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Macro crises, Expectations and Coordination Failures

Daniel Heymann and Gustavo Montero

This is not a paper…

Draft, October 4, 2019
Preliminary and Incomplete

Notes on Expectations, Coordination Failures and Macro Crises

Daniel Heymann and Gustavo Montero

1. Introduction: analyzing large-scale

More than half a century ago, Hicks
belongs to monetary history...Monetar
The literature on economic crises was a
it has grown considerably since then. Bu

These notes are motivated by the sea
malfunctions (like the recurrent cris
occurring as the present meeting proc
follows is preliminary in nature: it belo
one tries to explore the field of interes
anticipation that they may subsequent
we focus on certain aspects of crises,
expectations formation in the buildup
elements such as the mechanisms tha
potential buffers to limit the effects of

We concentrate on a particular set of
and disruptions in asset markets, inv

Big Recessions

Big recessions

- Not uncommon in recent history.
- Majority of economies showed declines in GDP over 4% since 1970.
- A substantial number of countries had two or more episodes.

Big recessions

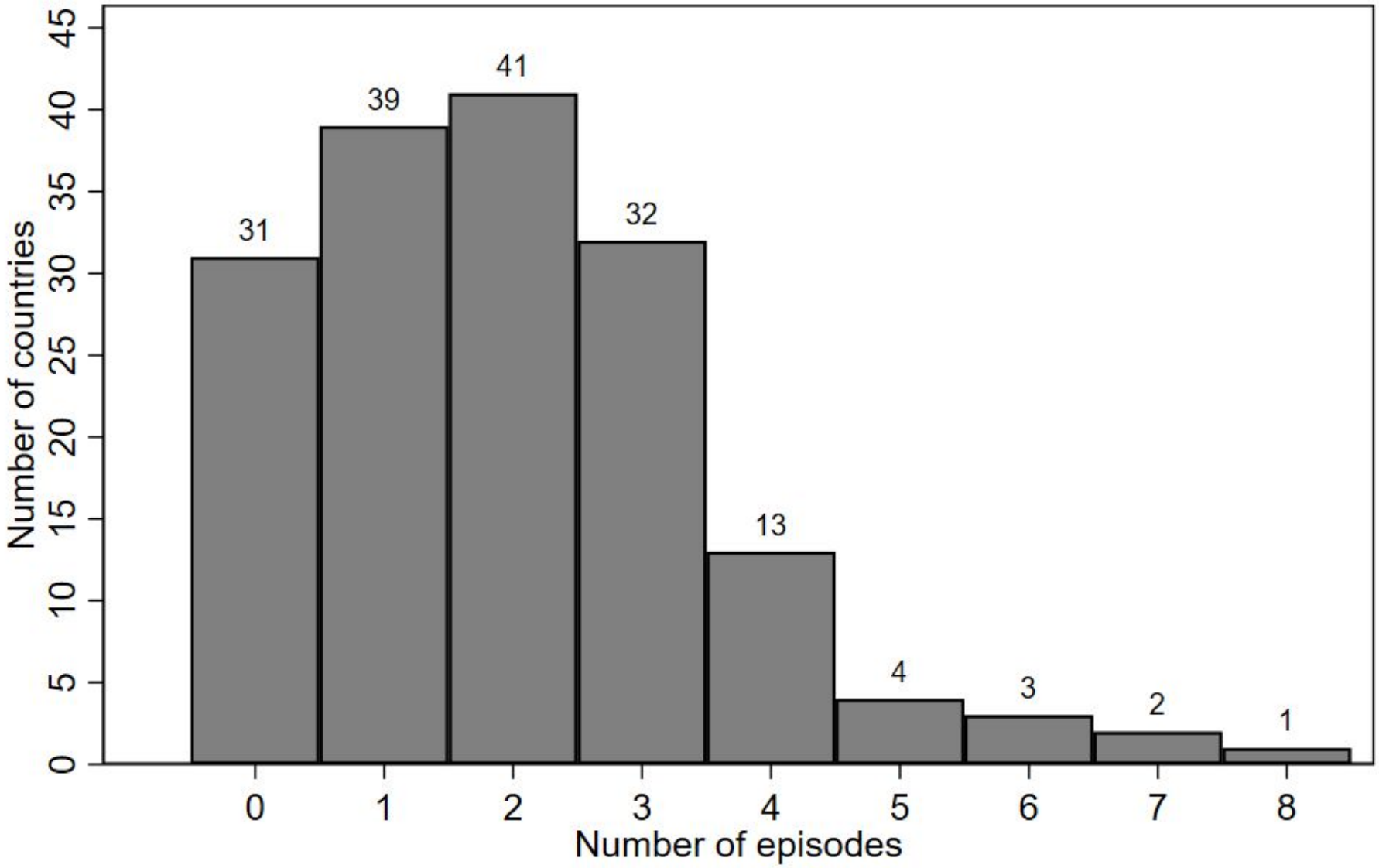
- 329 cases of recessions with accumulated drops in GDP exceeding 4%.
- Of the 166 countries surveyed, 135 (more than 80%) experienced at least one episode.
- For some economies, big contractions were a repeated event, up to a maximum of eight in less than 50 years.
- Almost 20 economies spent ten or more years in such recessions.

Big recessions

- We concentrate on a particular set of economic events, marked by:
  - Large falls in real output
  - Disruptions in asset markets, involving private debts, government liabilities, debts or both.

- First, we examine some observable features of events and the economies concerned, trying to discriminate between:
  - Special characteristics of time and space *("no two episodes alike").*
  - Common elements.

Distribution of Events by Country



Big recessions, SLIT and NSLIT countries

Discernible subsets: two large groups

- **SLIT Economies:**
  - Small size and/or low- income countries; transitions away from planned systems.

- **NSLIT Economies**

Big recessions, SLIT and NSLIT countries

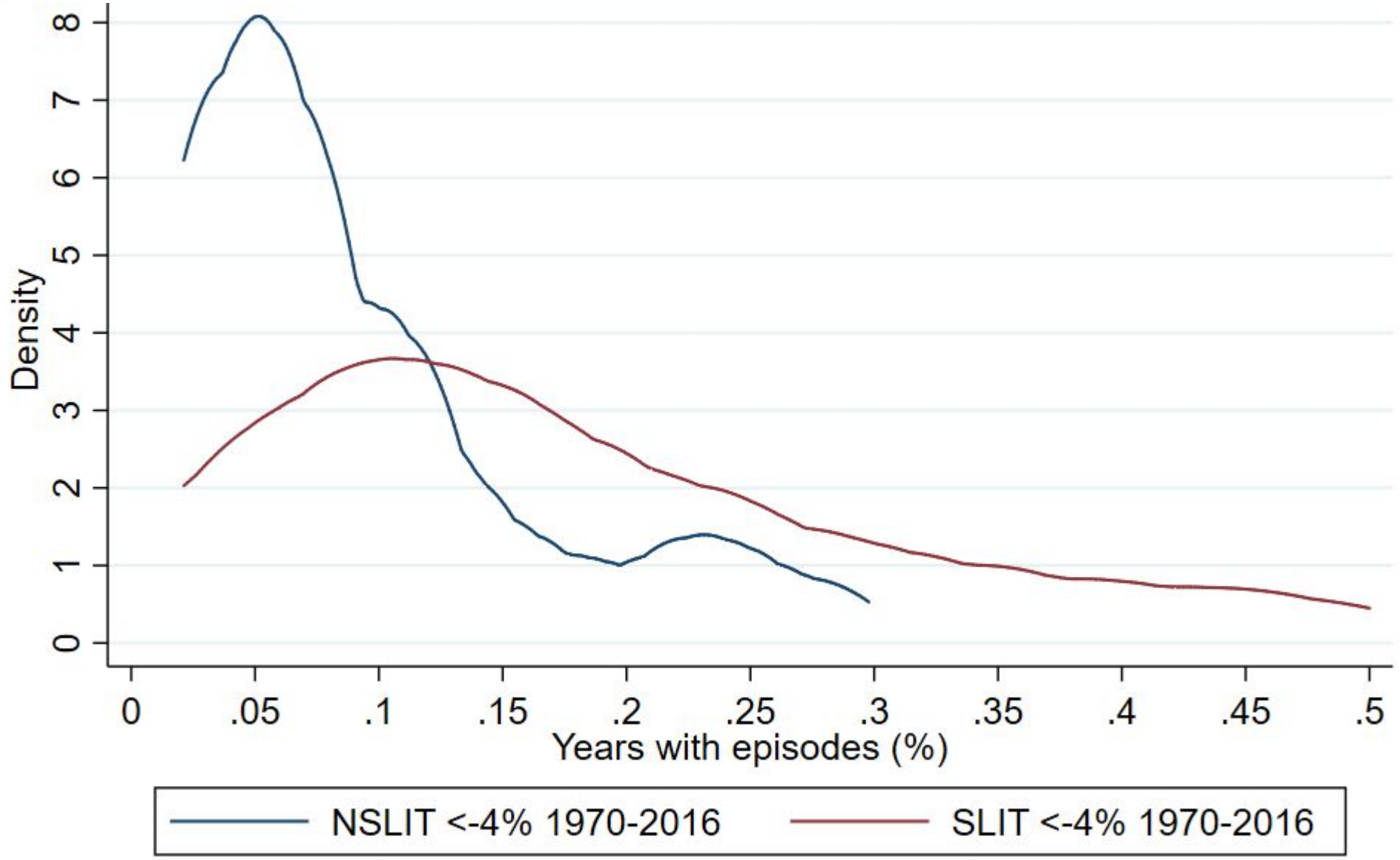
- SLIT countries are **more prone** to experience big recessions , and typically have **spent more time** in those conditions than NSLIT economies.

- The difference between the two groups of countries is **more pronounced** if the comparison is made over more **extreme recessions**.

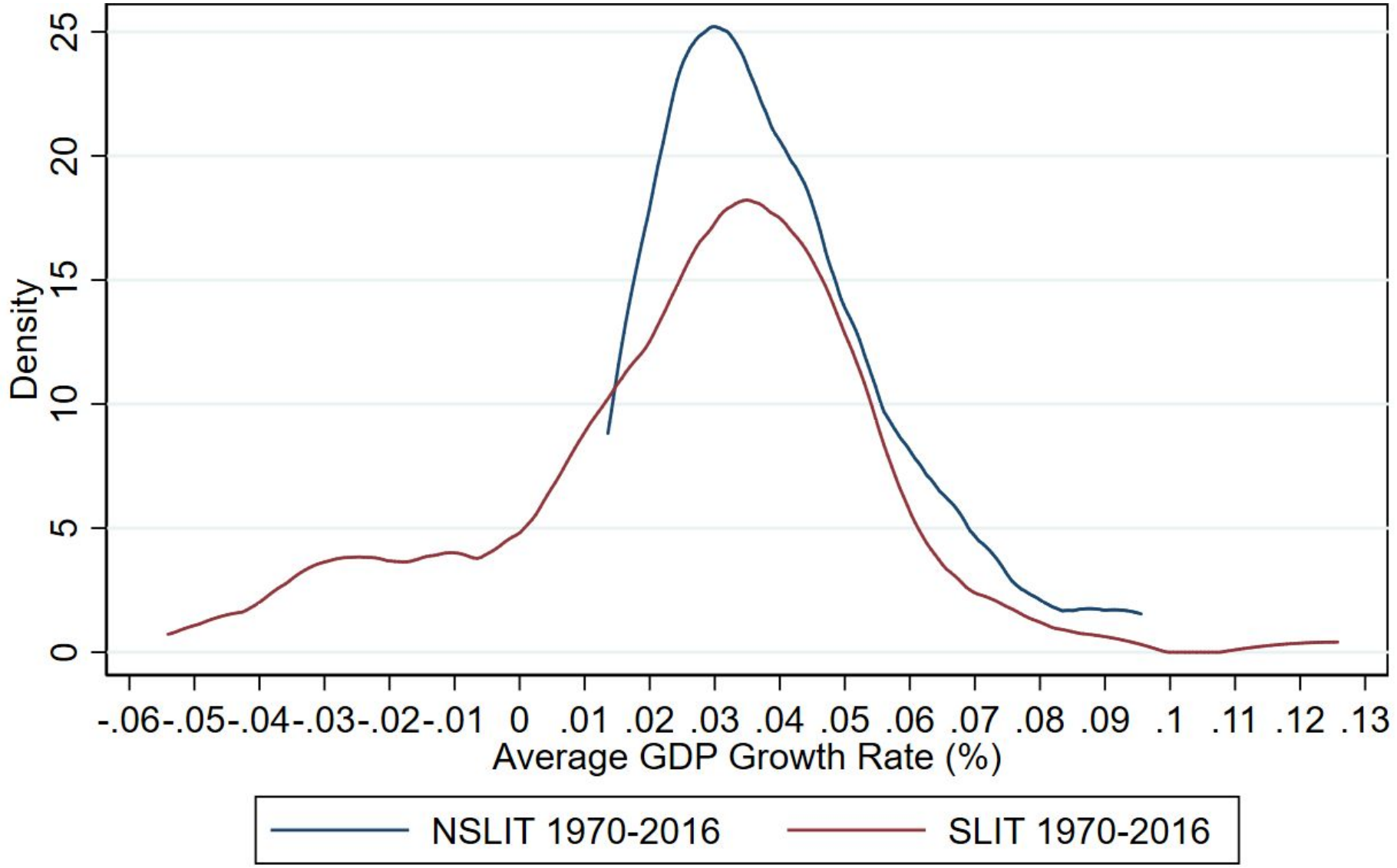
Big recessions, SLIT

- Small or low-income economies, on the whole, specificities due to **sensitivity to outside shocks**.
- Transitions also particular cases, even if crises present.
- **More than half** of big recessions in SLIT **economies do not appear to be related with crises as here defined**.
- Strong association of events small- low in those episodes with international recessions and events like armed conflicts and natural disasters.

Density Functions, Distribution of Years in Big Recessions
SLIT and NSLIT Economies



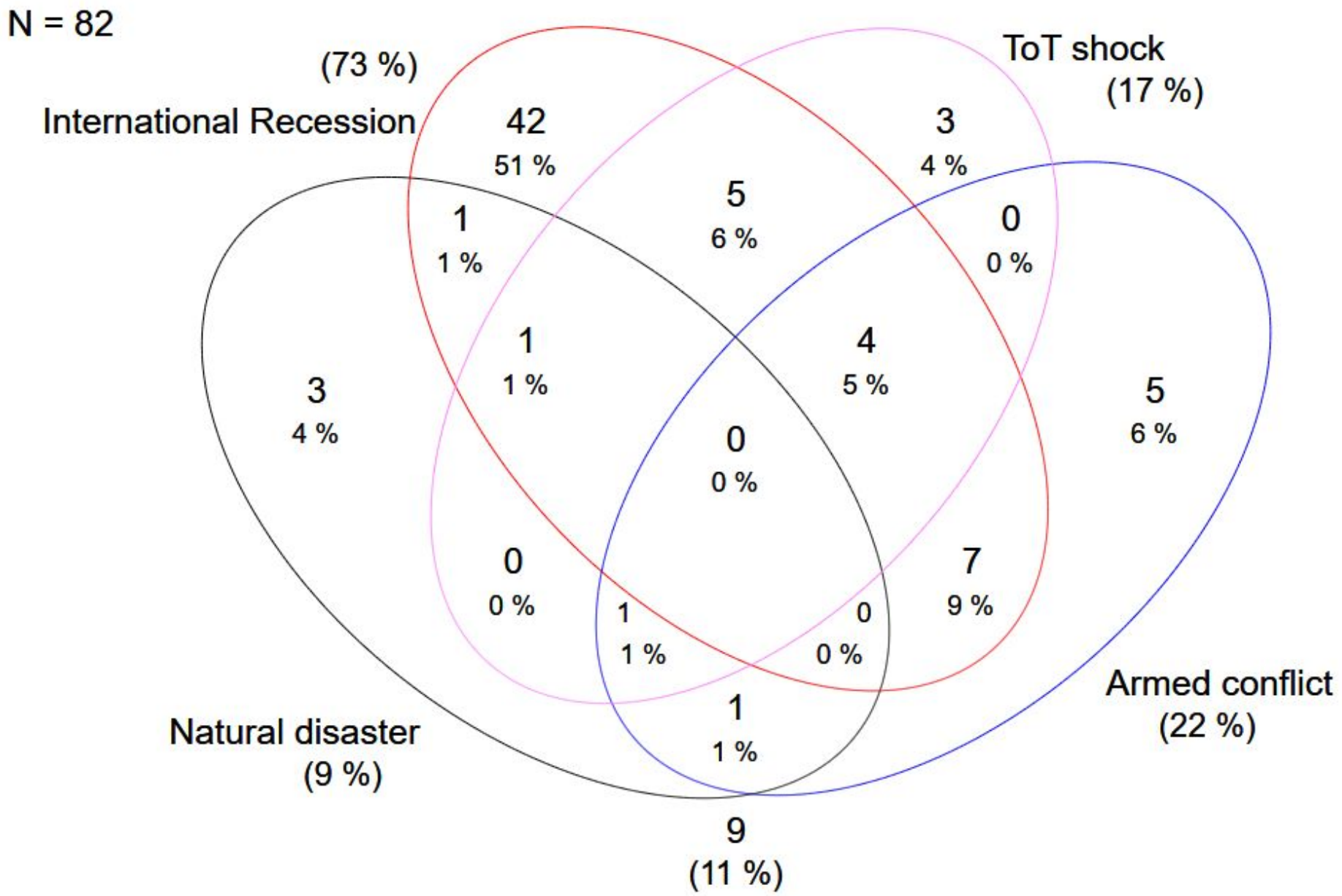
Density Function, Average Growth Rate by Country
SLIT and NSLIT Economies



Big recessions, NSLIT

- Instances where recession not associated with crisis conventionally defined: substantial number of cases in the Middle East, with a high incidence of armed conflicts.
- Leaving aside those instances, group of episodes where financial/debt disruptions seem central components of output contractions.
- (But note: banking crises not necessarily associated with big recessions: 30% exceptions in NSLIT economies).

Big Recessions & Crisis, NSLIT Countries
Numbers and Percentages of Episodes



Big recessions, NSLIT crisis

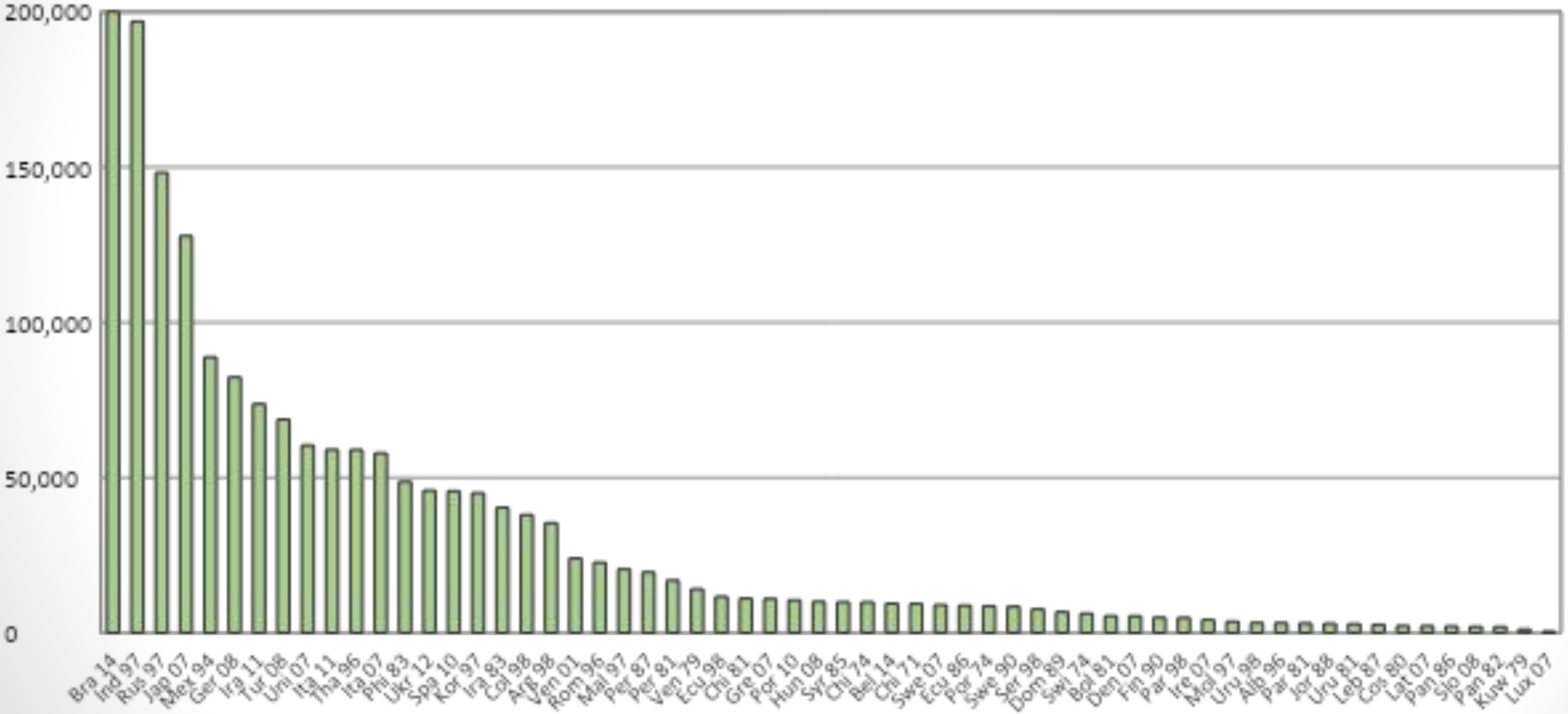
- The set includes historically salient events such as:
  - LATAM in the 1980s (with the particularity of featuring high inflations in most cases).
  - Sweden/ Finland in early 1990s.
  - “Emerging economies” in late 1990s, early 2000´s, among them Asian crises.
  - Global crises in late 2000´s: majority of big recessions in wealthier countries.
  - “Off sample”, large- scale episodes, like Great Depression or Japanese “balance sheet recession” (although characterized more by length than depth of contraction).

Big recessions, NSLIT crisis

- Heterogeneites in several dimensions:
  - Economies large and small, central and peripheral, rich and less rich.
  - Financial systems with different sizes, configurations, sophistication of assets; debt denomination.
  - Varieties of monetary, exchange regimes and policies. Monetary policy potentially among main actors in generation of crises. But crashes in economies without (or with very limited) independent monetary policies.
  - Capital inflows pre- crisis, not always.
  - Government or twin deficits, sometimes

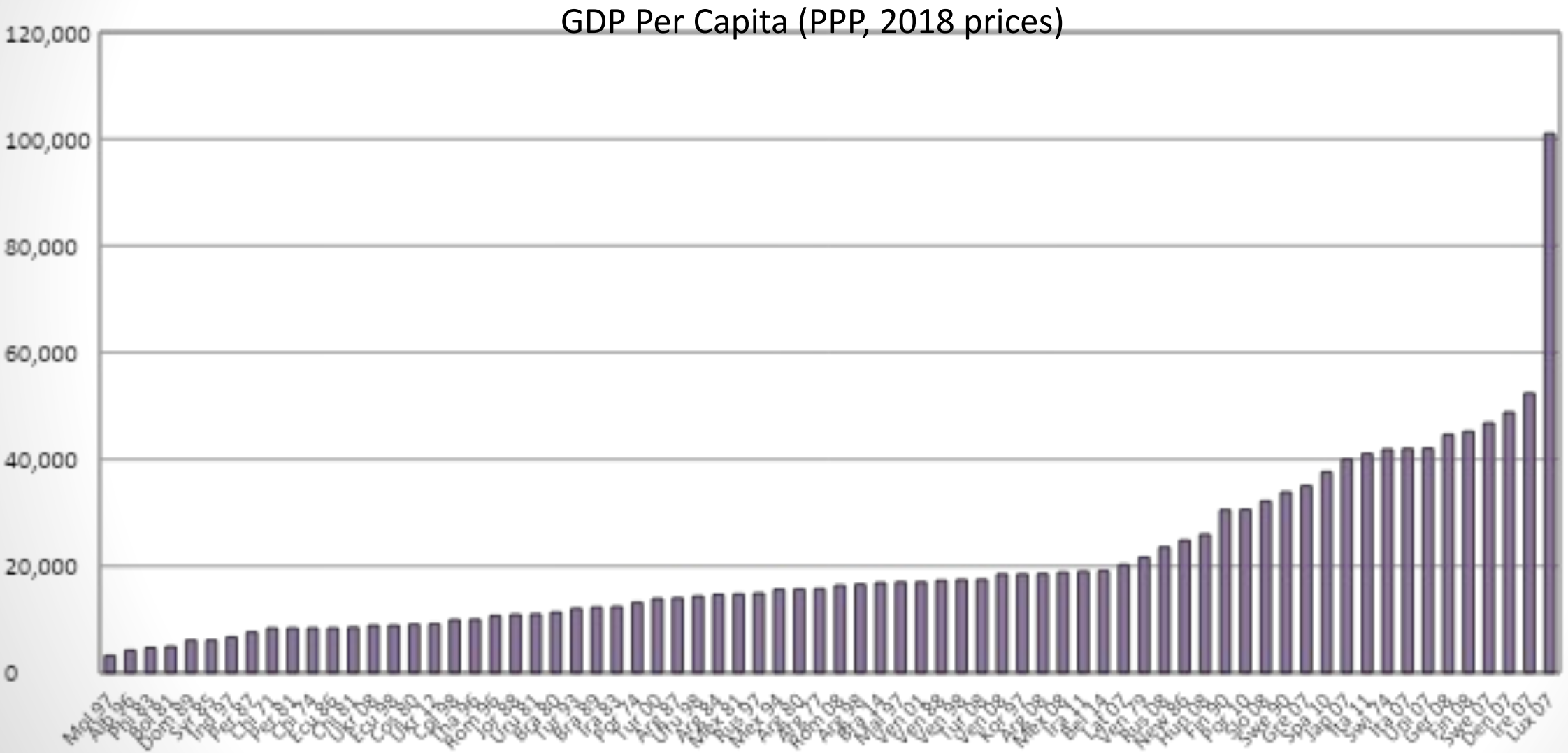
Crises and Big Recessions: heterogeneities

Population



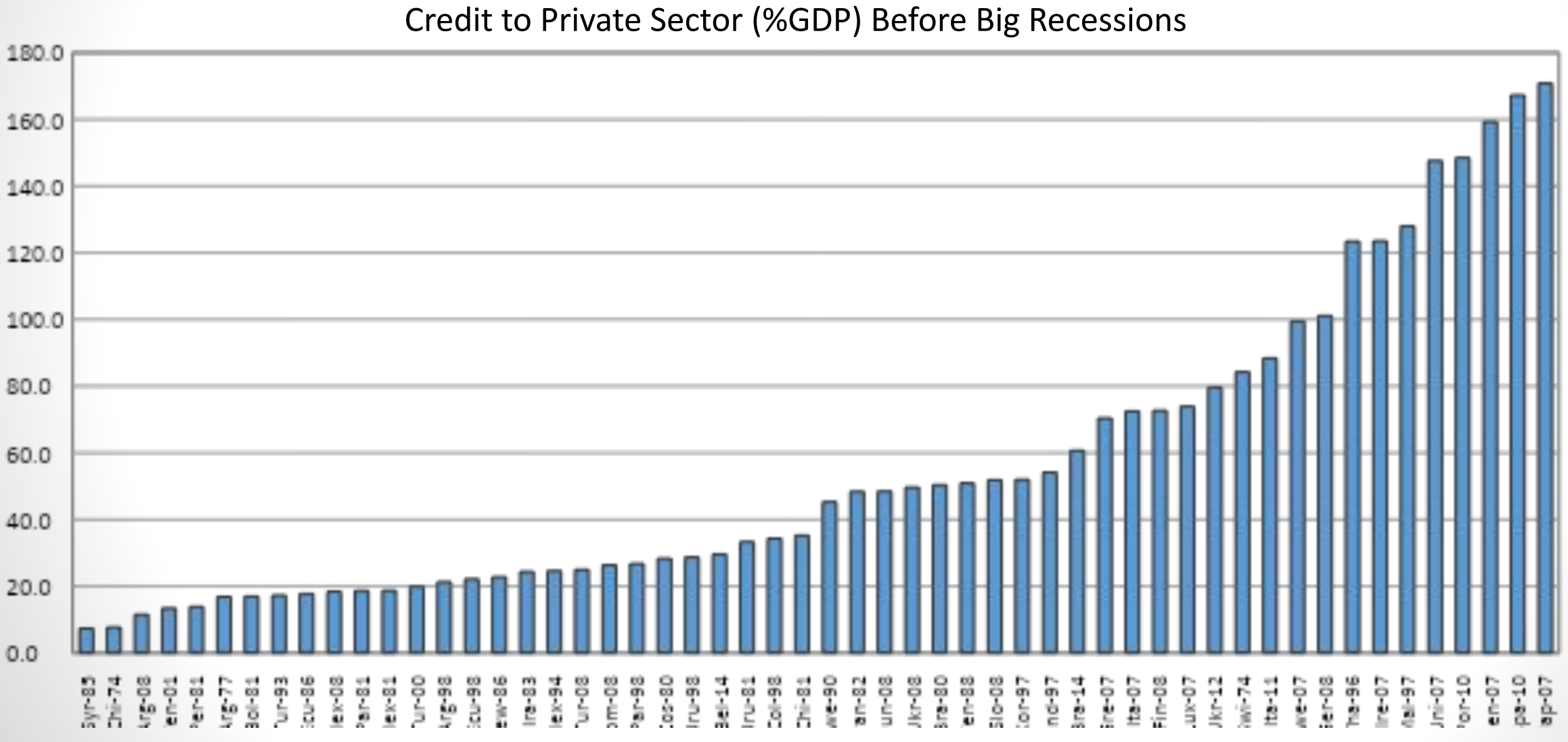
Crises and Big Recessions: heterogeneities

Per capita income



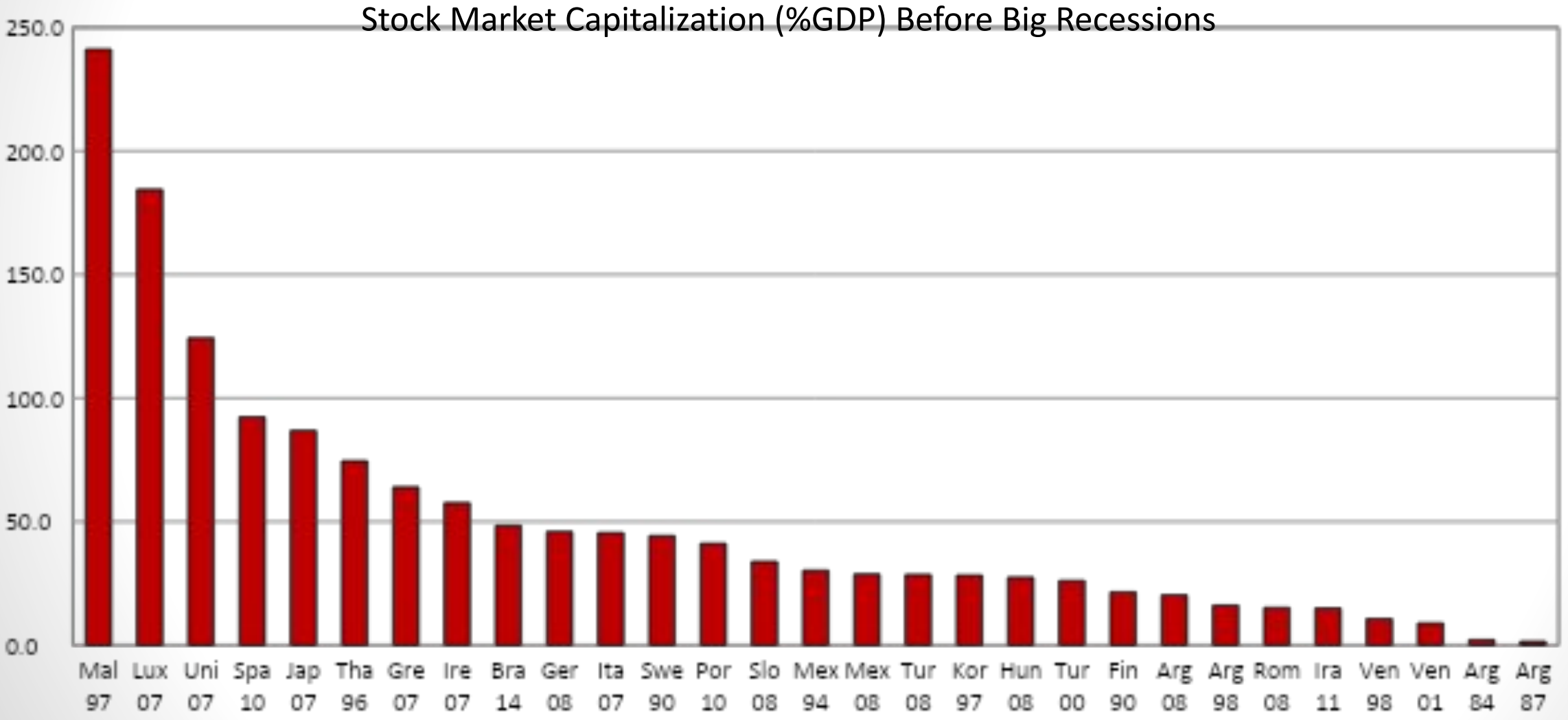
Crises and Big Recessions: heterogeneities

Monetary and Financial variables



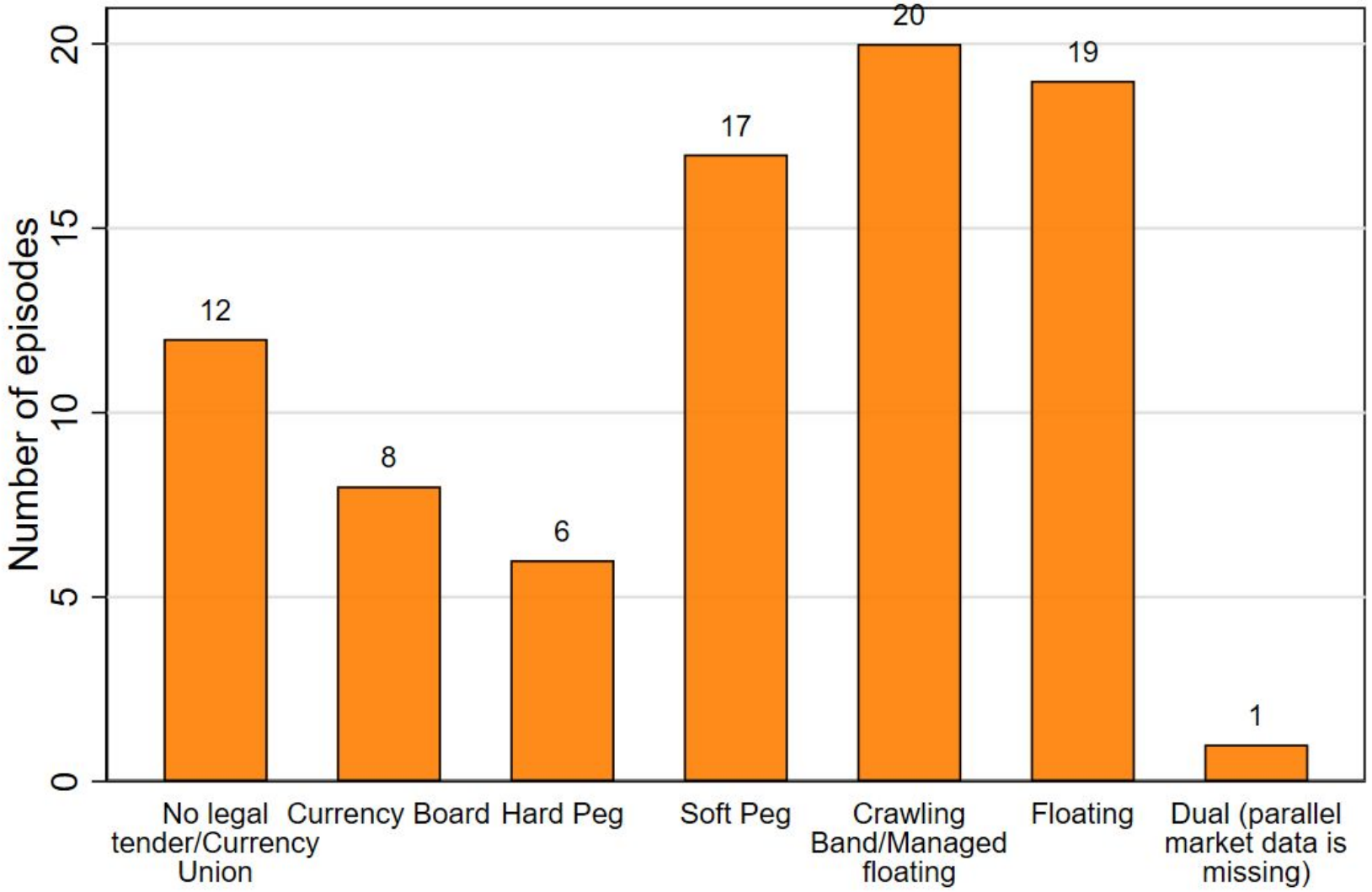
Crises and Big Recessions: heterogeneities

Monetary and Financial variables



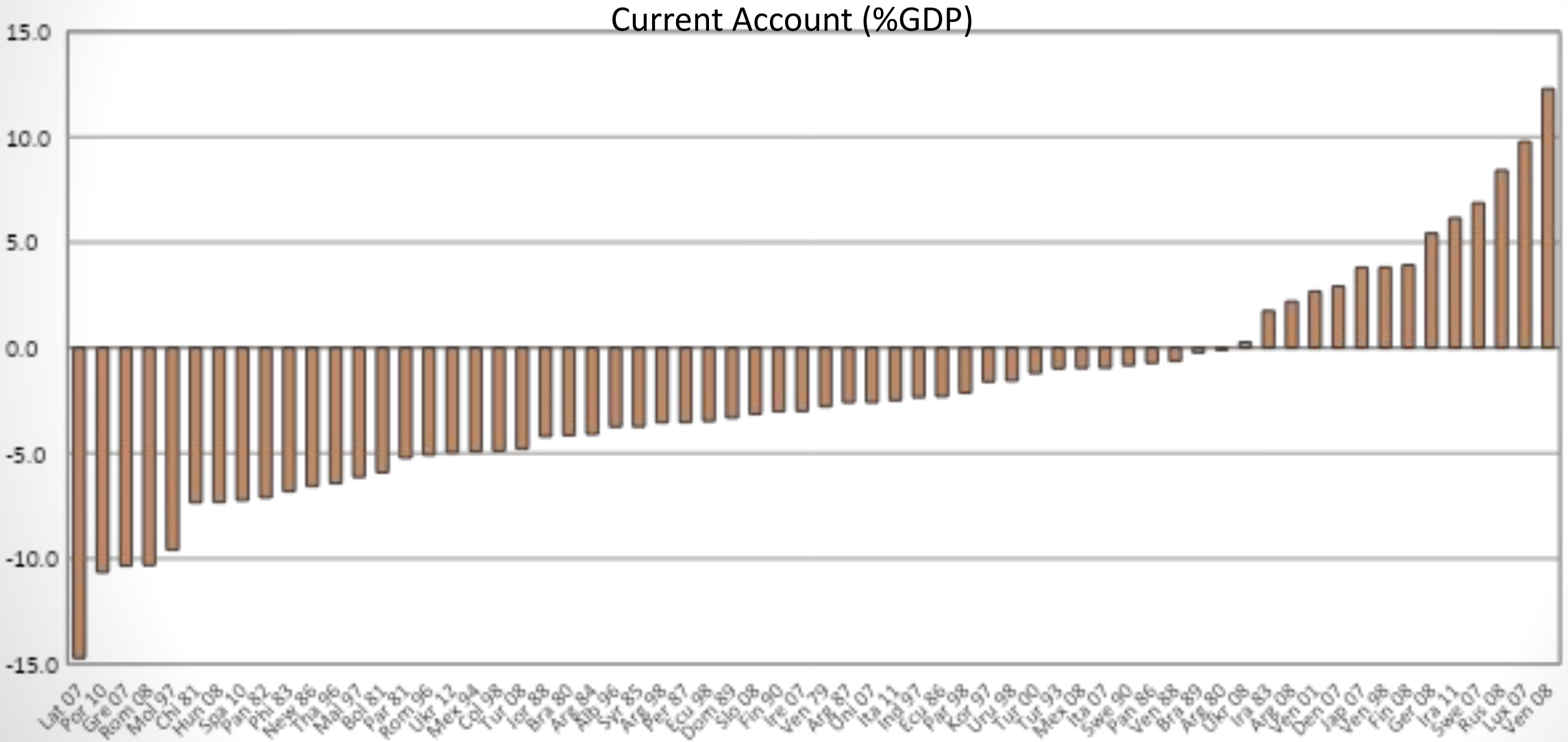
Crises and Big Recessions: heterogeneities

Currency Regimes



Crises and Big Recessions: heterogeneities

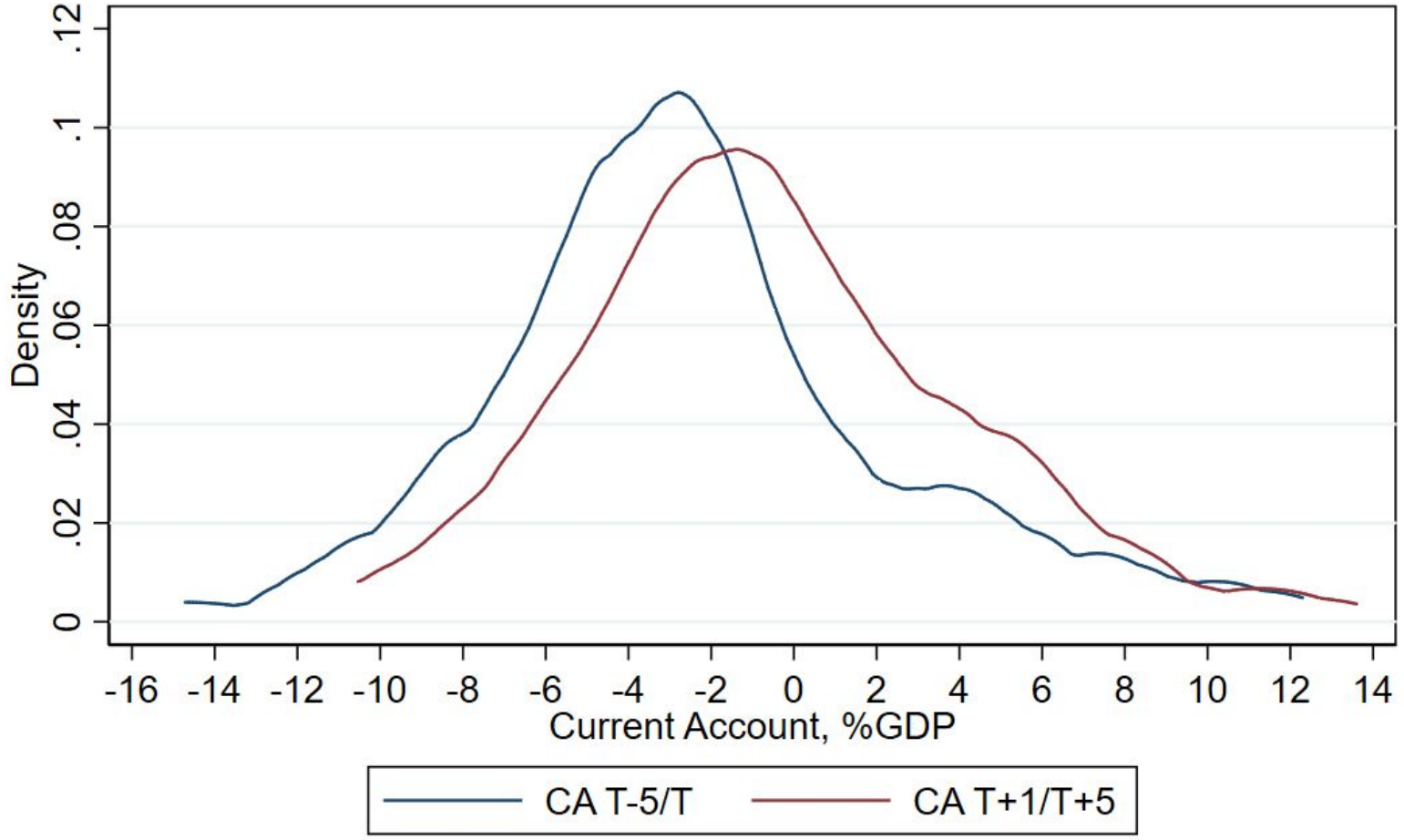
Current Account



Crises and Big Recessions: heterogeneities

Current Account

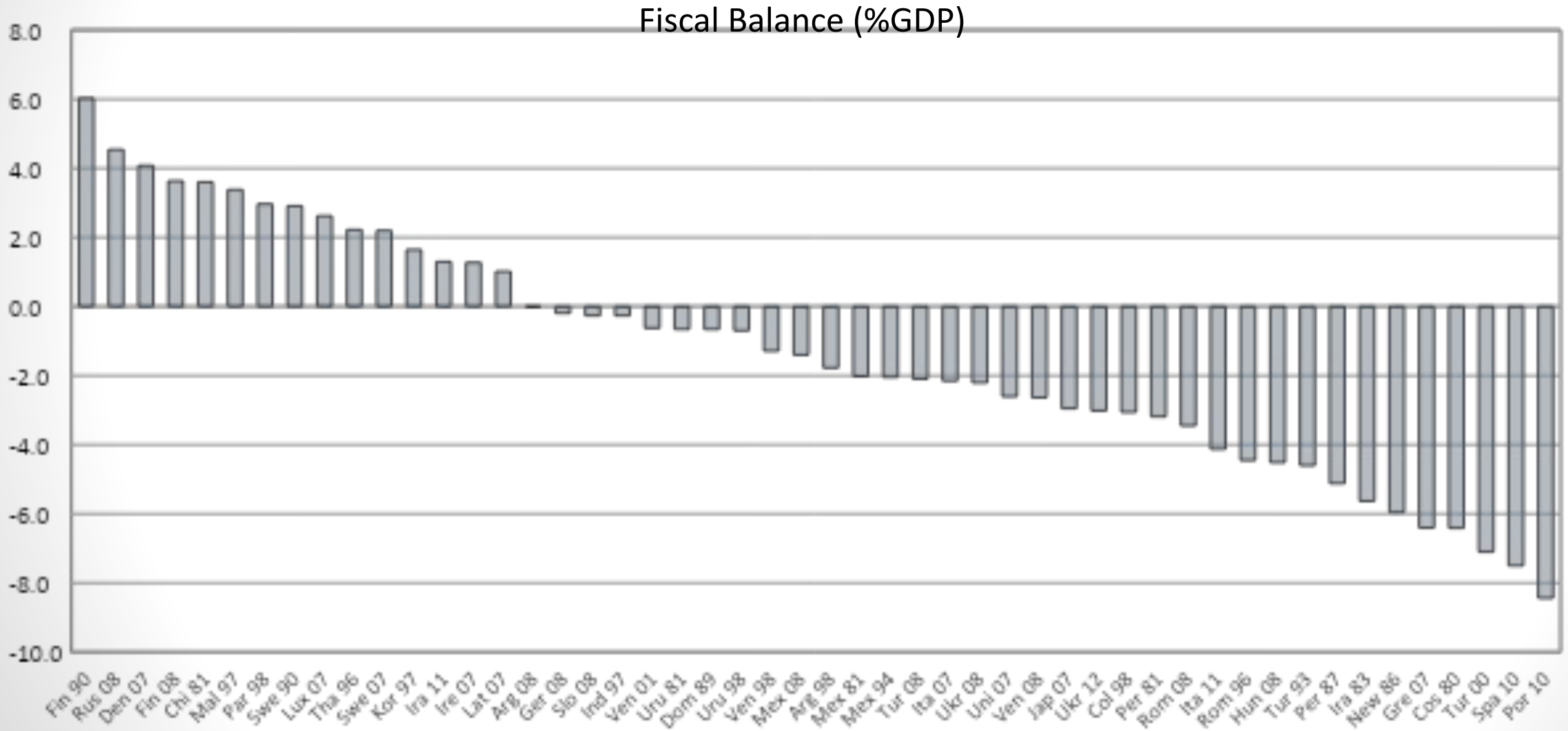
Current Account (%GDP) Before and After Big Recessions



Kuwait 1982 and Lebanon 1990 are excluded from this sample.

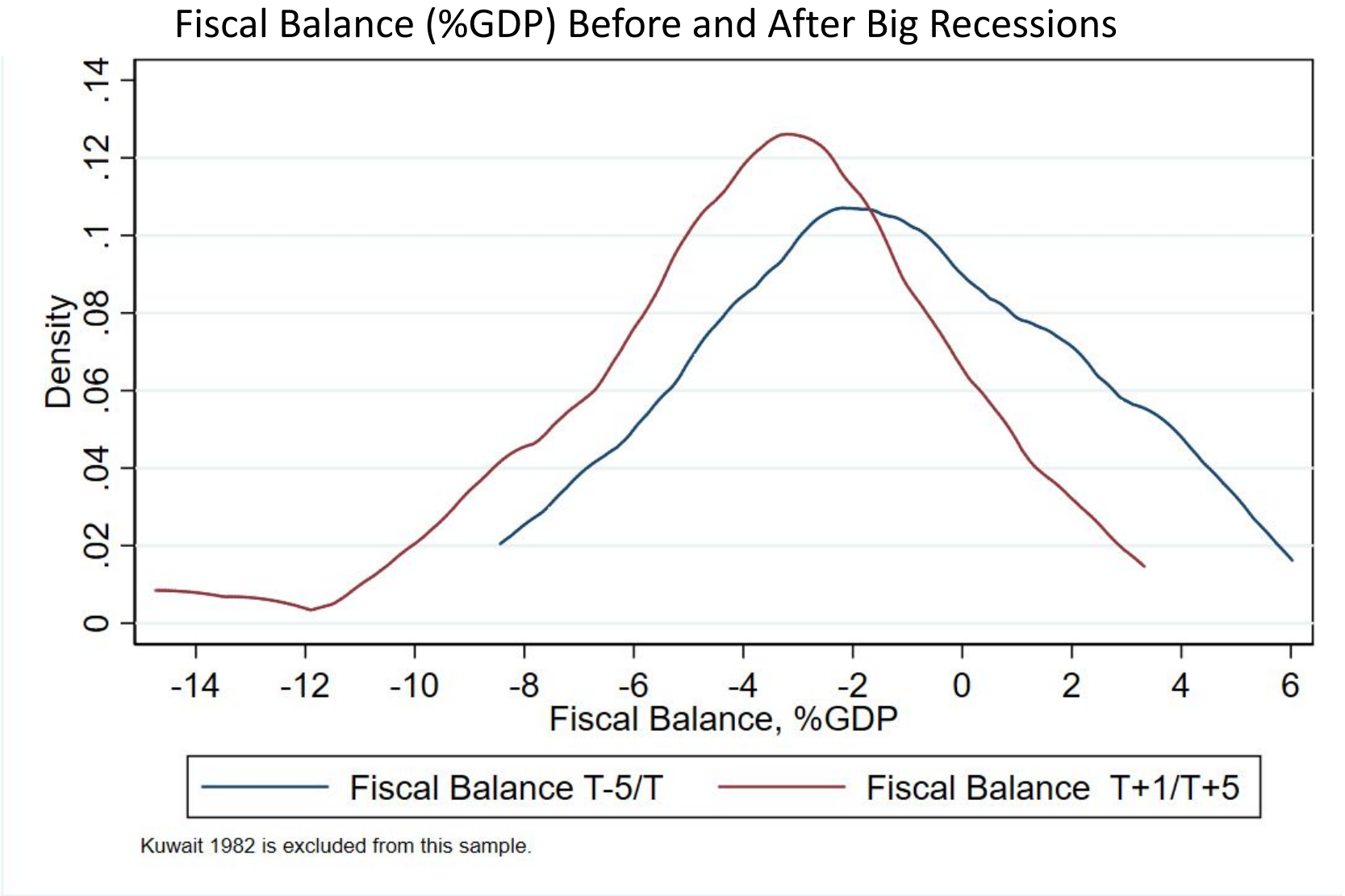
Crises and Big Recessions: heterogeneities

Fiscal Balance



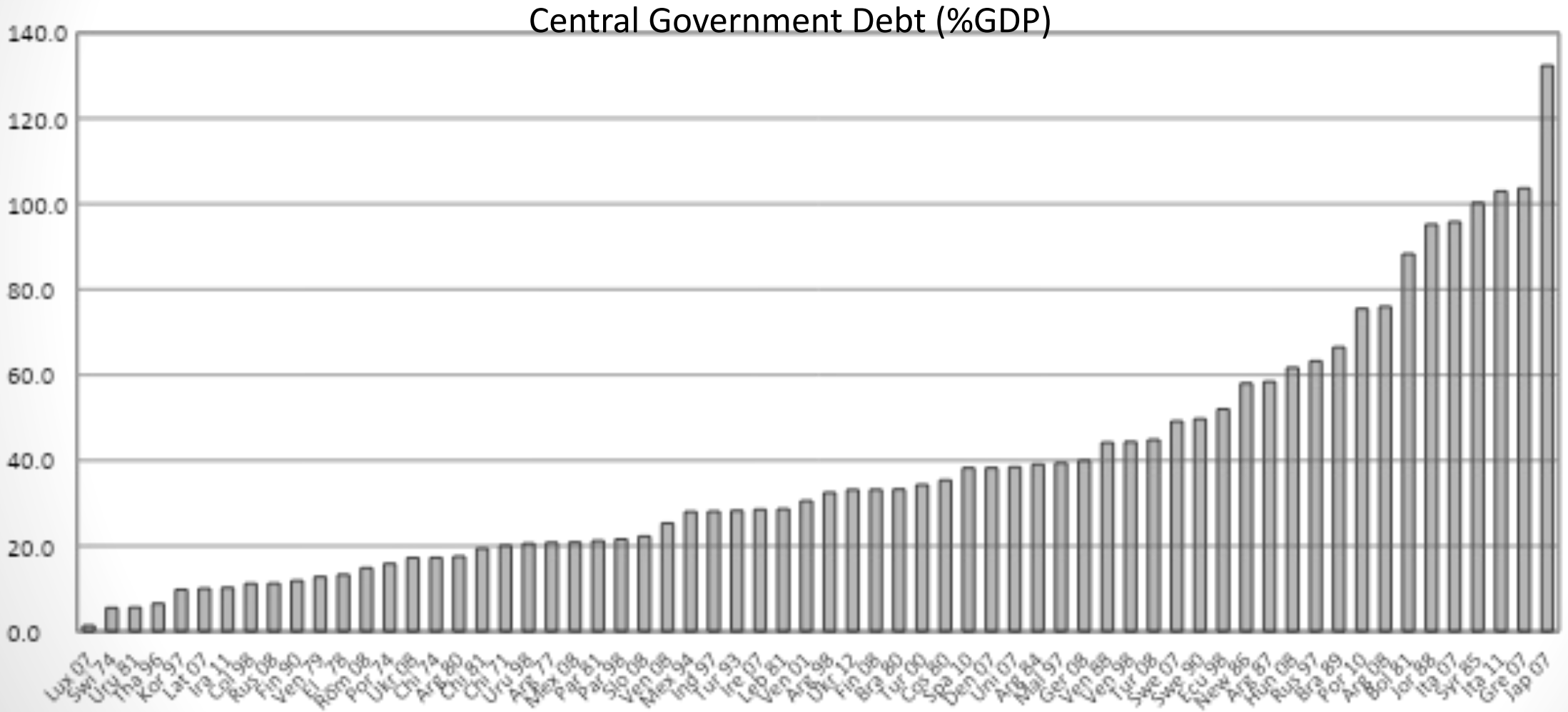
Crises and Big Recessions: heterogeneities

Fiscal Balance



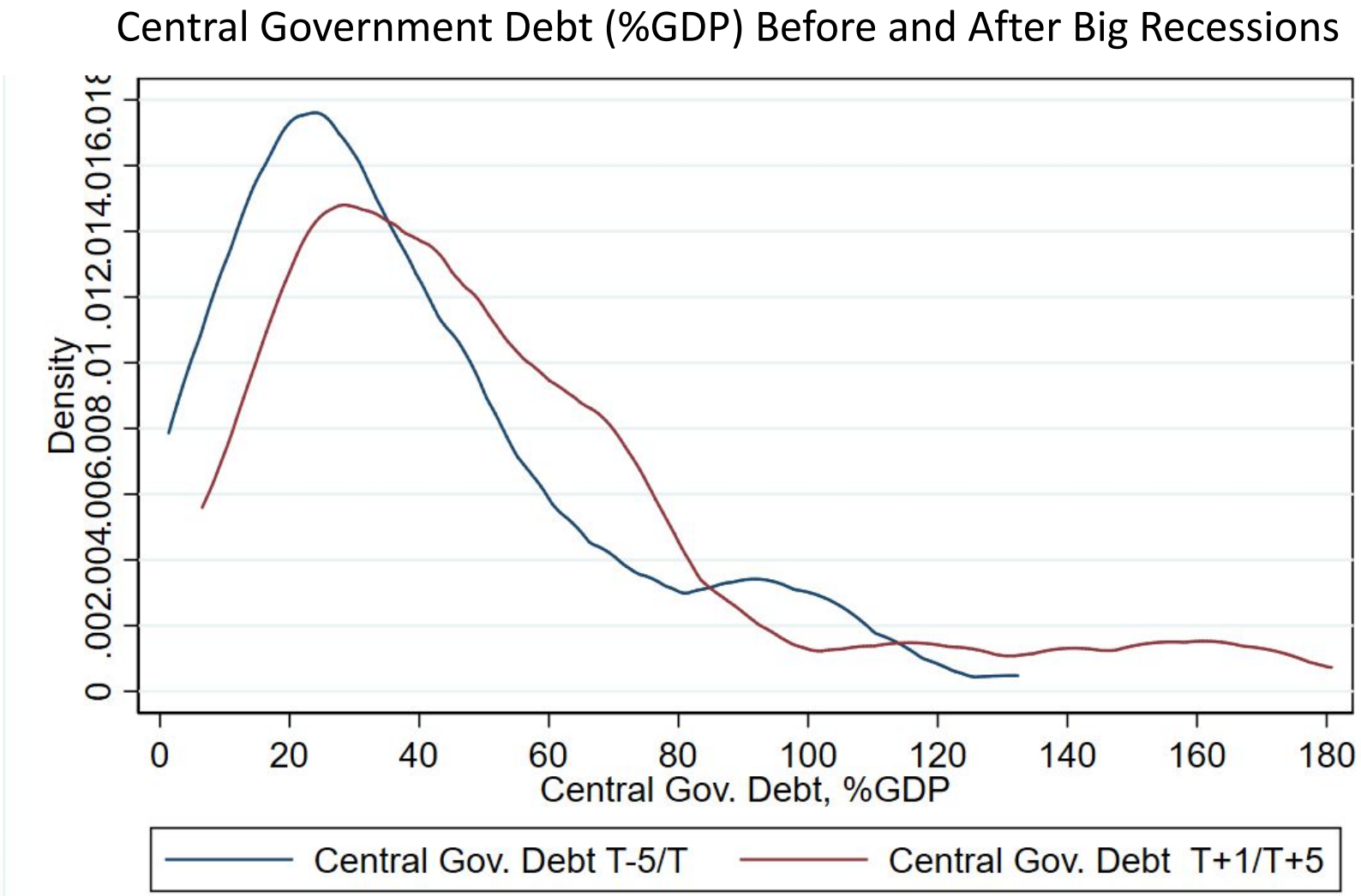
Crises and Big Recessions: heterogeneities

Central Governmetn Debt



Crises and Big Recessions: heterogeneities

Central Governmetn Debt



A family of events

- Specificities of various episodes: natural that *“no two crises alike”.*

- But: common elements,
  - Large accummulated output losses;
  - Often economy remains well below past trends (questions about causation).

A family of events
General Features

- *Memorable* episodes, marked by widespread difficulties in debt repayment.
- High perceived social costs, large changes in plans and expectations before and after crisis erupts; occasion for *search for lessons.*
- Shared features: wealth losses, unfulfilled contracts, *broken promises,* large falls in productivity without obvious *"extra- economic"* shock.

A family of events
General Features

- Macro policies, specific configuration of financial system, incentive problems, relevant in their ways for development of crisis, but general operative factor seems different:
  - Wealth misperceptions, through financial and spending channels.

- Consequences for policy:
  - Planning for the event of next crisis, would differ (in not easily predictable forms) from past ones.

A family of events
General Features

- Interactions between growth trends and large macro fluctuations.
- Problems of intertemporal coordination induced by difficulties in predicting real incomes over relatively long horizons.

- Implicit: future growth performance hard to predict, especially if relevant “innovations” (technology, institutions, international conditions) modify context of decisions.

A family of events
General Features

- Topics:
  - Variable trends and debt cycles.
  - Sustainability. Issues in determining precise notion; evaluations as forward-looking exercises in evolving systems (relevant “fundamentals” are prospective by nature). Sustainability analysis implies contrasting the expectations of the analysts with those that drive behavior of agents.

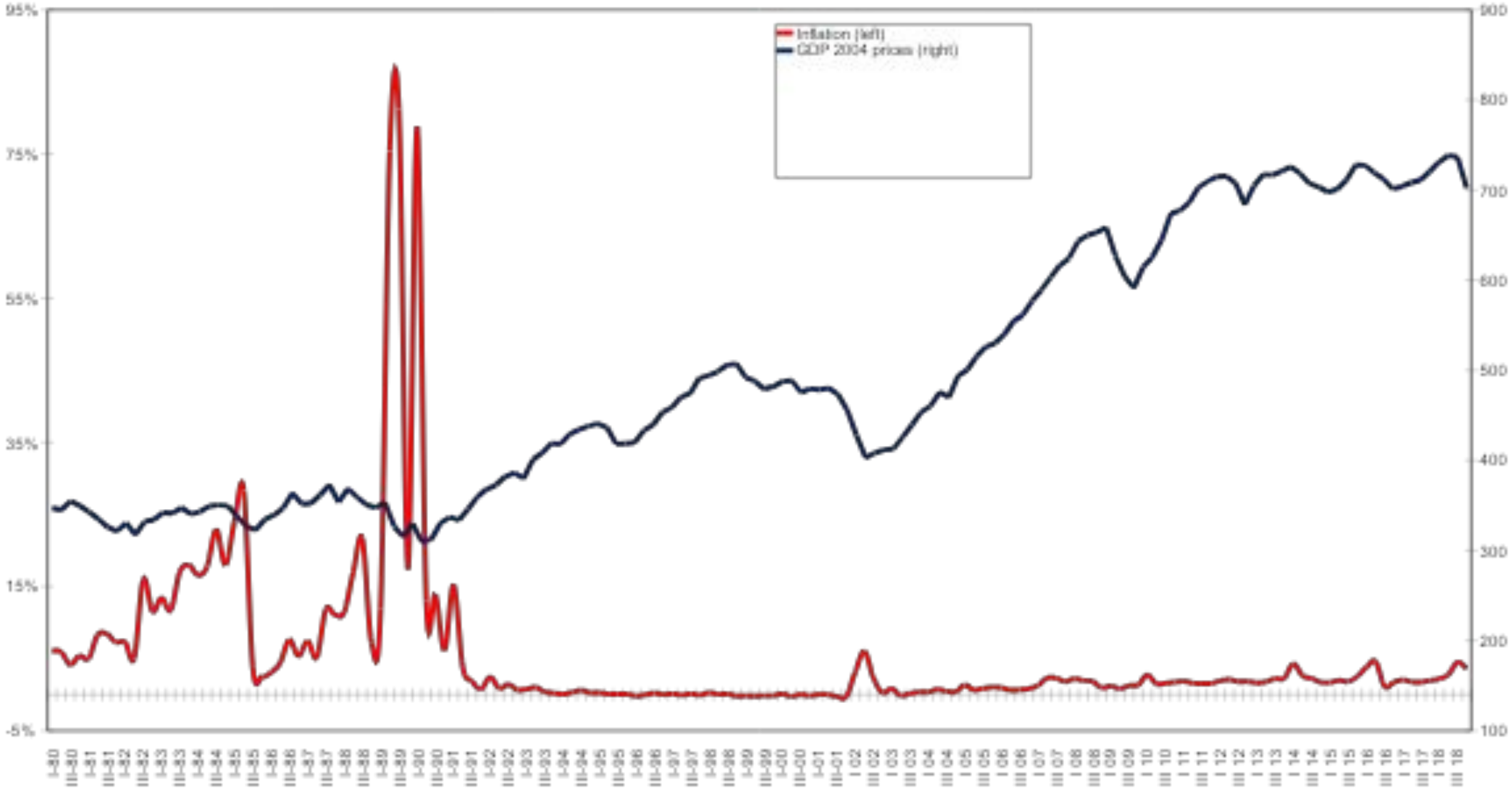
A family of events
General Features

- Crises imply re-evaluation of trends, growth potential of incomes, repayment capacities.

- Overexpansions of credit and spending not necessarily motivated by "eccentric" beliefs:
  - Expectations may correspond to currently prevailing theories/ opinions.

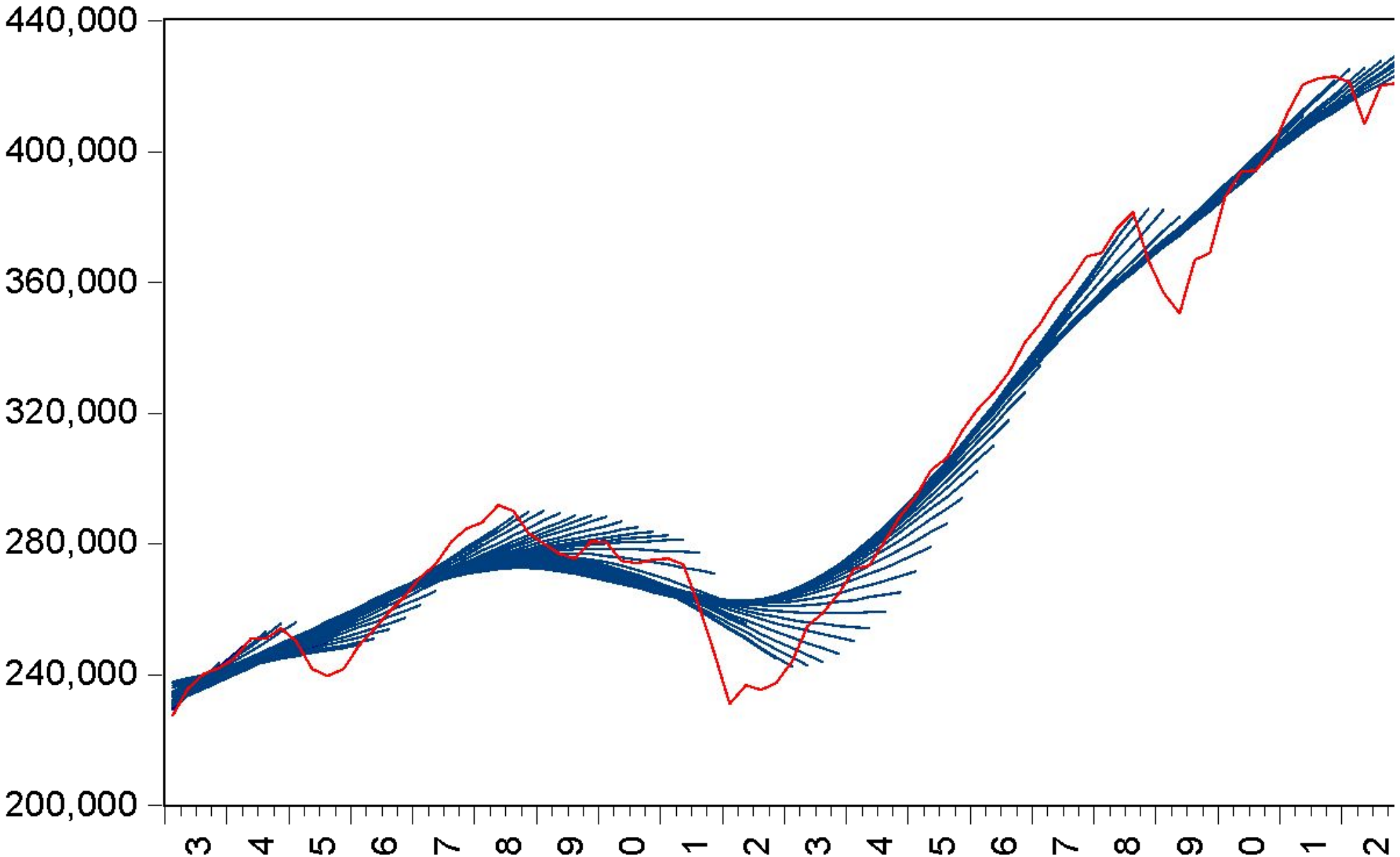
- Crucial to represent expectation dynamics, intertemporal choices, propagation effects between agents/markets. Much room for exploration.

GDP at constant prices and CPI inflation rates



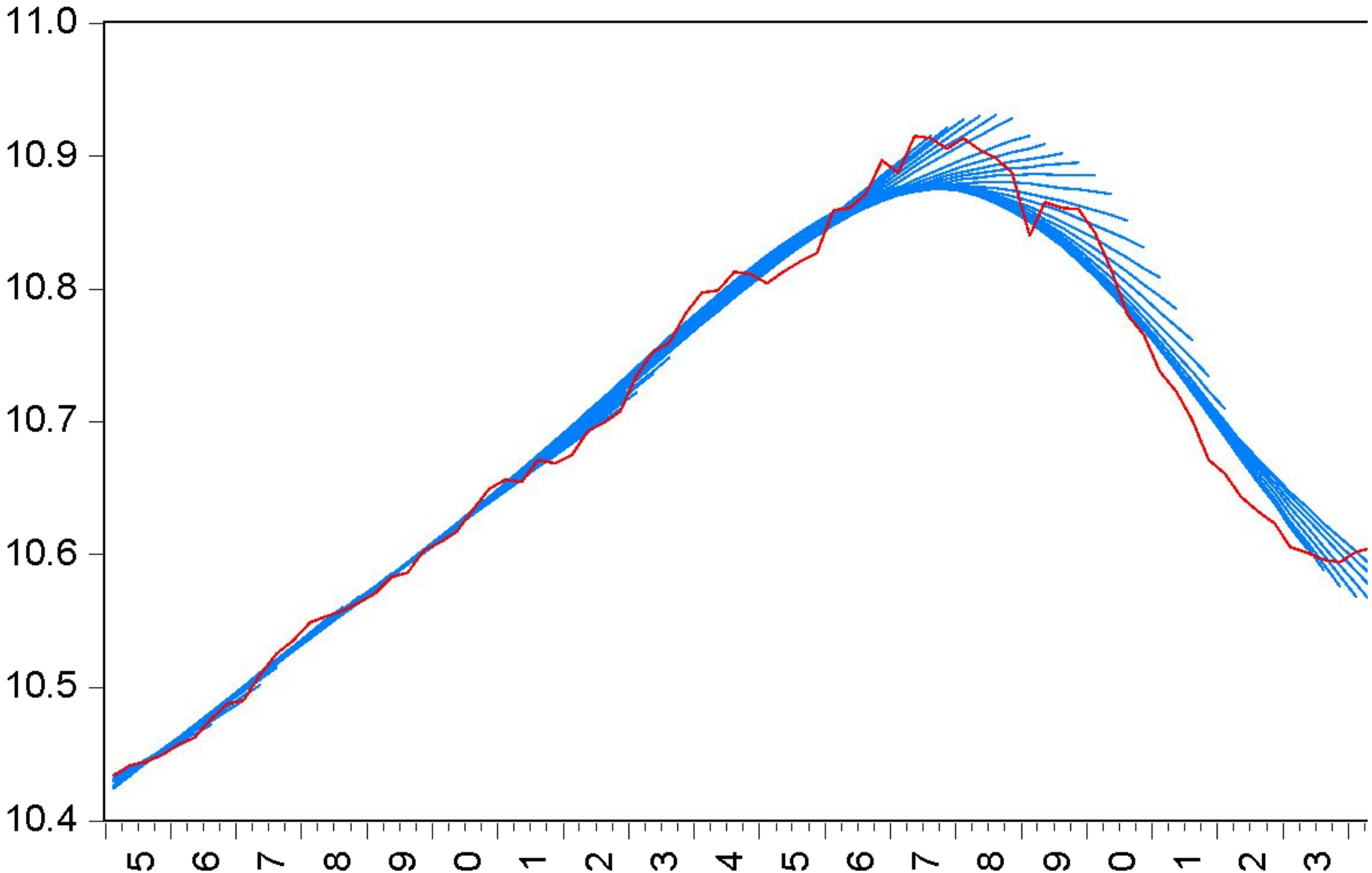
Argentina

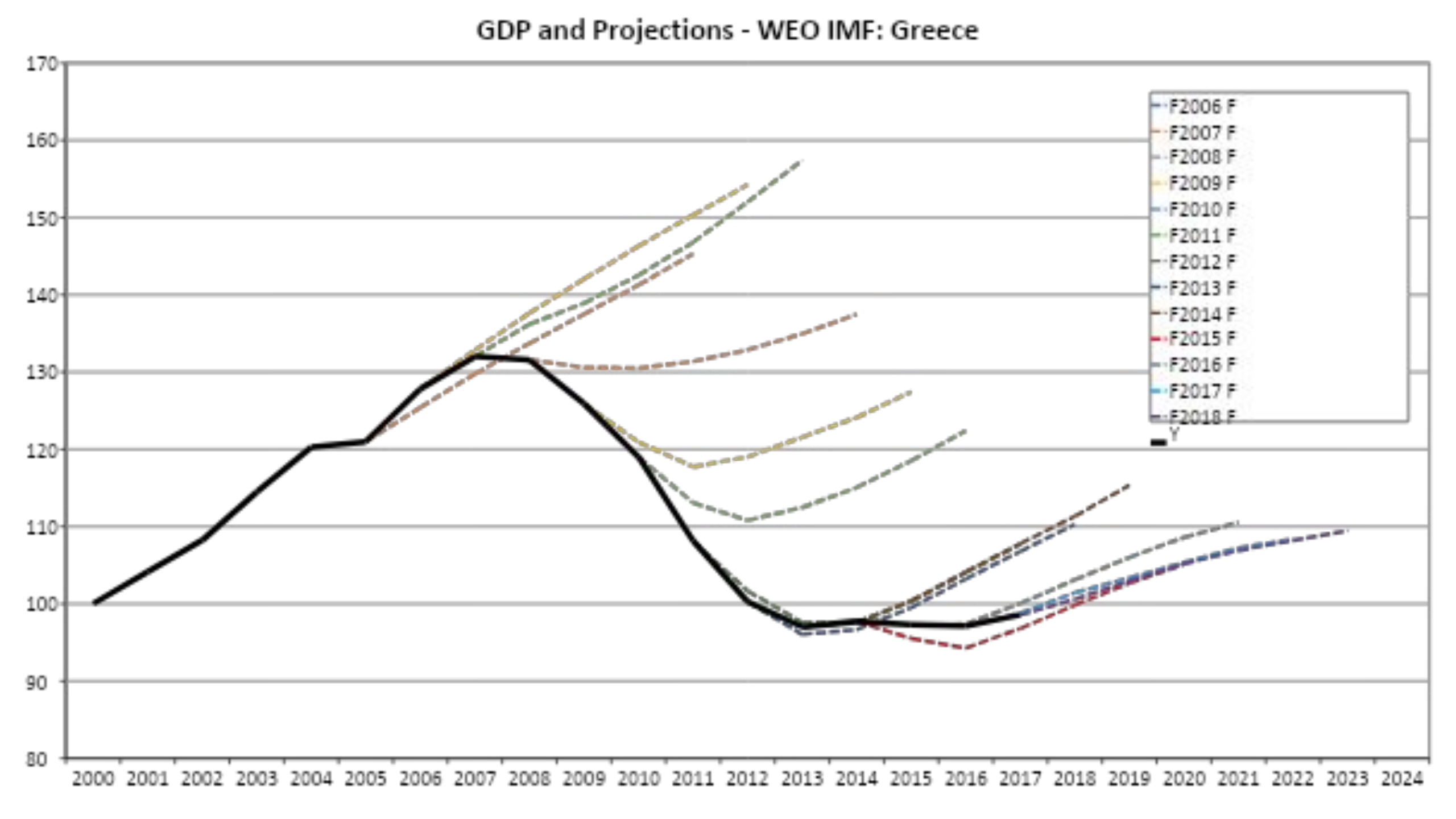
(GDP and Recursive HP)

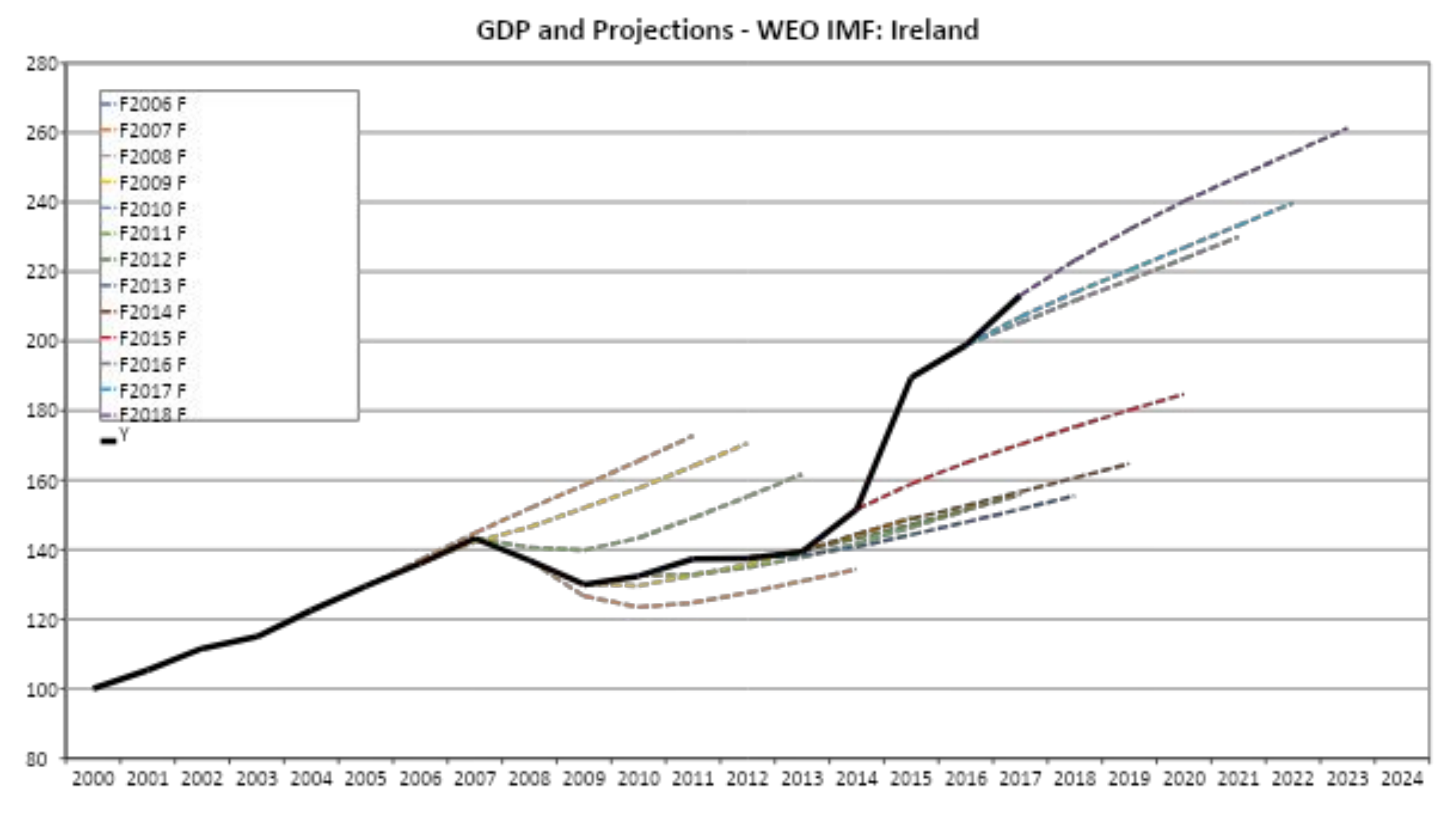


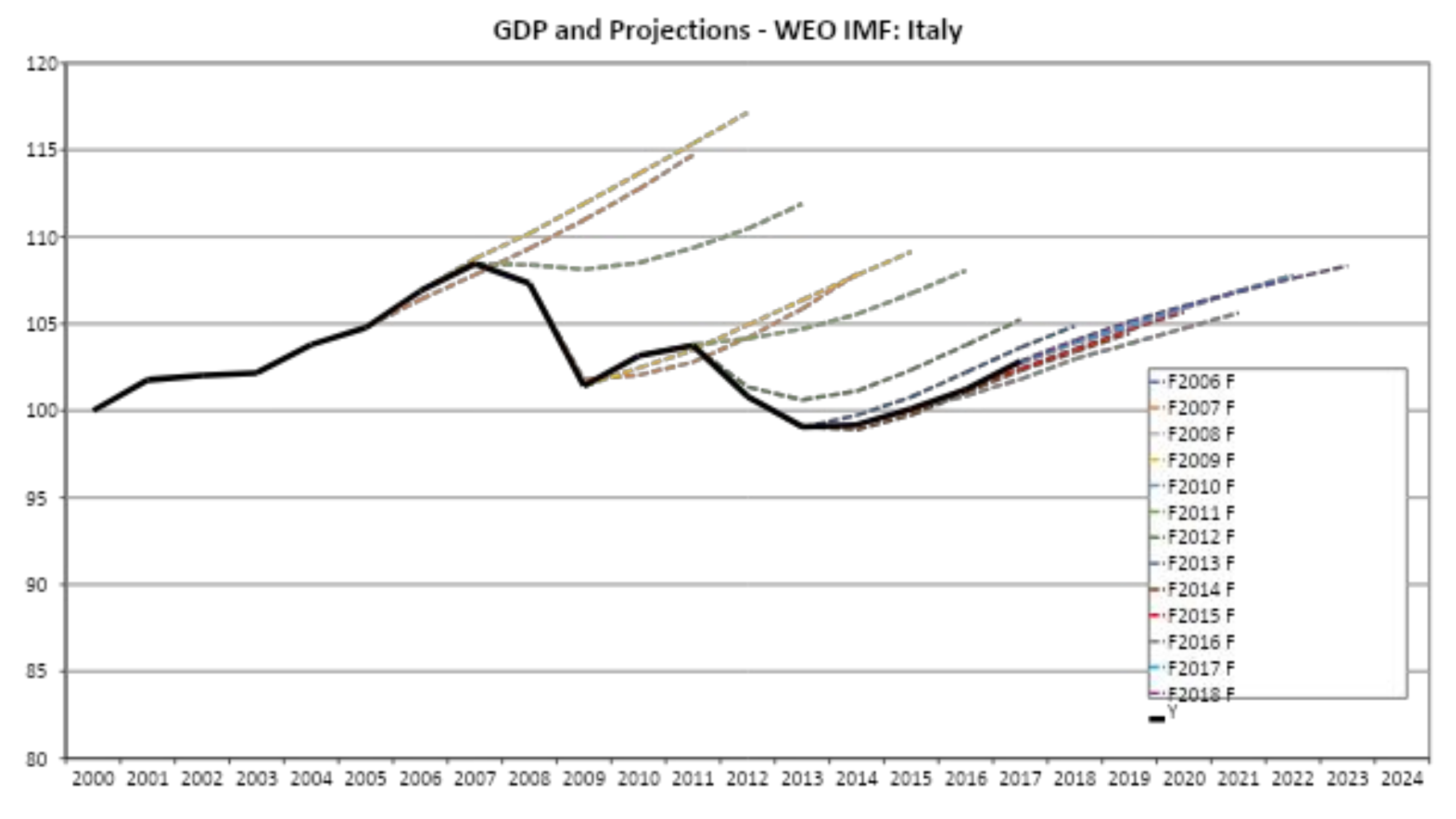
Greece

(Log GDP and Recursive HP)




GDP and Projections - WEO IMF: Greece
170
160
150
140
130
120
110
100
90
80
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
F2006 F
F2007 F
F2008 F
F2009 F
F2010 F
F2011 F
F2012 F
F2013 F
F2014 F
F2015 F
F2016 F
F2017 F
F2018 F
Y


GDP and Projections - WEO IMF: Ireland
F2006 F
F2007 F
F2008 F
F2009 F
F2010 F
F2011 F
F2012 F
F2013 F
F2014 F
F2015 F
F2016 F
F2017 F
F2018 F
Y
280
260
240
220
200
180
160
140
120
100
80
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024


GDP and Projections - WEO IMF: Italy
120
115
110
105
100
95
90
85
80
2000
2001
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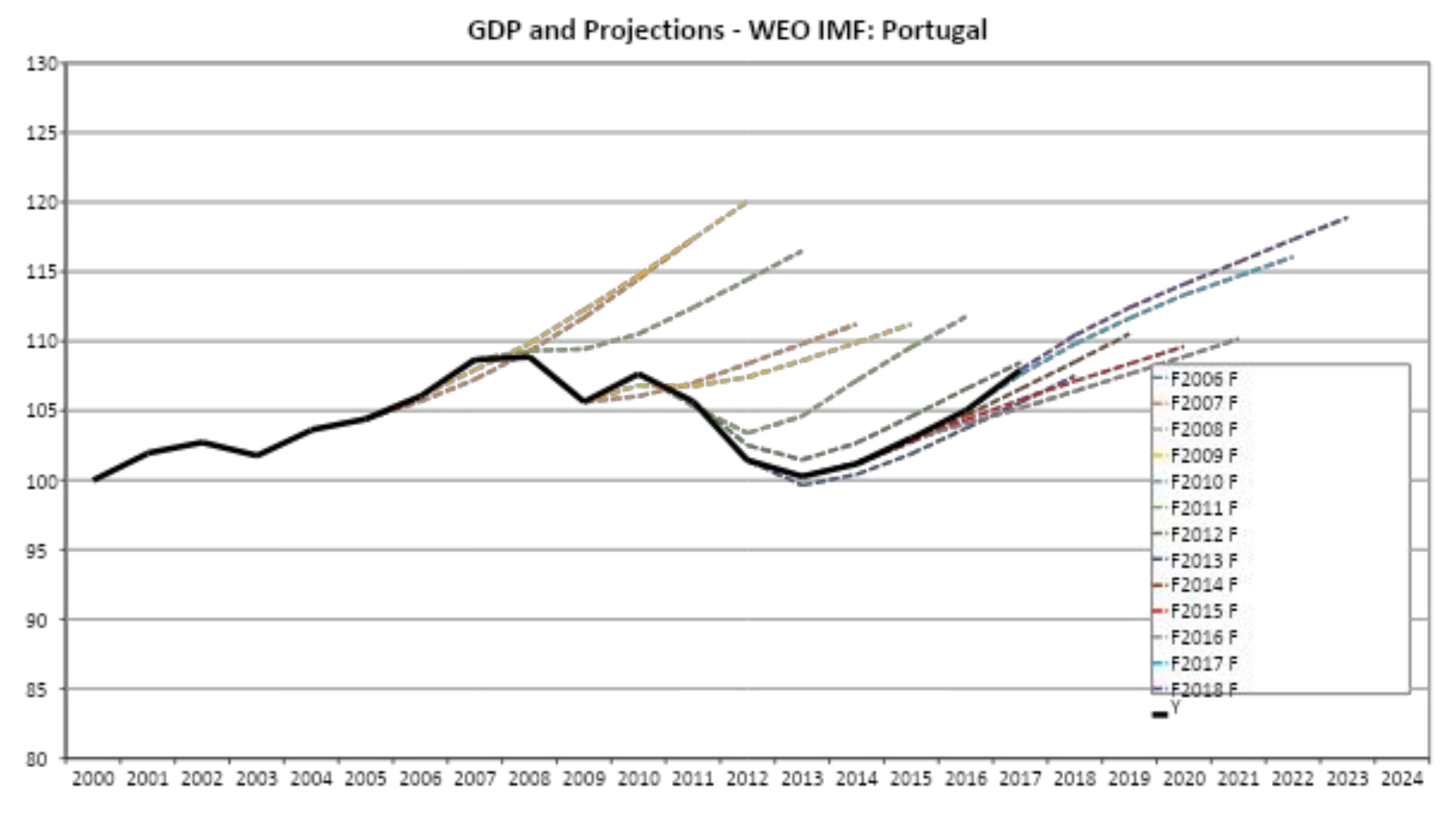
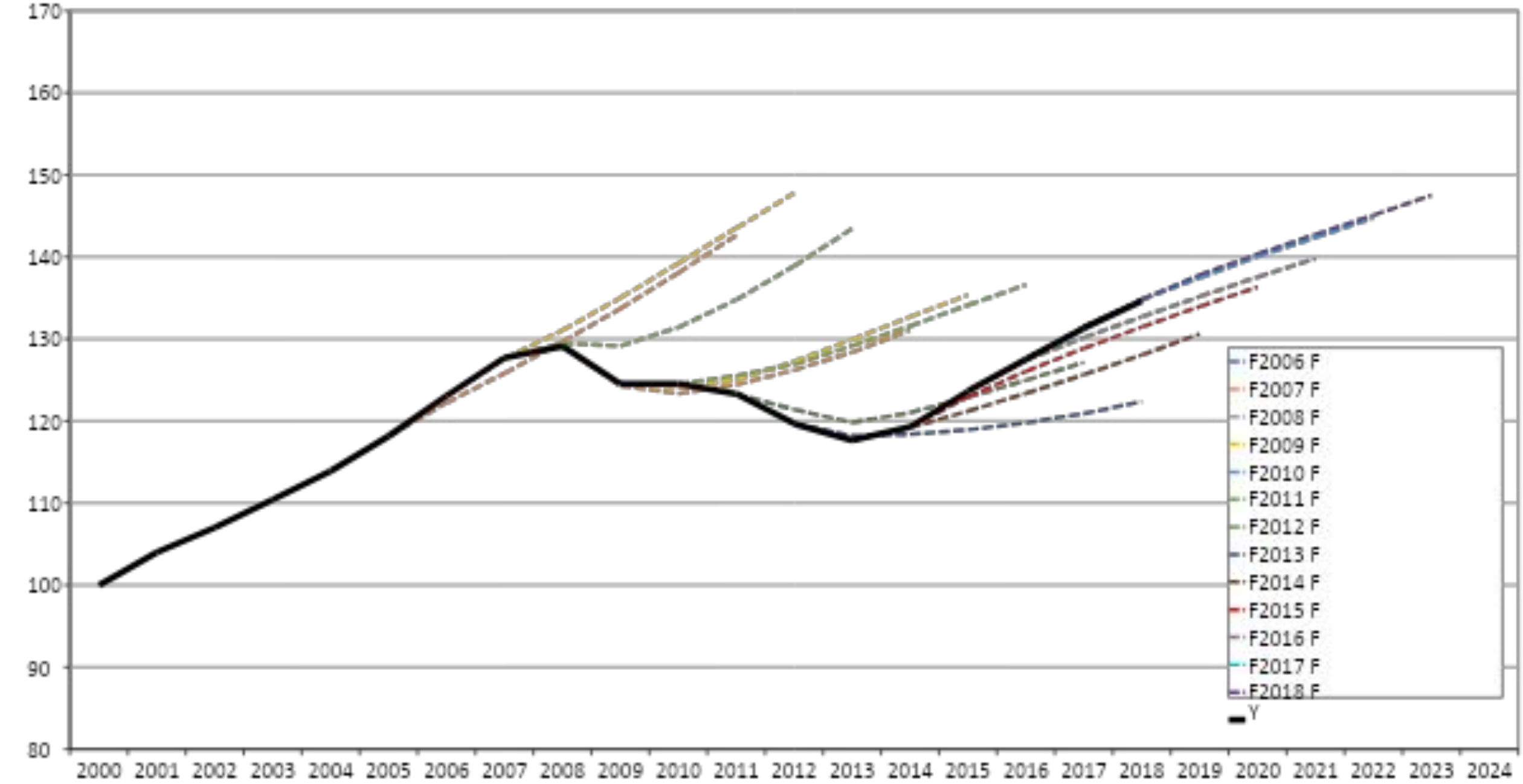
2021
2022
2023
2024
F2006 F
F2007 F
F2008 F
F2009 F
F2010 F
F2011 F
F2012 F
F2013 F
F2014 F
F2015 F
F2016 F
F2017 F
F2018 F
Y


GDP and Projections - WEO IMF: Portugal
130
125
120
115
110
105
100
95
90
85
80
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
F2006 F
F2007 F
F2008 F
F2009 F
F2010 F
F2011 F
F2012 F
F2013 F
F2014 F
F2015 F
F2016 F
F2017 F
F2018 F
Y

GDP and Projections - WEO IMF: Spain



A family of events
General Features

- Solvency problems may appear in public or private sectors, with potential propagation.
- Big recessions and financial crashes, prompting governments to absorb bad debts may be sources of fiscal troubles in various instances (even if previous fiscal positions seemingly solid).
- In turn, fragile public finances impact private sector in several ways: unforeseen adjustments in taxes, government spending, falls in asset prices and financial disturbances, inflation.

A family of events
General Features

Processes at different time scales, coupled:

- At some moments:
  - Relevance of day-by-day news, especially in financial markets.
  - Perceptions of system near *bifurcation;*
  - Actions decided *on the spot* with potentially lasting effects.

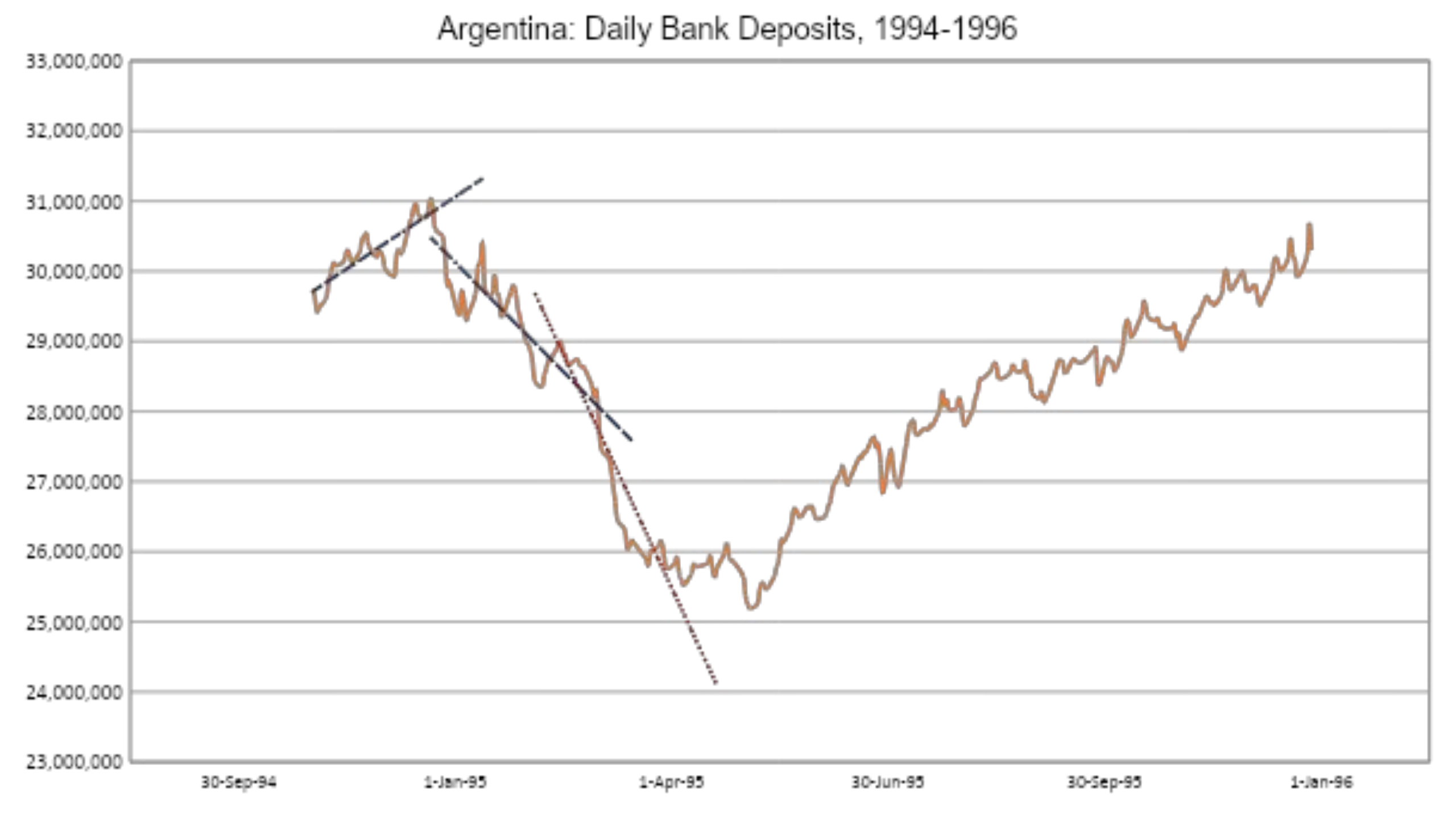
- Movements in aggregate real activity, employment:
  - Large fluctuations over months, quarters.

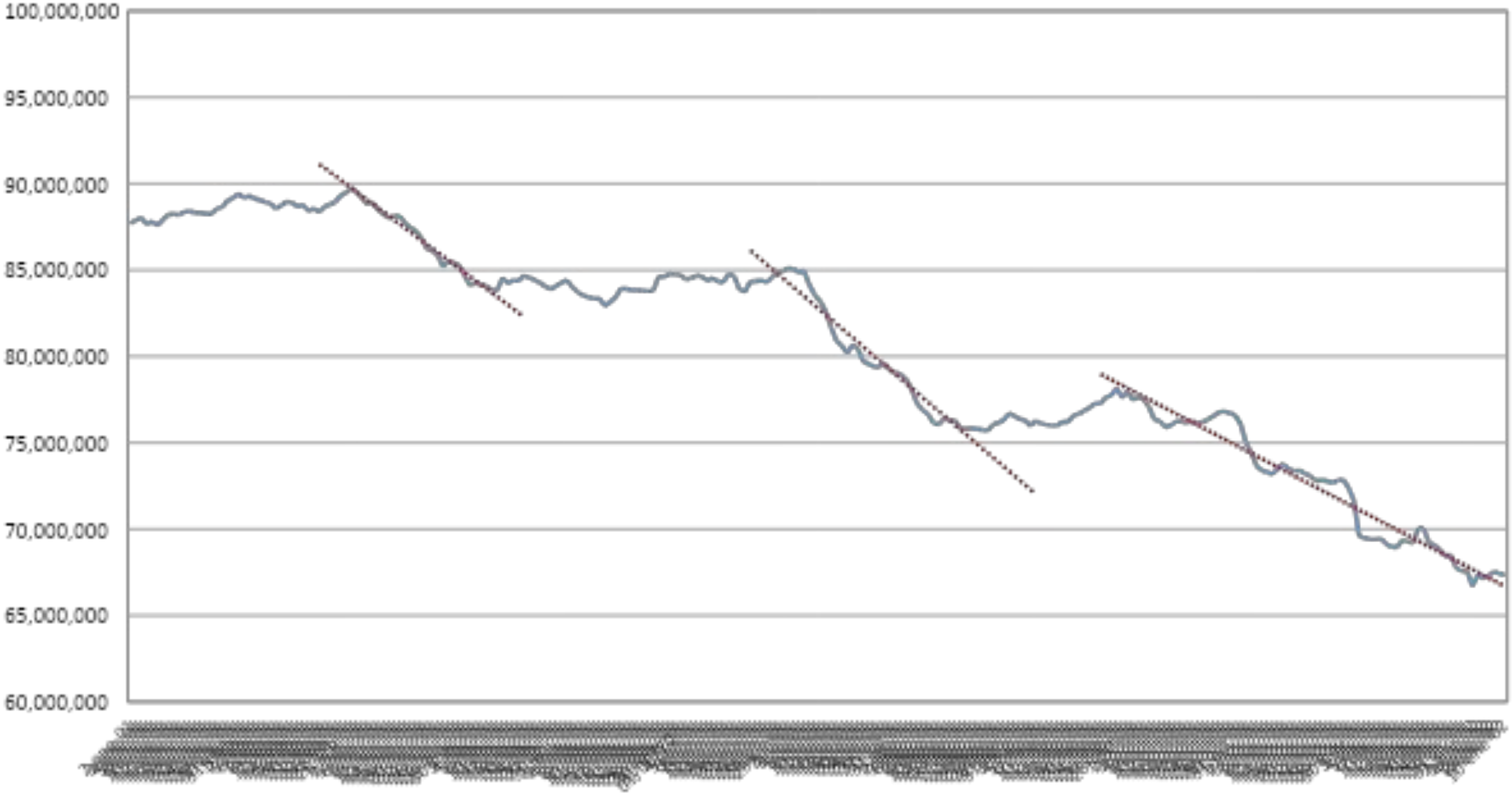
- Longer-run effects:
  - Changes in balance sheets: wealth levels; distribution; attitudes and behaviors in goods, asset markets; shifts in policies and institutions.
  - Changes in beliefs: possible reversals in burden of proof of macro arguments; return of old debates.

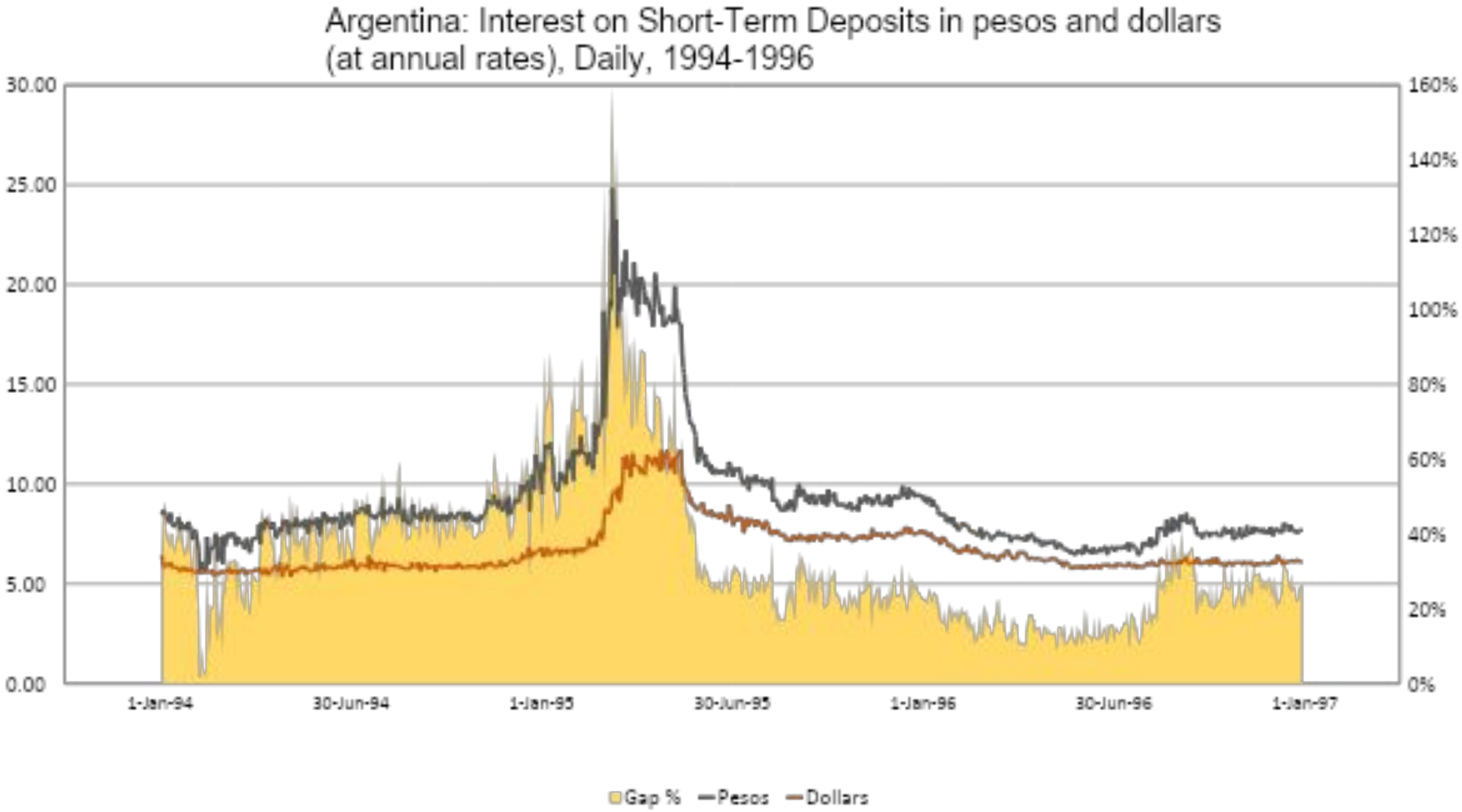
A family of events
General Features

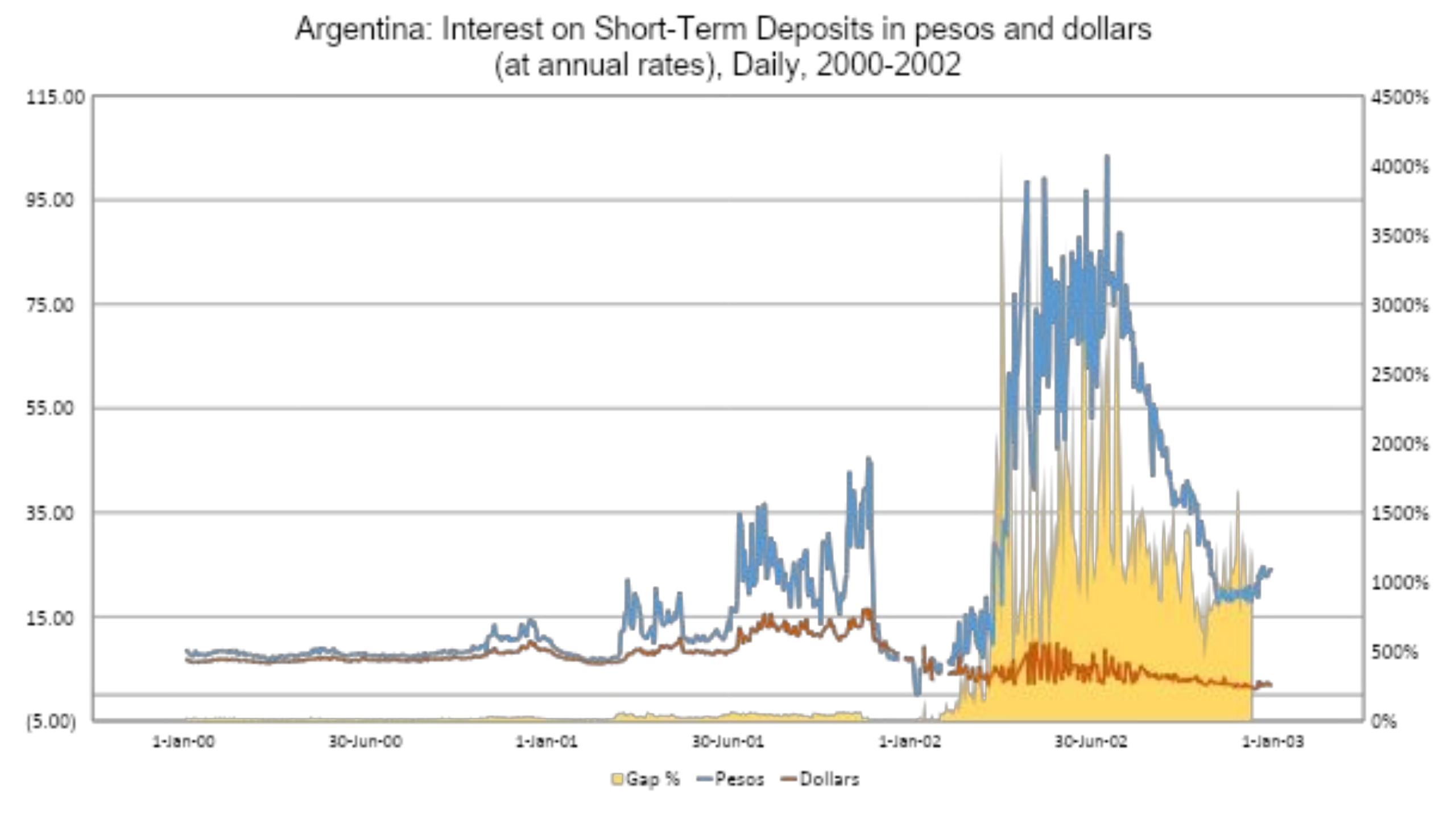
- Crises marked by abrupt transitions in perceptions and behaviors. As if at some point switches in burden of proof regarding solvency. Relevance of higher-order beliefs.

- When expectations *“on the other side”,* difficult to bring back. Urgent concern about exit by asset holders may become central focus for policies.


Argentina: Daily Bank Deposits, 1994-1996
33,000,000
32,000,000
31,000,000
30,000,000
29,000,000
28,000,000
27,000,000
26,000,000
25,000,000
24,000,000
23,000,000
30-Sep-94
1-Jan-95
1-Apr-95
30-Jun-95
30-Sep-95
1-Jan-96


Argentina: Daily Bank Deposits, 2001-2002
100,000,000
95,000,000
90,000,000
85,000,000
80,000,000
75,000,000
70,000,000
65,000,000
60,000,000


Argentina: Interest on Short-Term Deposits in pesos and dollars
(at annual rates), Daily, 1994-1996
30.00
25.00
20.00
15.00
10.00
5.00
0.00
160%
140%
120%
100%
80%
60%
40%
20%
0%
1-Jan-94
30-Jun-94
1-Jan-95
30-Jun-95
1-Jan-96
30-Jun-96
1-Jan-97
Gap %
Pesos
Dollars


Argentina: Interest on Short-Term Deposits in pesos and dollars
(at annual rates), Daily, 2000-2002
115.00
95.00
75.00
55.00
35.00
15.00
(5.00)
4500%
4000%
3500%
3000%
2500%
2000%
1500%
1000%
500%
0%
1-Jan-00
30-Jun-00
1-Jan-01
30-Jun-01
1-Jan-02
30-Jun-02
1-Jan-03
Gap %
Pesos
Dollars


Argentina: International Reserves, Monthly, 1994-1996 (millions of usd)
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
Jan-94
Feb-94
Mar-94
Apr-94
May-94
Jun-94
Jul-94
Aug-94
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Oct-94
Nov-94
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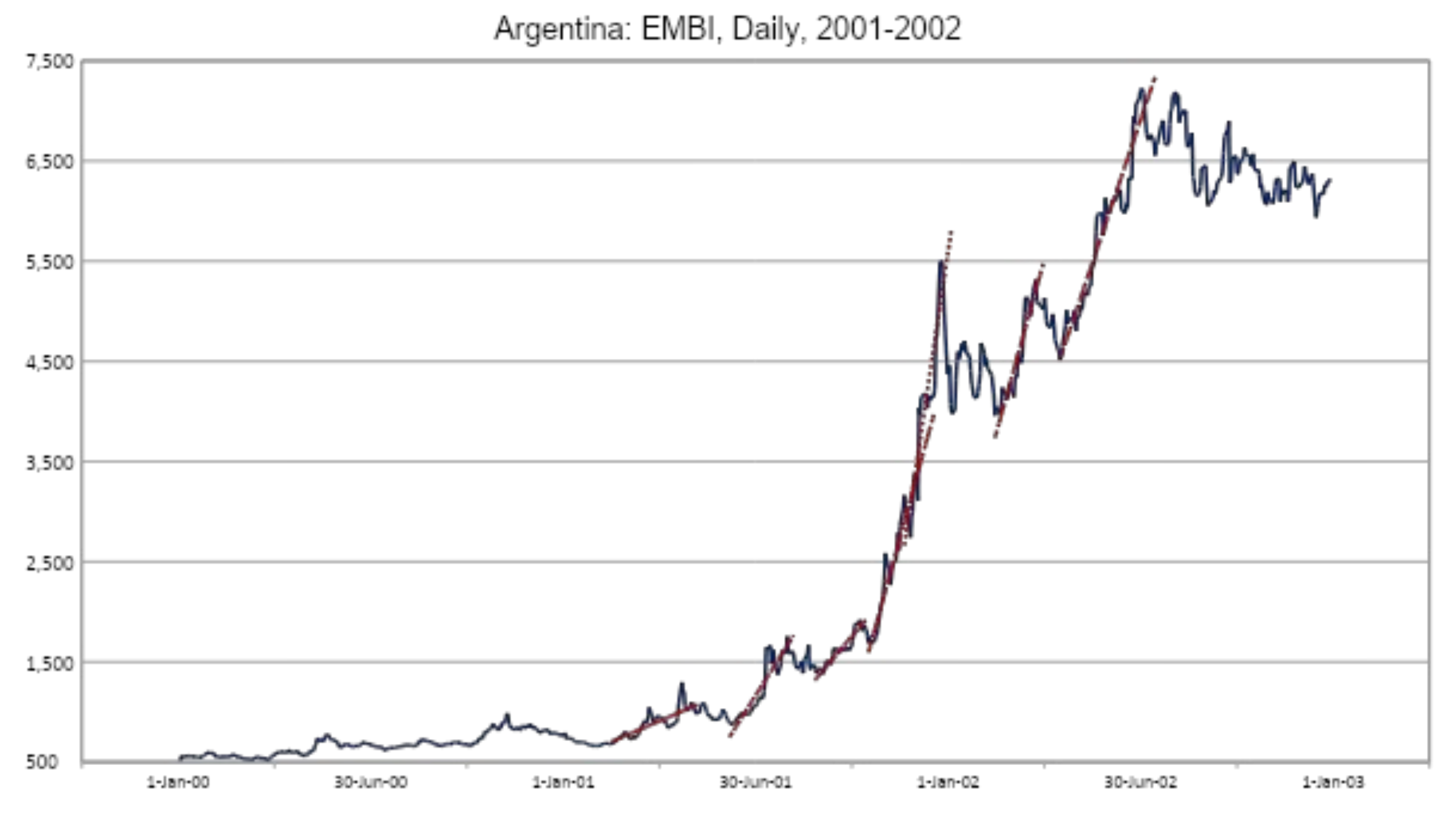
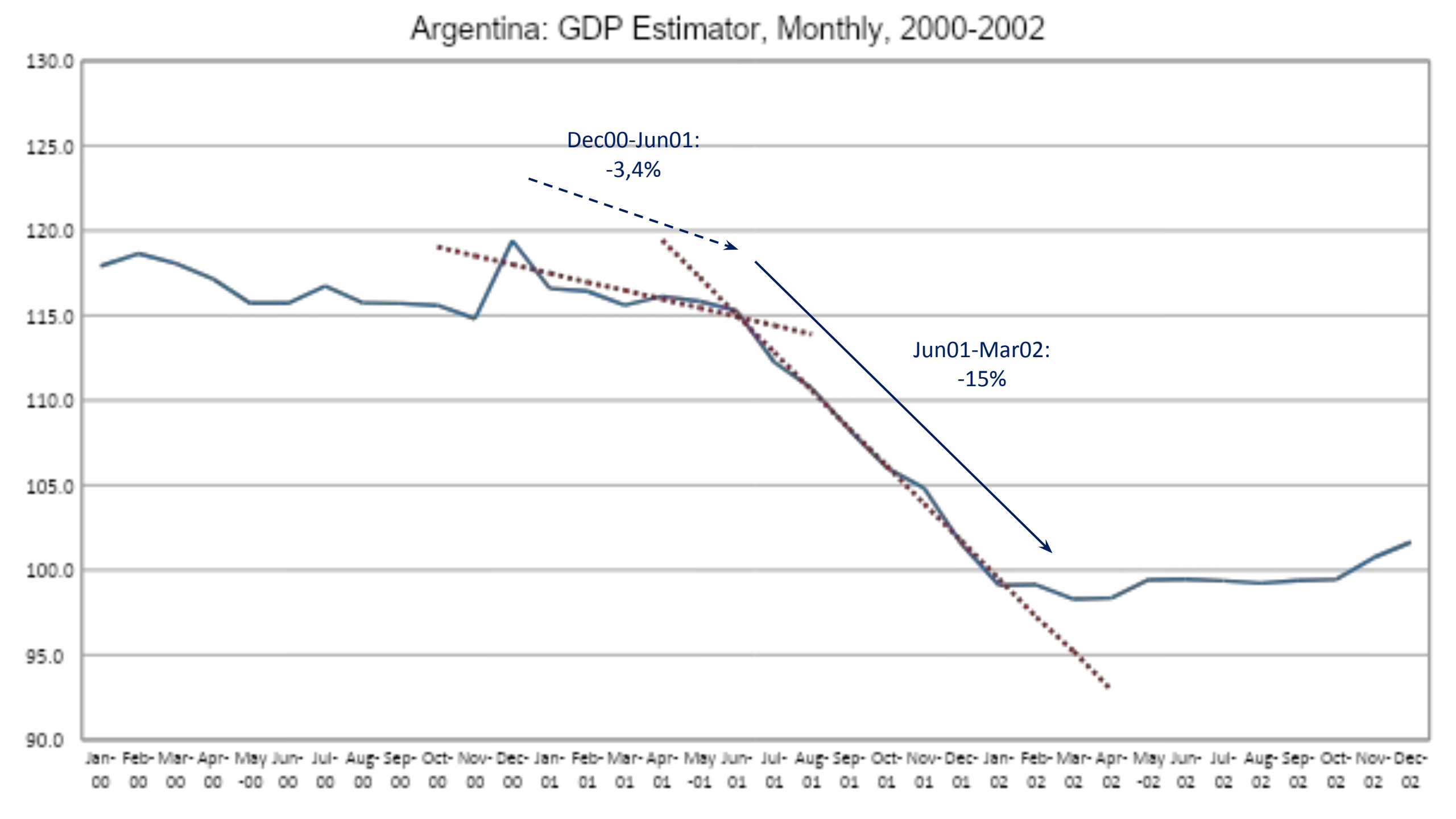
Dec-96


Argentina: EMBI, Daily, 2001-2002
7,500
6,500
5,500
4,500
3,500
2,500
1,500
500
1-Jan-00
30-Jun-00
1-Jan-01
30-Jun-01
1-Jan-02
30-Jun-02
1-Jan-03


Argentina: GDP Estimator, Monthly, 2000-2002
Dec00-Jun01:
-3,4%
Jun01-Mar02:
-15%
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
90.0
Jan-00 Feb-00 Mar-00 Apr-00 May-00 Jun-00 Jul-00 Aug-00 Sep-00 Oct-00 Nov-00 Dec-00 Jan-01 Feb-01 Mar-01 Apr-01 May-01 Jun-01 Jul-01 Aug-01 Sep-01 Oct-01 Nov-01 Dec-01 Jan-02 Feb-02 Mar-02 Apr-02 May-02 Jun-02 Jul-02 Aug-02 Sep-02 Oct-02 Nov-02 Dec-02

Trends, cycles, crises

- Incentive problems typically visible in crises: fraud, moral hazard from expected bailouts, biased advice. But crisis requires error somewhere, and probably, of a non- trivial kind:

"When it is too late, the dupes discover scandals…But probably these frauds could never have become so great without the original starters of real opportunities to invest lucratively. There is always a very real basis for the 'new era' psychology before it runs away with all its victims" (I. Fisher, 1933).

Trends, cycles, crises

- Learning about trends as source of fluctuations, especially when indications of structural change.

- General problem, both analytical and practical:
  - *"Making statistics out of history".* What is relevant sample?
  - Practical matter: what "insurance" to buy and at what price for what event…

Trends, cycles, crises

- Structure of the economy evolving. Time-varying parameters. Learning does not converge to “true values”:
  - When add more observations, old data become obsolete.
  - The size of the useful sample does not tend to infinity; priors never go away (Weitzman, 2007).
  - Learning with no end in sight, with concrete macro implications.

Remarks

- Large-scale events that put into question defining features of economic organization and behavior. Raise major questions for macro analysis and policy design.

- When crises erupt: far-reaching decisions under pressure and uncertainty. Tradeoffs between cautious approach and “resetting system”; scarcity of dependable criteria on which to rely.

- Dealing with emergencies and looking ahead. Beyond “competition of approaches” (sign of lack of firm knowledge), interest in considering ranges of relevance of modes of analysis.

Remarks

- Macro requires framework(s) and models to analyze interrelated behavior of multiple agents in intertemporal setups; transmission mechanisms (implications of configuration of networks of trade, debts).

- Models of well coordinated optimal behavior (GE) where agents form expectations in correspondence with the stochastic environment they collectively generate (DS, as is understood), given assumed “frictions”, can hardly deal with large- scale coordination failures (cf. Sargent 2010; models of Great- Moderation vintage not suited for representing crises). Expectational failures have to be addressed in some form.

On RE modeling

- Literature has explored alternative ways of representing expectations (extrapolative schemes and various heuristics, statistical learning, behavior under model uncertainty…).
  - But RE in center of macro analysis for decades, and still going.

- Crises certainly put under serious question pertinence of RE assumptions. But also, issues with the logic of RE as analytical construct.

- Simple, straightforward argument. Premises : (i) existing models cannot claim status of “true models” (if not, activity on field completely futile); (ii) incumbent models have evolved and will continue to evolve.

- Failure to recognize obvious facts led to confusion between the provisional model model that analyst proposes currently and the engine that knowledgeable agents have used in the past and will use in the future to form expectations.

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On RE modeling

- Seminal contribution by Muth (1961):

  "Expectations of firms (or more generally the subjective distribution of outcomes) tend to be distributed, for the same information set, about the prediction of the theory (or the ´objective´ distribution of outcomes)

- Two different meanings: *"prediction of theory"* and *"objective distribution".* Cannot be assimilated with one another.

- Corollary: the following cannot be sustained:

  "A rational expectations equilibrium is a fixed point of the mapping from the perceived law of motion to the actual law of motion … A rational expectations equilibrium asserts that the same model is shared vbi; (1) all the agents within a model, (2) the econometrician estimating the model and (3) nature, aka the data generating mechanism". (Sargent, 2008).

On RE modeling

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- Then: RE with at least two meanings;
  - $RE1$: $PLM = ALM$; or
  - $RE2$: $PLM = MLM$,

  where MLM is the *"model law of motion"* (no business here with higher order expectations), and one should carefully consider to which construct in the history of thought the postulated correspondence refers when contemplating expectations formed at a certain date.

On RE modeling

Consistency issues with $RE1$

- Belief in $RE1$ implies accepting practical irrelevance of economic analysis.
- *(As if)* superior knowledge of agents relative to economist. Economist (E) who believes in $RE1$ should not represent expectations/actions of agents as derived from $E's$ "preferred model" but try to adapt model to perceptions/decisions of agents.
- E can certainly assume that model generates unbiased expectations, but should not assimilate *"true uncertainty"* with the stochastic terms in the (imperfect) model. $RE1$ agents would act as if aware of the irreducible randomness in the system, with no room for "measures of ignorance": the actual risks that they perceive are not those that the model would show.
- Then, model- consistency of expectations wouod not correspond to $RE1$. Trying to implement $RE1$ would require some conjecture about the ultimate sources of randomness not linked to cognitive limitations.

On RE modeling

Consistency issues with $RE2$

- Central question:
  - Meaning of model- consistency when applied to expectations formulated in the past. Should they correspond to the current model (as typically assumed without question) or to the model then considered appropriate?

- In first case: implication that agents in the past acted on knowledge (the new, supposedly improved, model that is now proposed) that the economist did not possess at the time.

- Second case corresponds to notion that agents form expectations compatible with (incumbent) theory, as dated construct. Quite different from current practice. Assumption of dated-model-consistency would make agents act under influence of professional arguments of the past. Fallibility of theories transmitted to potential decision errors.

Some topics for exploration

- Likelihood of large expectational biases in certain conditions; asks for specific analysis of learning, expectations, aiming for practical, usable propositions.
- Parameters determining depth, intensity of propagation of financial disturbances; properties of credit networks.
- Features of events *("types of crisis")* calling for different policy treatments.
- Specific mapping of tradeoffs to help rationalize policy choices.

Thank you!