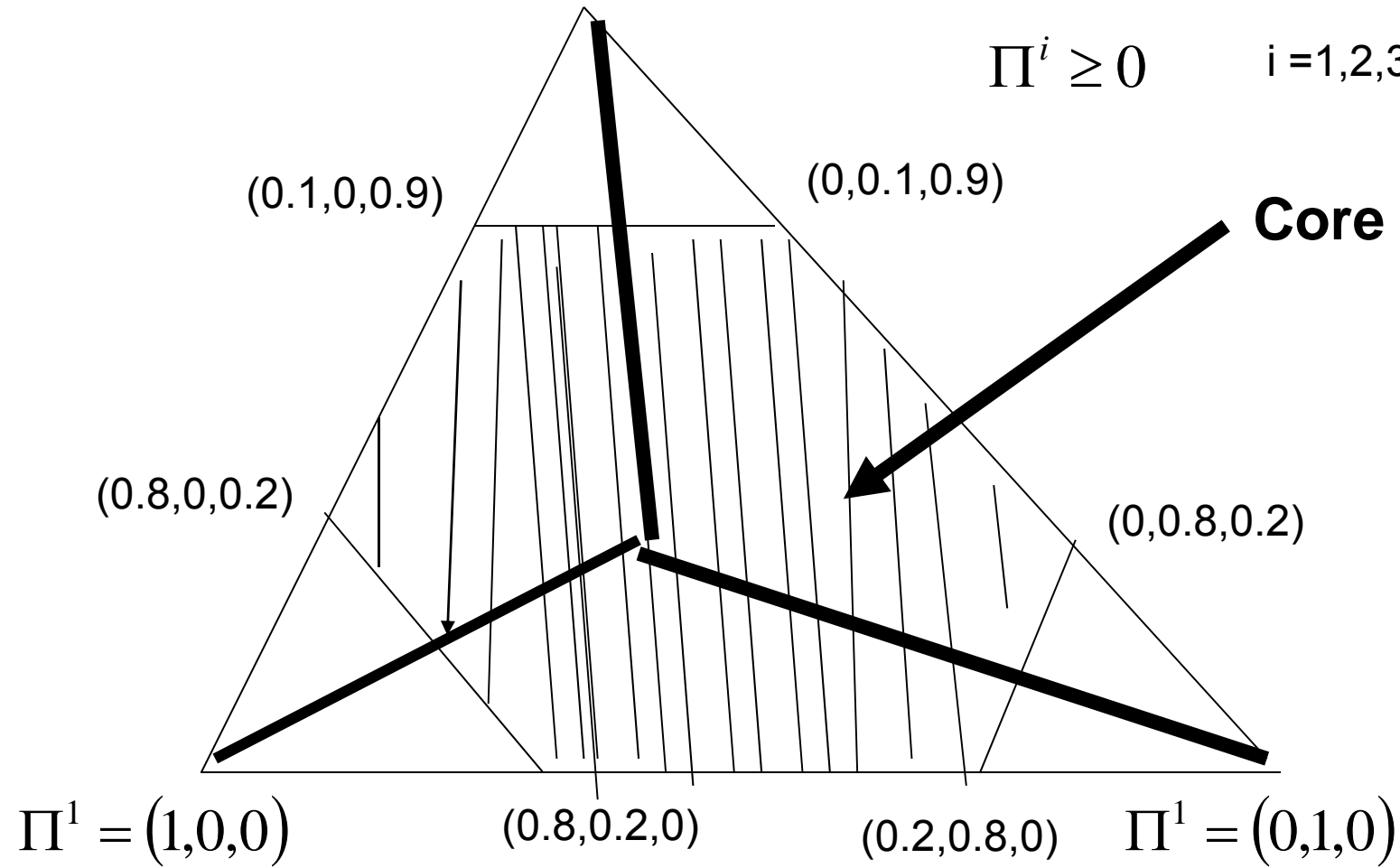
# Shapley Values of the Game

Core in a Three Player Game has no blocking coalition

$$\Pi^1 = (0,0,1)$$

$$\Pi^1 + \Pi^2 + \Pi^3 = 1$$

$$\Pi^i \geq 0 \quad i=1,2,3$$



$\Pi_j^i \geq 0$  Imputations should satisfy individual, group and coalition rationality.

# Right Use of Signals for Coordination

- Interpreting signals correctly and translating them into actions more accurately brings success;
- 
- Sending wrong signals or interpreting them incorrectly is a recipe of failure.
- Status of player  $i$ , , is stochastic and depends on ability of signal extraction and information set .
- 
- Popular media and public institutions and policies (such as the UN in Nepal, Carter Center for Nepal) can contribute significantly in gathering and analysing this information which can influence productivity players, communities and the economy and nation as a whole.
- 
- In general the proper use of signalling improves the natural intelligence of these agents which results in good decisions, better actions and peace and prosperity at home and abroad.
- 
- Cultural values can be used to form right signals required for the peace and prosperity.

## Democratic Mechanism for Coordination

- **Asymmetric Information: Moral Hazard and Adverse Selection**
- People as principal want good public services from agents which are the political parties.
- They enter in power contract to match promises and efforts.
- Political leaders know their intention but people do not.
- People have idea on distribution of quality of political parties  $F(s)$ , where  $s$  denotes either good or bad party such as probability of observing good party is 0.5 and of bad 0.5.
- People as principal offer power contract in terms of time to agents.
- Parties accept or reject this contract based on self-selection and participation constraints.
- Monitoring of performance by election. Renew contract if principals are happy. Offer contract to another party if they fail. If none are trusted force them to cooperate.

# Game of Poverty Alleviation Requires Cooperation from All

Poor, rich and government strategy profiles = (s,l,k,)

State contingent income of rich  $y_t^P (s, l, k)$

State contingent income of poor  $y_t^R (s, l, k)$

Probability of being rich  $\pi_t^P (s, l, k)$

Probability of being poor  $\pi_t^R (s, l, k)$

Proposition 1: The state contingent money metric utility of poor is less than that of rich

$$\sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^P(s, l, k) \cdot \delta_t^P u(y_t^P(s, l, k)) < \sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^R(s, l, k) \cdot \delta_t^R u(y_t^R(s, l, k))$$

Proposition 2: Transfer raises money metric expected utility of poor and reduces the utility of rich

$$\sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^P(s, l, k) \cdot \delta_t^P u(y_t^P(s, l, k) + T_t^P(s, l, k)) < \sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^R(s, l, k) \cdot \delta_t^R u(y_t^R(s, l, k) - T_t^P(s, l, k))$$

Condition 3: Incentive compatibility requires

$$\sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^P(s, l, k) \cdot \delta_t^P u(y_t^P(s, l, k) + T_t^P(s, l, k)) > \sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^P(s, l, k) \cdot \delta_t^P u(y_t^P(s, l, k))$$

$$\sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^R(s, l, k) \cdot \delta_t^R u(y_t^R(s, l, k) - T_t^P(s, l, k)) < \sum_{s=1}^s \sum_{l=1}^l \sum_{k=1}^k \sum_t^T \pi_t^R(s, l, k) \cdot \delta_t^R u(y_t^R(s, l, k))$$

Condition 4: Growth requires that income of both poor and rich are rising over time

$$T_t^P(s, l, k) < T_{t+1}^P(s, l, k) < T_{t+2}^P(s, l, k) < \dots < T_{t+T}^P(s, l, k)$$

$$Y_t^P(s, l, k) < Y_{t+1}^P(s, l, k) < Y_{t+2}^P(s, l, k) < \dots < Y_{t+T}^P(s, l, k)$$

$$Y_t^R(s, l, k) < Y_{t+1}^R(s, l, k) < Y_{t+2}^R(s, l, k) < \dots < Y_{t+T}^R(s, l, k)$$

State contingent poverty line:

$$Y_{t+T}^P(s, l, k) \geq \frac{1}{2} \sum_{p=1}^p Y_{t+T}^P(s, l, k)$$

# Three Models of Nepalese Economy

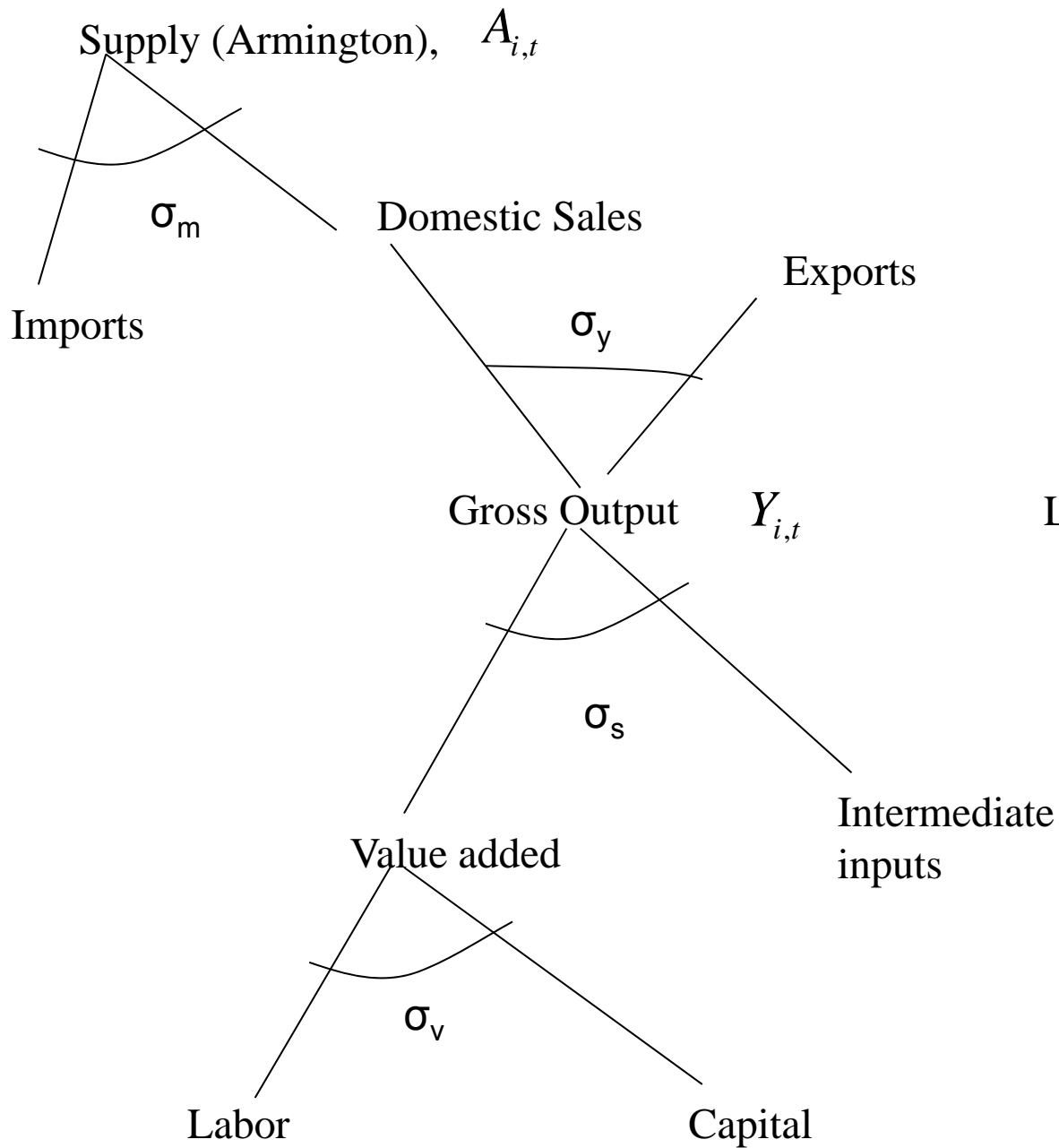
- Political Economic Model of Conflict and growth
  - Cooperative game and gains from bargaining
  - Mixed strategies
  - Signalling and incentive mechanism
  - Poverty Game
- Dynamic Multisectoral General Equilibrium Model
  - Model of efficiency, growth with redistribution
- Macro econometric Model of Forecasting
  - Short run forecasting

# Poverty in a Multi-sectoral multi-household dynamic general equilibrium model of Nepal

- ten different households, ...
- ranked according to their income status,
- 9 different firms ...,
- The growth of the economy and distribution of income among households depends on the capital accumulation process
- growth rate of productivity of labour force
- a government that uses taxes and spending strategy to alleviate the depth of poverty
- The steady equilibrium growth path of the economy is determined in terms of the interest rate,
  - discount factor and relative prices of goods and factors
  - in which the excess demand for goods and factors are eliminated and resource balance condition holds for the economy and
  - each household and the government and rest of the world sectors
  - in each period and over the model horizon

## Market Structure

- Prices of commodities and services and factors of production continue to adjust until the demand and supply are balanced in each market.
- Model has eleven categories of goods and services, capital assets differentiated by sectors, labour differentiated by skills.
- Each economy is linked to the rest of the world for trade with the real exchange rate between domestic and foreign sectors determining the flow of imports and exports.



Dynamic Analysis

↓

Law of capital accumulation

and

Investment by origin and destination

and

Steady state and Transitional dynamics

# Dynamic GE Model of Redistribution and Growth

- Consumption
  - 10 categories of representative household
  - Investor
  - Trader
  - Government
- Labour-leisure choice and labour supply

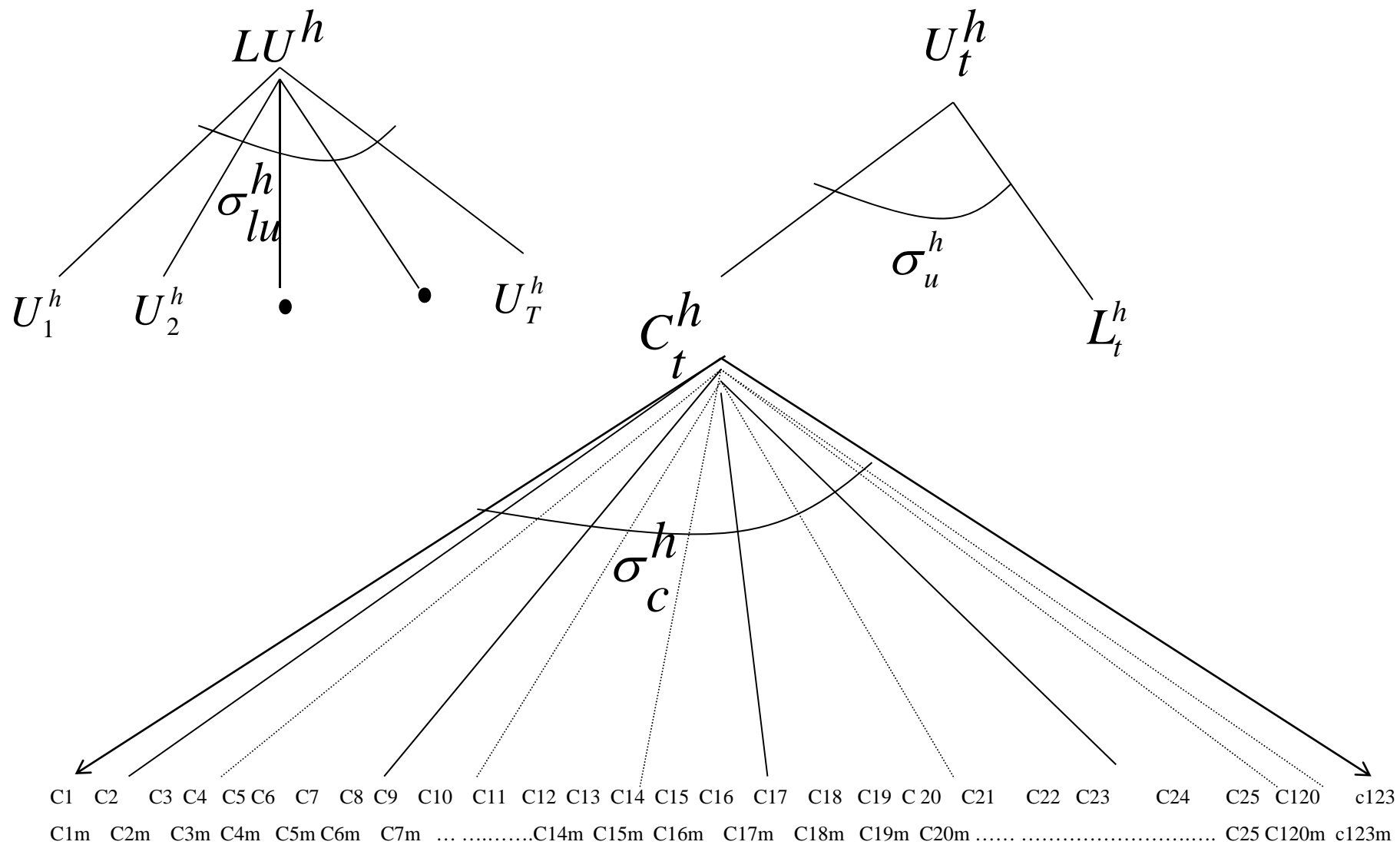
- Production
  - Capital
  - Labour
  - Technology
  - Input-output structure

Nested functions

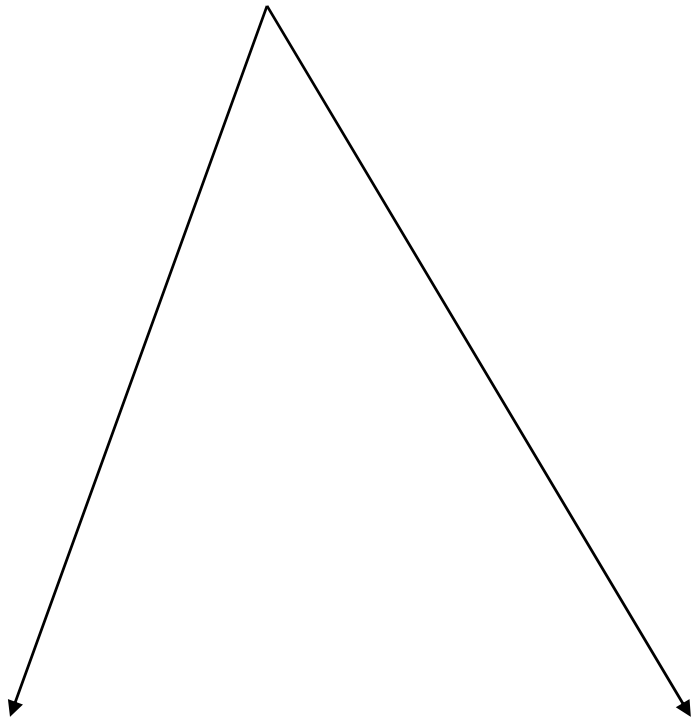
Price based substitutions

Separate models with  
nine, eleven, 16, 21  
and 123 sectors

# Lifetime and Instantaneous Utility Function of a Household in the BHI CGE Model



Time Endowment of Household H

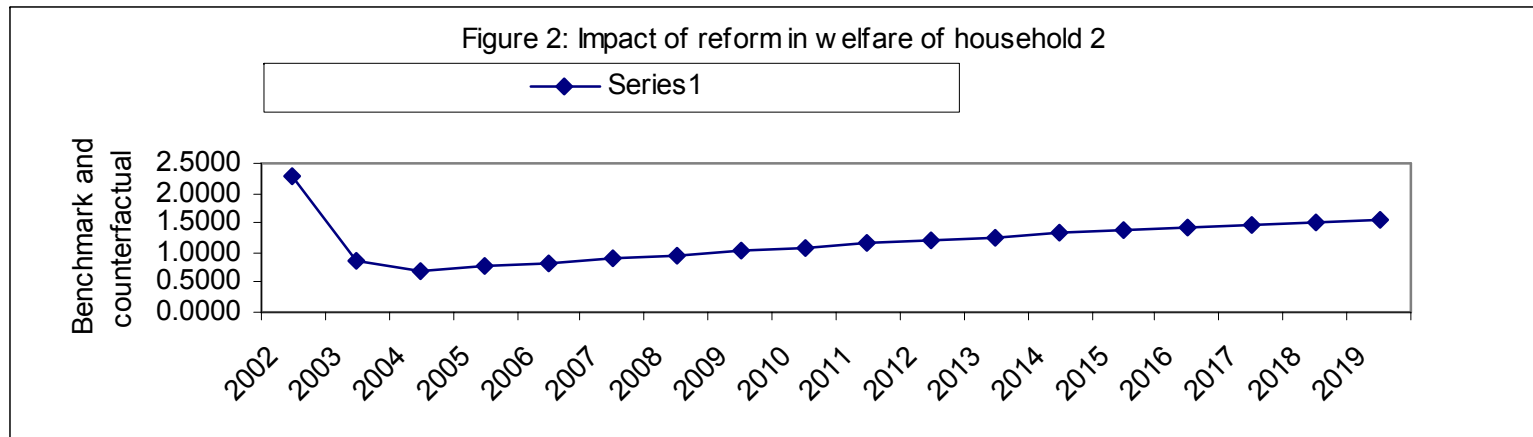
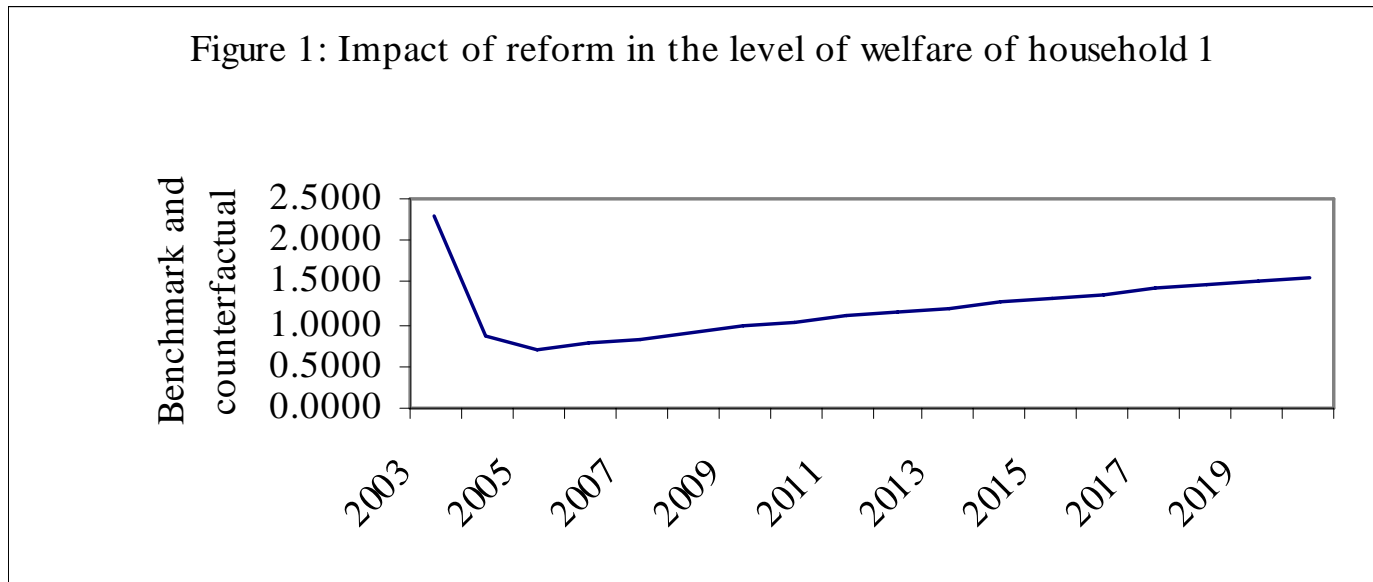


Leisure of Household h

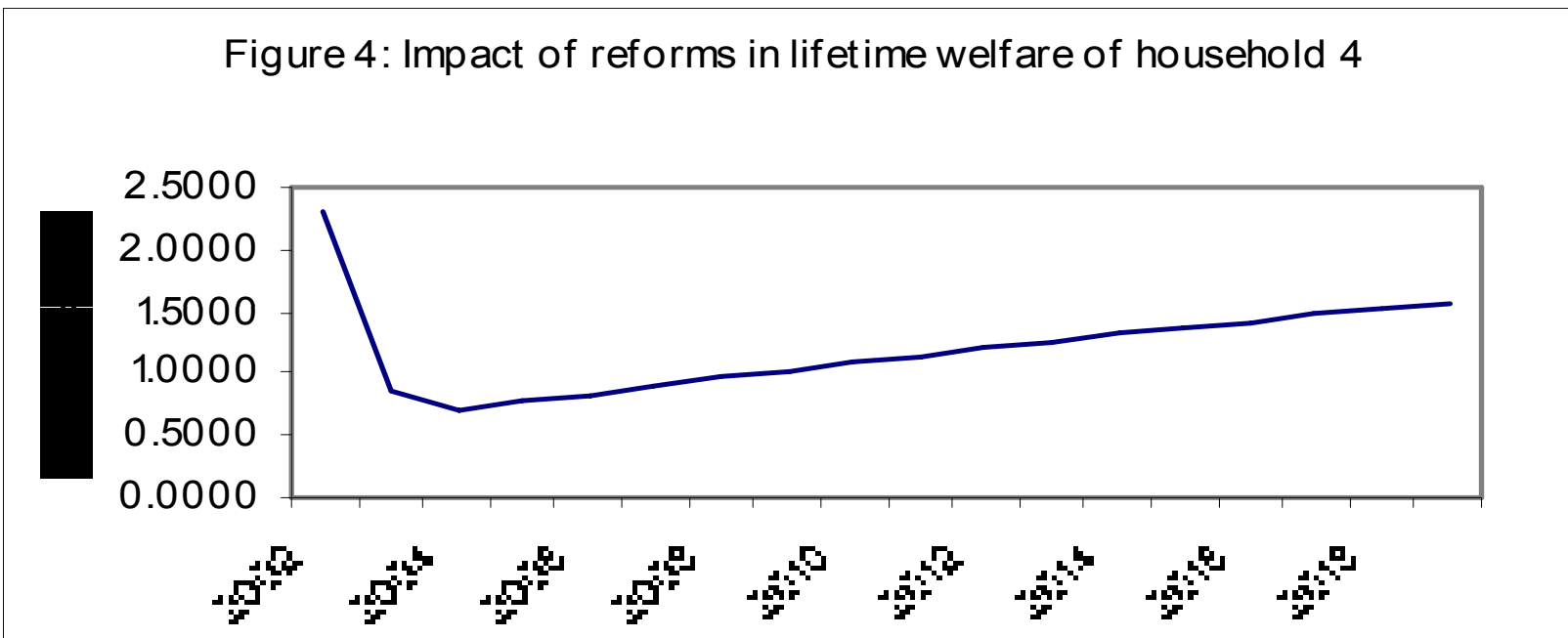
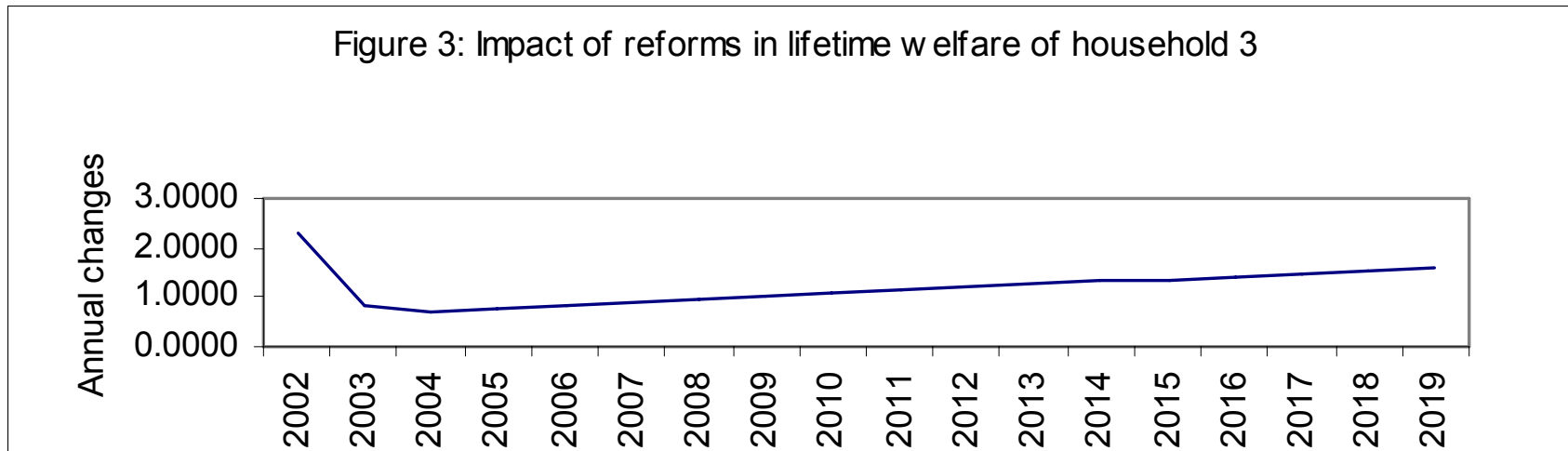
Labour Supply of household h



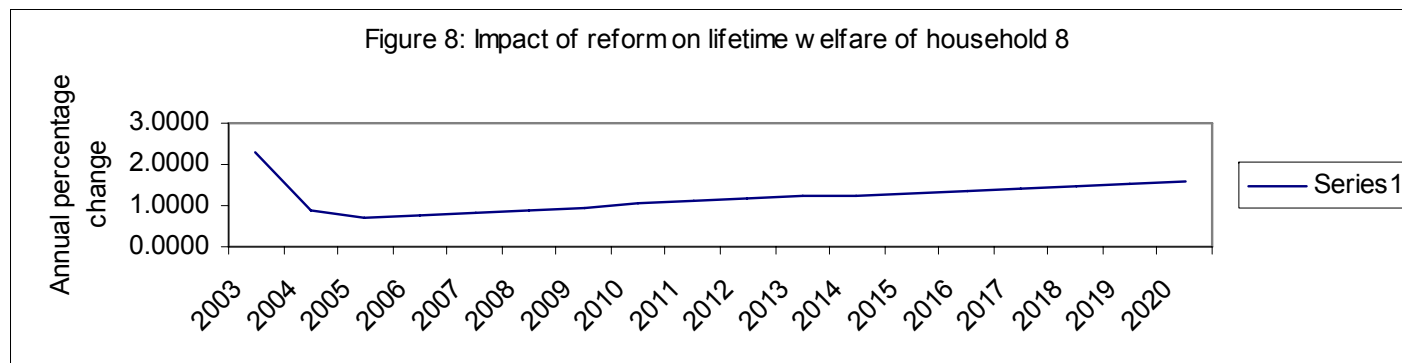
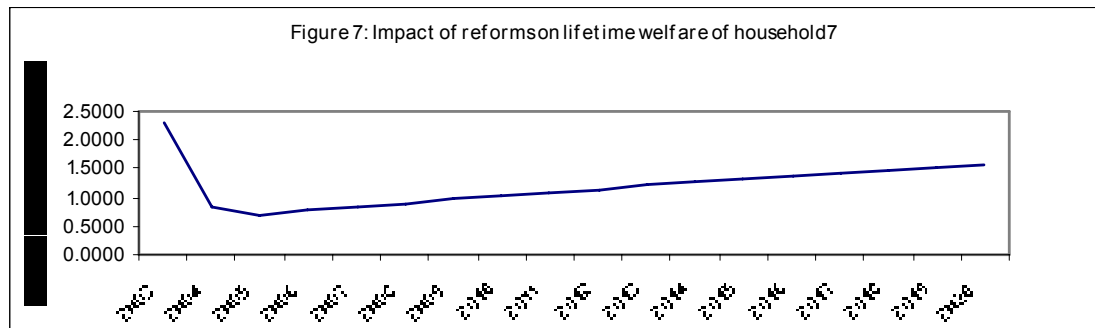
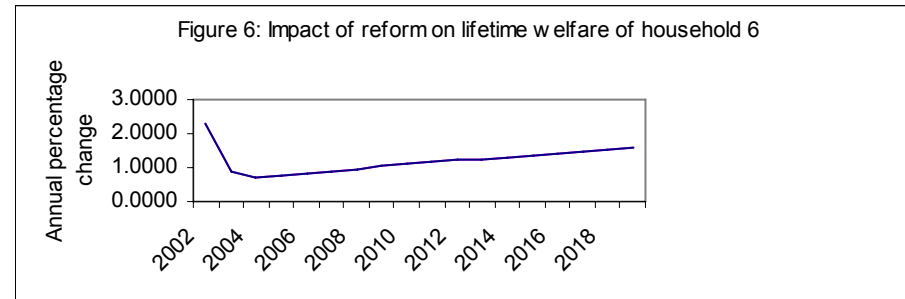
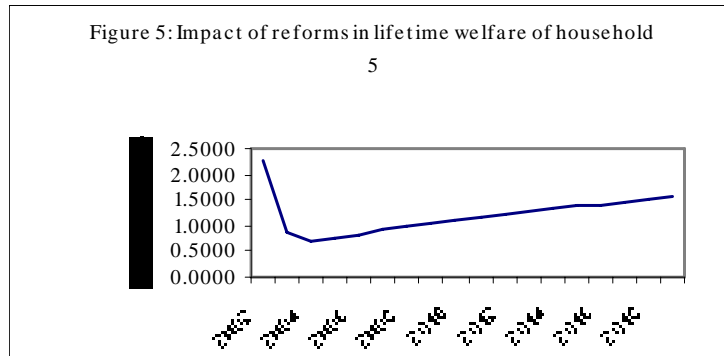
# Results of General Equilibrium Model for Redistribution and Growth for the Nepalese Economy -1



# Results of General Equilibrium Model for Redistribution and Growth for the Nepalese Economy -2



# Results of General Equilibrium Model for Redistribution and Growth for the Nepalese Economy -3



## Estimated Model Equations

$$\begin{aligned} \text{REXP} &= + 0.5132 \cdot \text{RM3} - 7.506\text{e-}009 \cdot \text{lending rate} + 4.942\text{e-}007 \cdot \text{Exrate} \\ (\text{SE}) & \quad (0.0273) \quad (4.25\text{e-}010) \quad (2.06\text{e-}009) \\ & + 6.266\text{e-}009 \cdot \text{PopGrth} + 6.988\text{e+}007 \\ & \quad (8.25\text{e-}011) \quad (3.64\text{e-}011) \end{aligned}$$

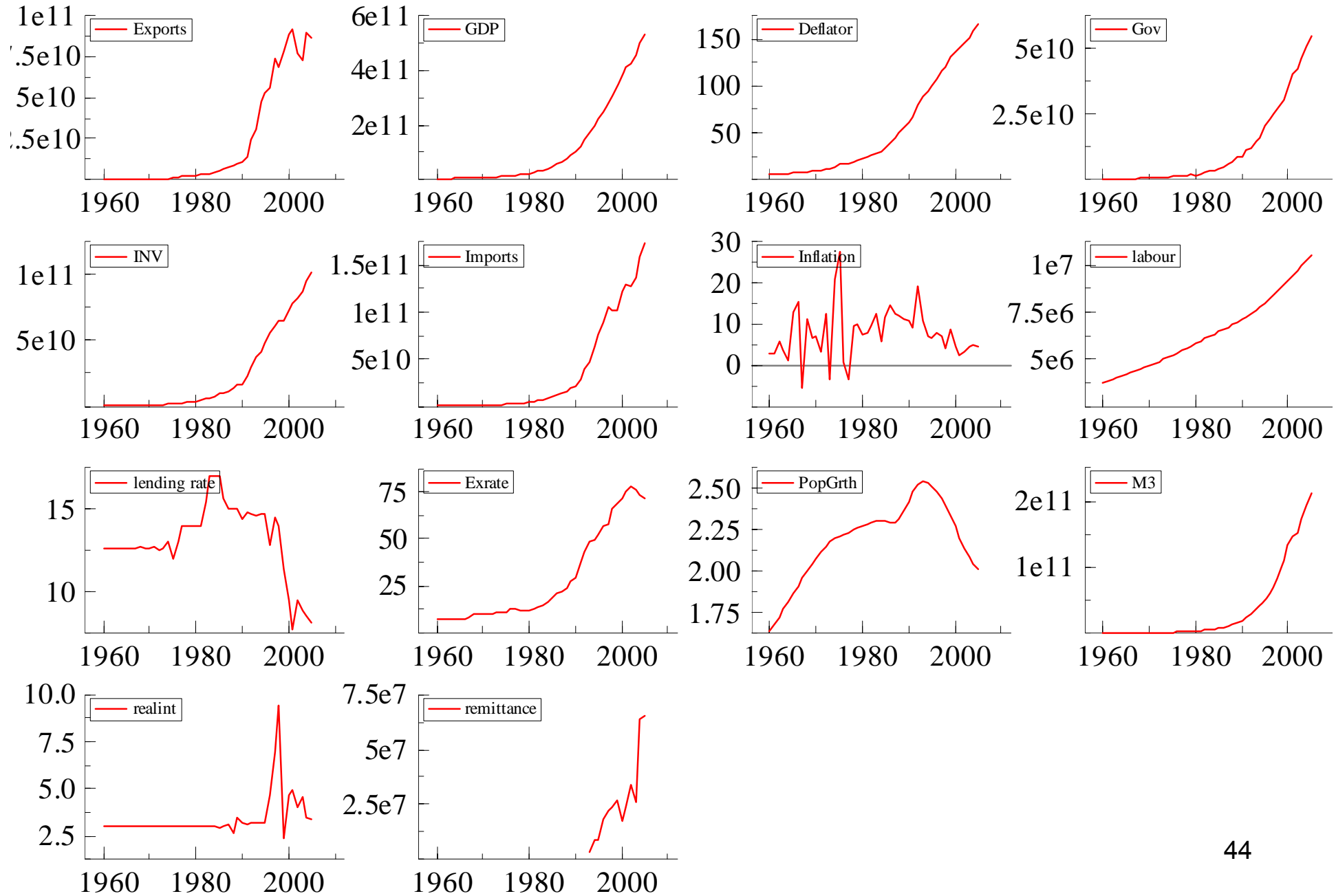
$$\begin{aligned} \text{RGDP} &= + 2.052 \cdot \text{RM3} + 2.636\text{e-}008 \cdot \text{lending rate} + 2.75\text{e-}007 \cdot \text{Exrate} \\ (\text{SE}) & \quad (0.0488) \quad (7.6\text{e-}010) \quad (3.68\text{e-}009) \\ & + 2.403\text{e-}008 \cdot \text{PopGrth} + 8.736\text{e+}008 \\ & \quad (1.48\text{e-}010) \quad (6.51\text{e-}011) \end{aligned}$$

$$\begin{aligned} \text{RGOV} &= + 0.2184 \cdot \text{RM3} + 3.434\text{e-}007 \cdot \text{lending rate} - 7.509\text{e-}007 \cdot \text{Exrate} \\ (\text{SE}) & \quad (0.00454) \quad (7.07\text{e-}011) \quad (3.42\text{e-}010) \\ & - 2.215\text{e-}008 \cdot \text{PopGrth} + 6.476\text{e+}007 \\ & \quad (1.37\text{e-}011) \quad (6.06\text{e-}012) \end{aligned}$$

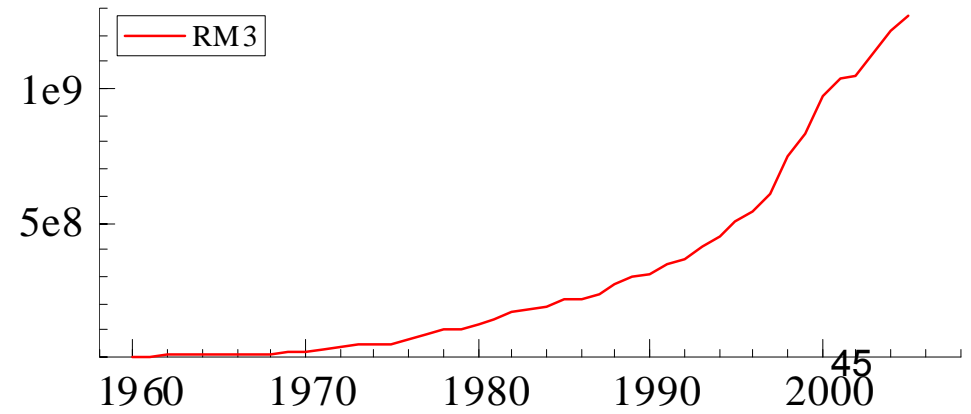
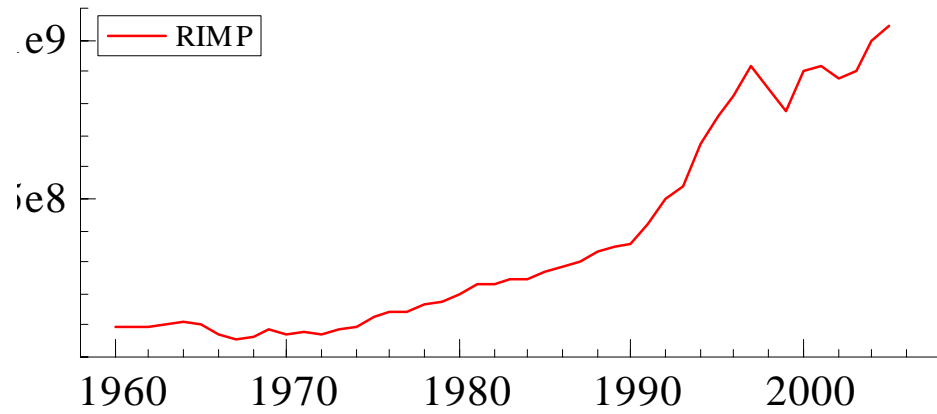
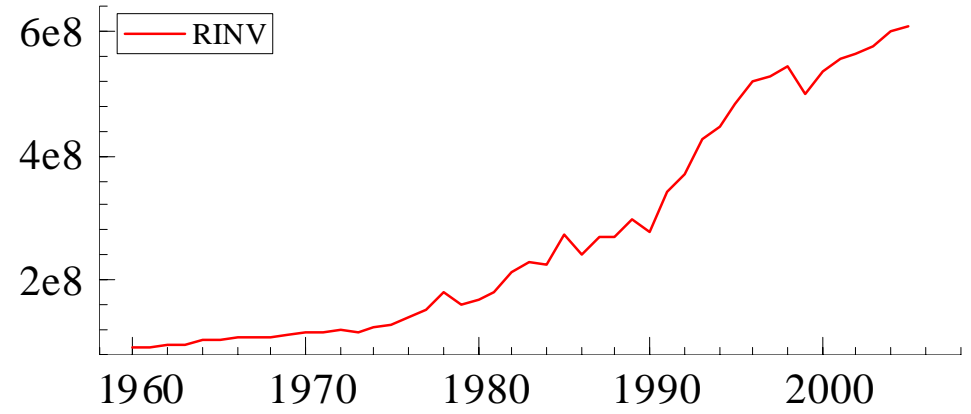
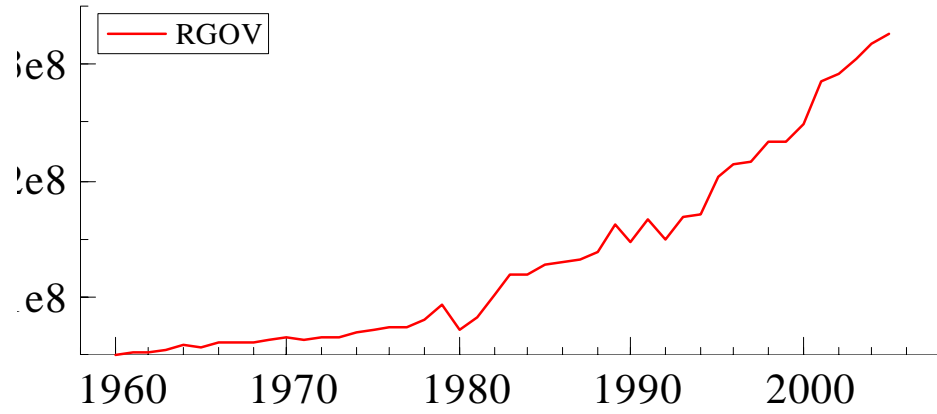
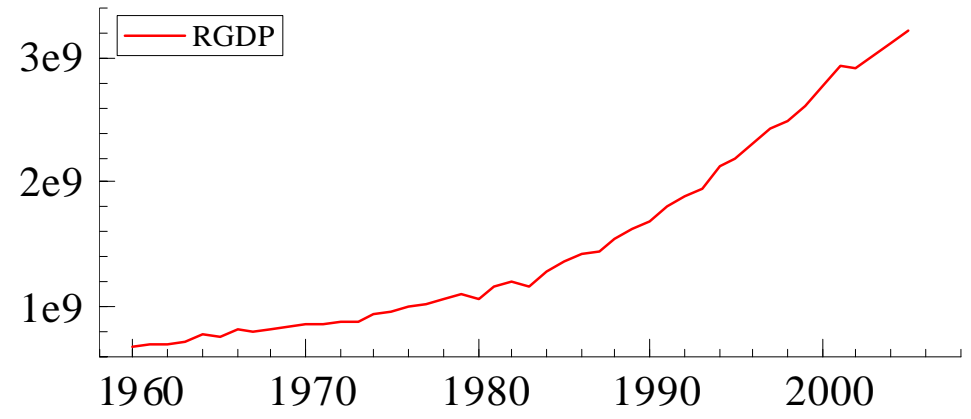
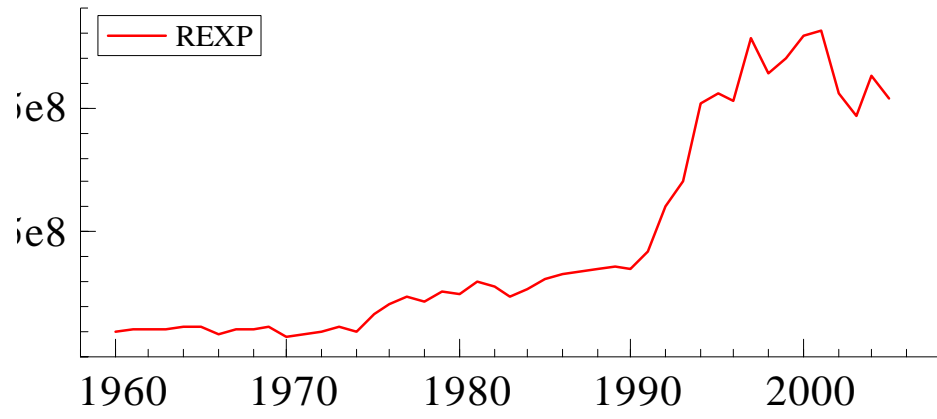
$$\begin{aligned} \text{RINV} &= + 0.4502 \cdot \text{RM3} + 3.931\text{e-}007 \cdot \text{lending rate} + 6.156\text{e-}007 \cdot \text{Exrate} \\ (\text{SE}) & \quad (0.0175) \quad (2.73\text{e-}010) \quad (1.32\text{e-}009) \\ & + 2.089\text{e-}008 \cdot \text{PopGrth} + 1.321\text{e+}008 \\ & \quad (5.3\text{e-}011) \quad (2.34\text{e-}011) \end{aligned}$$

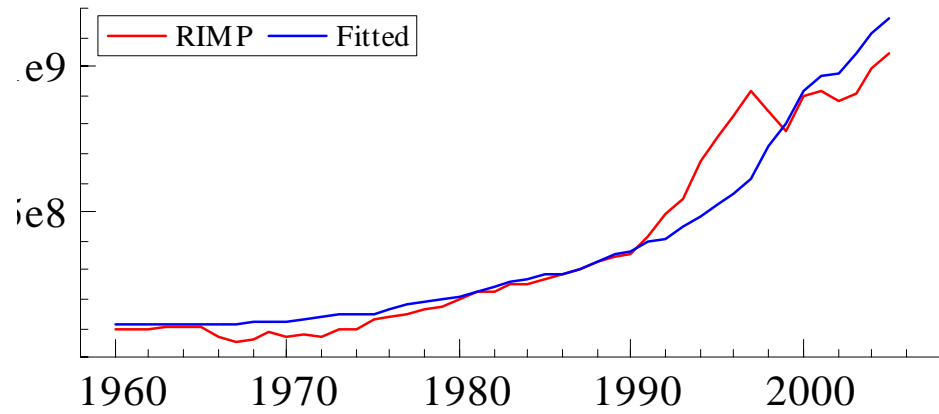
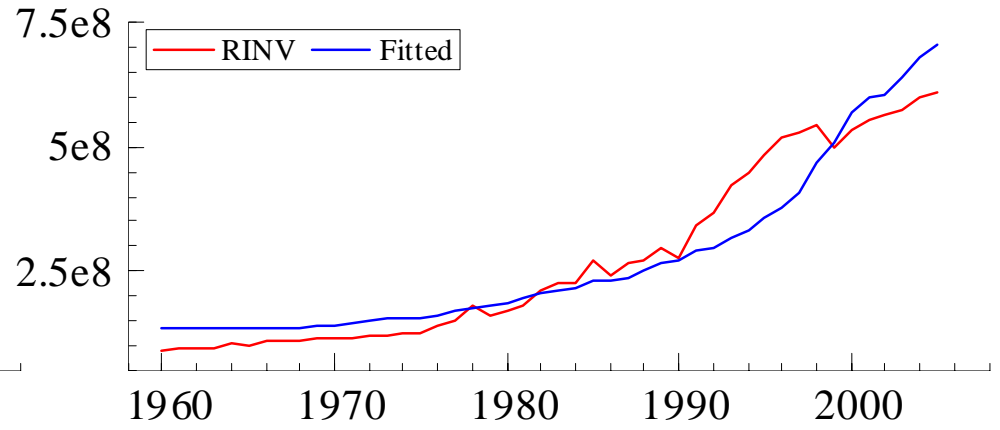
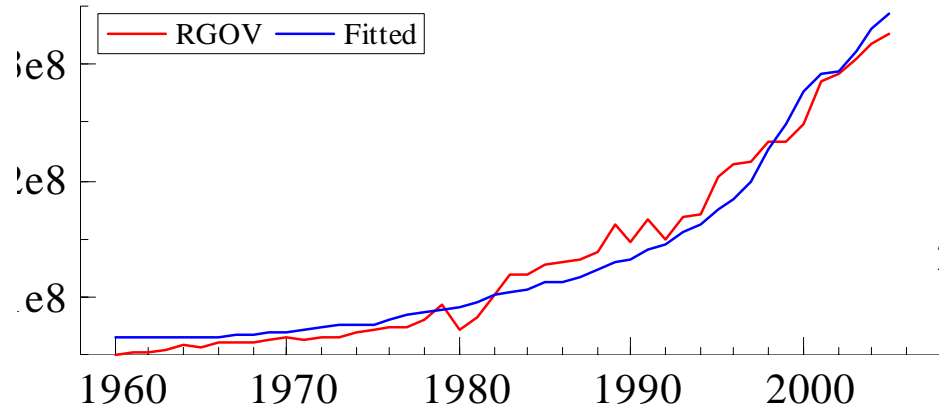
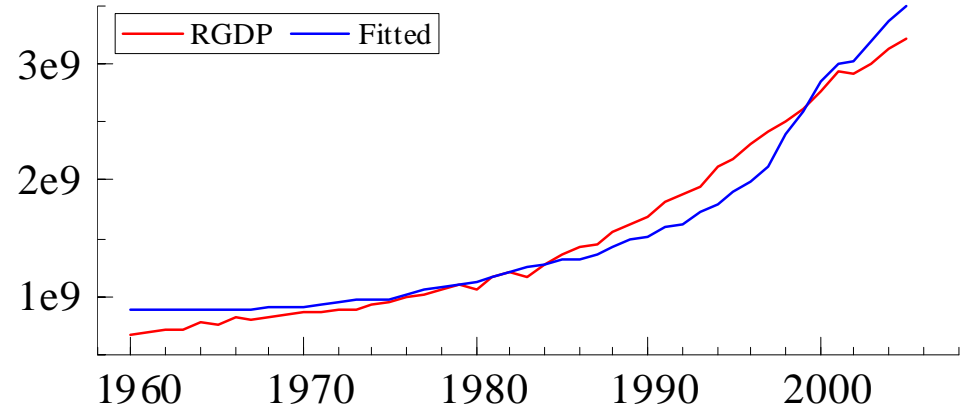
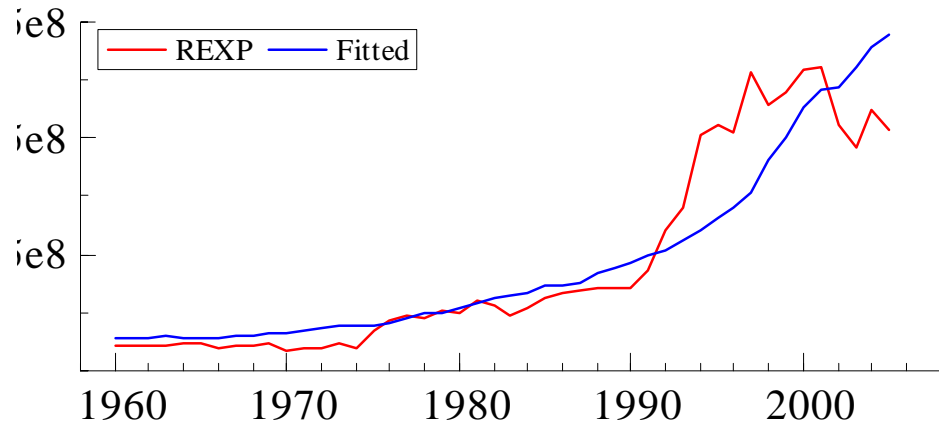
$$\begin{aligned} \text{RIMP} &= + 0.8318 \cdot \text{RM3} - 7.534\text{e-}008 \cdot \text{lending rate} - 1.918\text{e-}007 \cdot \text{Exrate} \\ (\text{SE}) & \quad (0.029) \quad (4.51\text{e-}010) \quad (2.18\text{e-}009) \\ & - 1.639\text{e-}008 \cdot \text{PopGrth} + 1.066\text{e+}008 \\ & \quad (8.77\text{e-}011) \quad (3.87\text{e-}011) \end{aligned}$$

# Nominal Magnitudes

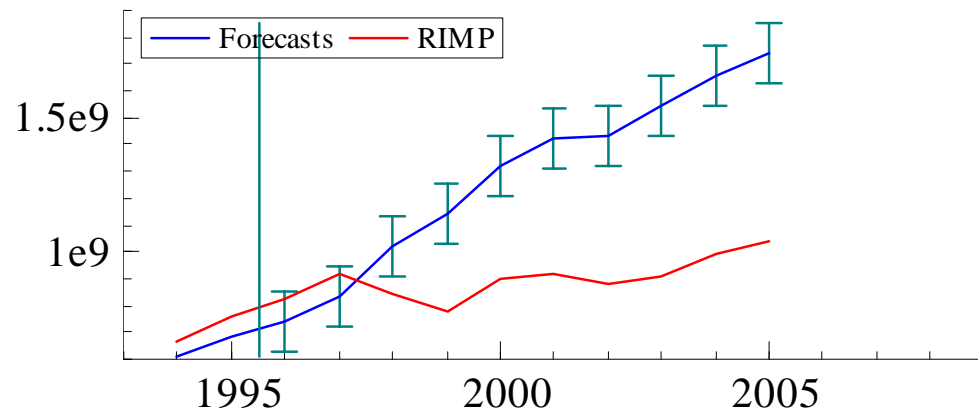
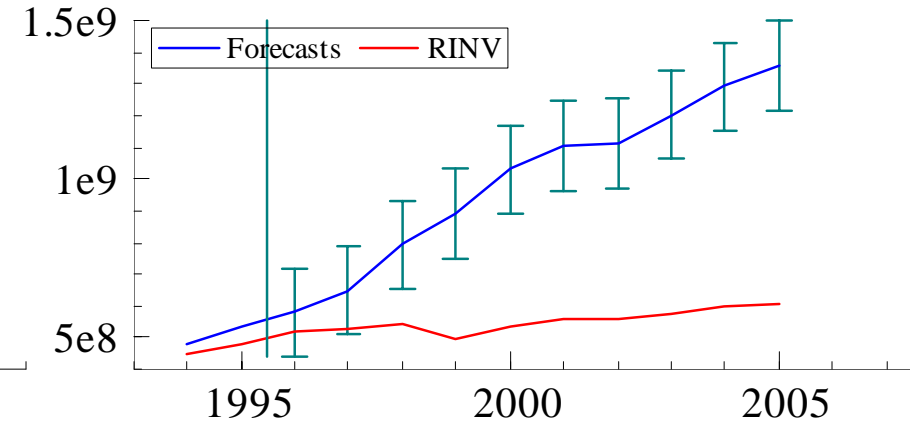
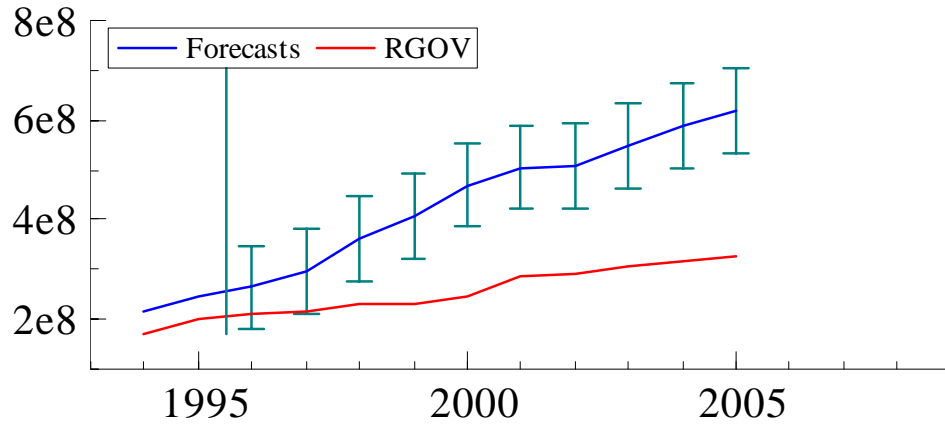
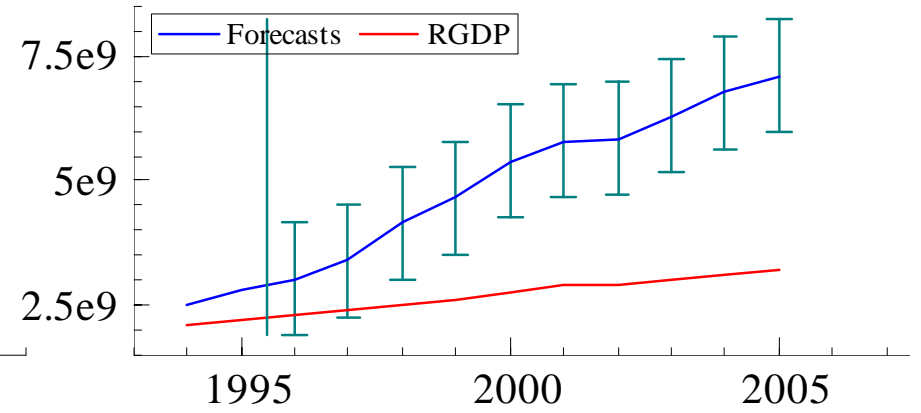
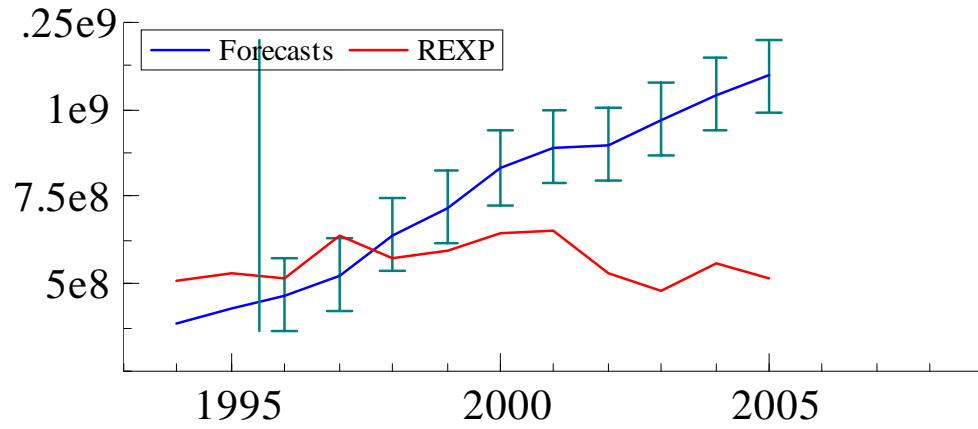


# Deflated Real Macro Variables





# How Accurate Are Forecasts?



## Conclusion

- Constituent Assembly 2008: a big democratic achievement and result of cooperation among major political players.
- Conflict continues due to myopic vision and narrow party- interests. Democracy is very fragile.
- Constitution will not come without cooperation of three four major parties (CPN(M), NC, CPN(UML), TMLP).
- Economic growth and alleviation of poverty should be top priority.
- No party is in pivotal position.
- Game theory, macro models and dynamic general equilibrium models can be applied to analyse problems and to find short and long run solutions.

## Dynamic Objective Function of Players

$$V = \int_{t=0}^{t=\infty} v(i) e^{-rt} dt$$

### Literature

Nash (1951), Shapley (1953), Debreu and Scarf (1963), Scarf (1967)  
Shapley and Shubik (1969), McKinnon (1973), Shaw (1973)  
Fama (1980), Stiglitz and Weiss (1981), Townsend (1983),  
Shoven and Whalley (1984), Boyd and Prescott (1986)  
Scarf and Shoven (1986), Epstein and Zin (1989), Greenwood and Boyan (1990)  
Roubini and Sala-i-Martin (1992); Mercenier and Srinivasan ed. (1994)  
Ginsburgh and Keyzer (1997), Levine (1997), Raghuram and Zingales (1998)  
Rutherford (1998), Hansen, Sargent and Tallarini (1999)  
Chari, Kehoe and McGrattan (2000),  
Arestis., Demtriades and Luintel (2001)  
Bhattarai K (2008)

# Vast literature in macroeconomic modelling

- Keynes (1936), Hicks (1937), Samuelson (1939),
- Phillips (1958), Friedman (1968), Phelps (1968), Tobin (1969),
- Sargent and Wallace (1975), Lucas (1976), Fisher (1977), Kydland and Prescott (1977), Wallis (1980), King and Plosser (1984) Mankiw (1989), Prescott (1986), Taylor (1987)
- Blanchard and Kiyotaki (1987), Manning (1995), Rankin (1992)
- Barro and Gordon (1983), Sargent (1986) Goodhart (1989), Nickell (1990), Mankiw and Romer (1993), Lockwood Miller and Zhang (1998)
- Wallis (1989), MPC (1999), Pagan and Wickens (1989), Hendry (1995), Holly Weale (2000)
- Taylor (1993), Sargent and Ljungqvists (2000), Minford and Peel (2002), Blake and Weal (2003), Garratt, Lee, Pesaran and Shin (2003)
- Solow (1956), Lucas (1988), Romer (1990), Mankiw, Romer and Weil (1992),
- Harrod (1939), Domar (1947) and Solow (1956), Parente and Prescott (1993)
- Fullerton, Shoven and Whalley (1983), Auerbach and Kotlikoff (1987), Perroni (1995), Rutherford (1995), Bank of England, NIESR) Kehoe, Srinivasan and Whalley (2005), Bhattarai (1997, 1999)