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OA/ID Number: 21608
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Folder Title:
[Global Climate Change & Argentina] [loose] [1]

Stack:	Row:	Section:	Shelf:	Position:
S	21	5	1	1

Oct 98 Argentina trip

3 points

1) yr taken as BAU

1989, 1990 bad years

2) how to reduce CO_2 growth trend, use of flex mechs

3) 2 short-term issues

- inventory of GtHb CO_2

- model to reduce trend in future

Arg has created ofc for JI - currently analyzing 2 projects

Private sector participation necessary

CDM vs Trading

→ Trading has comp adv, eg privatization + deregulation

BAU Study for Argentina

9:30 economic graph

BAU

macro economy

- expected econ growth
- expected energy efficiency
- structural Δ - FD investment

energy

- hydro development (more capacity?)
- nat gas
- oil + transport
- export opportunities

non-CO₂ GHG

- agriculture: CH₄, N₂O, sinks

?s gains from dereg/privatization

→ have lg gains all been obtained

now just sm gains

?s more capacity for hydro

?s @ how external effects drive BAU

- world economy

- demand for energy from abroad

Costs

- abatement

energy

trans

ag

sinks

- policies to

abate

- intl trading

Bens

- availability AQ

- sinks

wshed prot.

sector-specific models

eg energy

macro projections

thru 2005, then 10 yr growth projections

get copy of pink publication

energy projections yearly thru 2070 - report on web

oil - >50% tax

nat gas - small tax

no subsidies (except for remote areas)

93% of pop served by elect network

Elect: total 65

hydro 28

(N) ~ 8

by 2010 - up to 60% hydro

Forecasting

- central bank

Ind: CEP info center - data

FIEL - group does projections

1997 - 2010 - CO₂ ↑ 95%

WB project on local AQ + transport in B.A.

Weaver paper as well

or 8 ~ j

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United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

20 October 1998

TELEFAX TRANSMISSION

TO: Clare Breidenich 260-6405
 NAME: Peter Nagelhart 260-6405 TEL: _____
 Joe Aldy 395-6870 FAX: _____
 Phil Tseng 586-5391

NUMBER OF PAGES, INCLUDING THIS PAGE: 5

FROM:

NAME: Barbara DeRosa-Joynt TEL: (202) 647-4069/4511 direct

OFFICE OF GLOBAL CHANGE FAX: (202) 647-0191

OES/EGC - RM. 4330

MESSAGE:

Attached is a draft reporting cable for our recent trip to BA. I thought it would be valuable to have the team clear it, if they so choose. This will be sent out by Phil Covington so it comes from BA. I have already cleared the text through DOS, and would appreciate your comments/clearance by COB today. Thanks in advance! Any questions, please call.

Barbara

Reftel: Buenos Aires 5307

Summary

1. **Summary:** In recent weeks, as noted in reftel and in telcons, Secretary of Natural Resources Maria Julia Alsogaray has indicated on several occasions that Argentina is considering taking steps that would demonstrate Argentine leadership among developing countries. Although initial indications were that Argentina was looking to announce a target when President Menem speaks during the ministerial session at COP-4, that position has since softened. It now appears that Menem will make a strong statement, which might include an announcement that Argentina plans to take on a target. Perhaps to this end, Secretary Alsogaray requested that the USG send a team of experts to Argentina to discuss issues related to emissions baselines and projections. In response to this request, OES/EGC Director Dan Reifsnyder lengthened his stay in Buenos Aires after the conclusion of the UNFCCC Extended Bureau meeting to lead a technical team from Washington through discussions with Argentine counterparts. Productive and informative meetings were held with technical experts from a number of Argentine ministries, and the group gained invaluable insight into the progress already made by Argentina. It appears that there is political will to make a strong statement regarding Argentina's intention to take on a voluntary quantitative commitment; however, it seems clear from the meetings with the technical staff that Argentina is not analytically prepared to do so. Nevertheless, there are good opportunities for the U.S. to work closely with Argentina at the technical level to ensure that the Argentines continue to lay solid groundwork for taking on a binding target in the near future. End Summary.

Raison d'être

2. The team's purpose in traveling was twofold. First, the team went to Argentina in an effort to be responsive to Alsogaray's request for technical assistance. Second, the team's goal was to discuss the technical elements of the identification of emissions baselines and the facets of economic modeling integral to the contemplation of a binding commitment. At no time during the meetings was there a suggestion – by the U.S. or the Argentines – of a specific target, nor did the U.S. team leave any papers behind. The U.S. team made extensive, detailed inquiries regarding the current availability of data in the sectors important for economic modeling purposes. The Argentine delegation provided the data they had available among during the meeting, and identified Internet web sites where additional data may be posted.

3. The interagency technical team consisted of members from DOS: EB: Victoria Greenfield, and OES/EGC: Barbara De Rosa-Joynt; EPA/Office of Policy: Clare Breidenich and Peter Nagelhout; DOE/Office of Policy and International Affairs: Phil Tseng; and CEA: Joe Aldy.

Sessions provide clarity

4. On 13 and 14 October, the technical team met with Sub Secretary Raul Castellini, Secretary Alsogaray's deputy, and an interagency team of representatives from the Ministries of Industry, Transport, Energy, Natural Resources, and the Environment.
5. During the course of the discussions, it became clear that Argentina is not in a technical position to identify a specific target at this time. Nevertheless, there is political will to make advances and to demonstrate leadership at COP-4. However, the Argentines indicated that since President Menem has only about one year remaining in his term, they are working to ensure a wide consensus among government agencies so that efforts will continue when the government changes next year. Sub Secretary Castellini noted that never before has there been so much interagency participation in an issue as they have experienced with climate change.

Data promising but incomplete

6. Despite apparent gaps in the data, the Argentines have made significant progress in developing emissions profiles and/or projections for particular sectors, such as energy and transportation. However, it is the U.S. team's view that they must move forward analytically to address the potential costs and benefits of emissions abatement, including the preparation of an integrated economy-wide assessment. Ultimately, they will need this assessment to formulate a credible target. Whether or not they have the analytical capacity, i.e. appropriate economic models, to prepare the assessment is an open question. (It is likely that Argentina's economic agencies – or their functional equivalent – already have some such capacity, but they have not yet engaged in the interagency analytical process. The U.S. team stressed the importance of this information in any future discussions.) The Argentines inquired about U.S. methodologies, i.e. the kinds of economic models used in the United States, and the U.S. team offered to share information to facilitate selection of appropriate methodologies for Argentina. It appears that some, but perhaps not all, of the data needed to run the economic models are available.
7. Although technical coordination on an interagency level has not been widespread in Argentina, some data are shared among agencies; nonetheless, an overall integration of data and expertise has yet to be achieved. In particular, the economic agencies were noticeably absent from the meeting. However, it appears that the new Office of Joint Implementation, under Sub Secretary Castellini, will include personnel from government agencies, NGOs, the academic community, and the private sector. This approach to climate change policy is anticipated to enhance data collection and application, since some data have already been collected and perhaps evaluated by persons outside the government, but have not been incorporated into the government efforts. Those outside the government may have access to additional economic modeling tools. But, even within the government there may be significant opportunities for enhanced analytical efforts, in particular, as noted above, by engaging the economic agencies.

The road to a target is long and winding

8. The U.S. team reviewed elements that the Administration has found important when contemplating baselines and generating projections, and all agreed that Argentina's recent

economic history would complicate the modeling process. The U.S. experts discussed the elements of the U.S. analysis and data collection that made it possible to consider and commit to a binding target. The Argentines expressed interest in U.S. modeling techniques, and raised a number of questions about how the models were used and what data were incorporated. The Argentines indicated that in considering a future target, they plan to use an historical baseline. However, they emphasized that 1989-1990 was a difficult period for their country, so indications were that they do not use that timeframe for a baseline.

9. The group was in agreement that the most reasonable course for developing countries is to consider taking on targets which allow for growth, but which result in decreases from the business as usual level. The term "actions to abate the increase" was used in lieu of the term "reductions." The participants from the Ministry of Energy were quick to point out the fact that Argentina uses mainly hydroelectric power and natural gas, thereby generating low emissions levels of CO₂, NO_x, and SO₂. Argentina has very few relevant subsidies, already taxes gasoline substantially, and Argentina does not use much "dirty fuel." [Note: Argentina's tax on gasoline accounts for more than 50% of the purchase price.] This indicates that Argentina lacks some of the easier options to lower greenhouse gas emissions available to some less developed countries like China and perhaps even to some equally developed countries. Argentina is also a substantial exporter of electricity to its neighbors, including Brazil. Regardless, Argentina believes that the developing world is ready to agree that, even if countries are not yet ready to take on a formal target, they still need to work toward reducing their rate of greenhouse gas emissions growth.

10. The group discussed the benefits of taking on a binding target, and the U.S. team stressed the benefits to be gained from emissions trading, and the likelihood that countries would find that trading would be more beneficial than CDM, as a result of the transaction costs incumbent in CDM transactions and the inherent limitations of project-by-project abatement.

Future contacts

11. The group was interested in communicating again at the technical level prior to COP-4, once the U.S. team has had an opportunity to review the data received from the Argentines. Tentative plans were made to reconvene via videoconference within the next few weeks.

Comment

12. Comment: While it appears that there is political will to make a strong statement regarding Argentina's intention to take on a voluntary quantitative commitment, it seems clear from the meetings with the technical staff that Argentina is not analytically prepared to do so. The Argentines the U.S. team met with have a sound understanding that taking on a target is serious and that selecting a target that is too stringent could unduly burden their economy. Argentina's biggest problem is that there are not many areas for easy reductions. Argentina's industry is not a major source of greenhouse gas emissions, and its overall emissions levels are low, due to the use of hydroelectric power and natural gas. Those areas with room for improvement exist largely in the transportation sector, which already imposes a significant tax on gasoline. Because

of its energy profile, Argentina may face a relatively steep cost curve. Moreover, it is also a significant exporter of electricity to other non-Annex I countries, e.g., Brazil.

13. A strong statement from Menem at COP-4 about Argentina's serious efforts to prepare itself for a binding emissions target would send a clear message to other developing countries about the need to move forward. Incorporating the point made by Alsogaray at the UNFCCC Extended Bureau meeting – that if developing countries want to see developed countries take action, they need to participate themselves – would also be helpful. She noted that only by so doing can they end the circular argument that developed countries will not act until developing countries take action, and that developing countries will not act until developed countries take action.

14. The Argentines will need to continue to work to ensure that they maintain a consensus within the different factions of their government so that when Menem departs next fall, the momentum they have created will continue into the next administration. It is unclear if Argentina will be ready to announce a binding target before the close of Menem's term in office. Nevertheless, there are good opportunities for the U.S. to work closely with Argentina at the technical level to ensure that the Argentines continue to lay solid groundwork for taking on a binding target in the near future. End comment.

15. This cable was cleared with the U.S. technical team.

2/2/99

draft work plan - suggestions welcome

SNRE
 Energy (M)
 Energy
 Sci + Tech
 See Sci + Tech
 IPCC

Barros SNRE City Waste
 Industry (Patricia)
 Translet Castellini Comito
 Andrea

SNR
 empl planning
 SNR-GCC
 SNR-urban employ
 SNRSD
 SNR-haz waste
 SNRSD
 forests
 Ag forest dev
 Ag wild life + fisheries
mis Economy
 SNR-O₃
 Industry
 SNR-pollution mgmt
 Foreign Affairs
 For Affairs
 For Affairs

new proposed decree (Memon decree) - create a natl
 commission in charge of elaborating GHG emissions
 objectives, commission would include participation by
 all parts of govt, private sector and would
 propose the GHG target in the context of its
 sus dev policy; target would be a slowing the
 growth

Patricia Vasquez - early action credit - Pew report
 SO₂ trading program

need workplan text
 access to internet - Pew early action
 SO₂
 EIA arg data (emis, GDP, pop)

2/2/99

goal is to finalize workplan by end of visit

Secretariat of Sci+Tech - Menem initiated its work in 91 to study
GCC research issues; this commission includes Min Econ, MFA,
SNRSD, ag, space, sci+tech, antarctic, meteorologic service
work focuses on 1) scientific research; 2) technological work (OSTP-like)
equal participation by public + private sector

Energy - w/in min econ + pub works

deals w/ elect, oil, hydrocarbons

projecting elect + hydrocarbon demand - these future scenarios
will include GCC assessments

part of office of Joint Implementation

OJI - exec committee will advise SNRSD on efforts to address GCC,
Kyoto, + flex mechs

advisory board - provides tech assistance to excec comm

research in Argentina - Dept of Atmospheric Science - Univ of BA

Center for the Investigation of Sea + Atmospheric Dynamics

center studies on impact of GCC on ag
water + env.

IPCC participation (WG-II co-chair)

Barras Presentation: Working Plan for the Adoption of a GHG Target
announce target @ COP5

background: 1st natl comm, some studies (MFA can provide syntheses)

inventory of GHGs - energy

ag (including rice)

livestock

land use change

waste mgmt

3 vulnerability studies - sea level rise, Andes, agriculture



2/2/99

mitigation study (director of project will be here on Wed)

Goal: to produce technical info to facilitate adopting a target for 2008

main objectives: determine present GHGs baseline

- 97

- review 90, 94 inventories (not complete)

assess projections for 2008-2012

- BAU

- different mitigation scenarios

elaborate options for the Arg. proposal on GHG emission goals

prepare 2nd natl comm or review 1st natl comm.

approach: contracts w/ experts + institutes

SNRSD + other govt agencies will undertake planning

id + select experts + institutes

terms of reference

review experts' reports

coordination

need tech info at least 2 months before making the decision

Inventory: baseline year → prefer 1997 (only in 97 has Arg reached its "historic" level - per capita?)

need to improve 90, 94 inventories

legal commitment

emissions primarily from energy

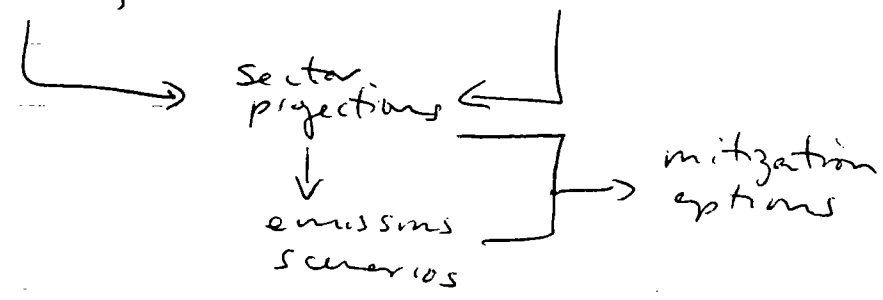
livestock (less growth - stable last 20 yrs)

Econ, Tech + Emis Scenarios

macro econ scenarios (3 scenarios)

tech trends

- admit flaws in this area, want US assistance



2/2/99

Argentina is a net sink

Sector analysis: energy, transport

ag + husbandry

forests

waste

— 1% of em.

cement? Aluminium?

Mitigation options: costs

benefits

social, envl, econ impacts

Integrated analysis: elaboration of alternative goals of GHG emissions

Technical assistance needed: technological progress (transport, hydrogen, wind)
mathematical modeling
some sectors - soils

MFA study on flex mechs

(joint w/ Canada) - available in August; already 1 wshop before COP4

private sector participation

2 objectives: 1) determine Arg position on flex mechs

2) id participation in intl emis trading

2) deciding what institutions are necessary to understd GCC

- a database to inform policy makers + experts who make decisions

report on wshop + COP4 has been produced

another wshop to finalize work expected by April

lessons - flex - when what what
 critical
 inform policy discussion
 - trading
 - energy
 - labor
 - utilities

economic projections (female)

university research
 university
 econ projects
 econ researcher
 intl trade
 MFA

energy economist
 - Daniel Bozelle Barboche

- Long-term
- inventory & projections } 2nd intl. communication
 - review of existing policies
 - modeling
- intra-agency policy process
- potential policies
 - trading, tax
 - technology
 - intl trading
 - JI → CDM
 - competitiveness
 - labor
- outreach
- consultations
 - OH out on CC
- technical work fed into position, policies
- targets
 - trading
 - CDM
 - elect res.

2/3/99

Studies Related w/ GHG Mitigation

- "Report on Mitigation Options" → results in natl comm
- "Economics of GHG Limitations"
- "Implications of Power Sector Restructuring on CC Mitigation"
- "Study on Flex Mechanisms within the context of UNFCCC + Kyoto Protocol"

Report on Mitigation Options

obj: to assess potential of mitigation options in the energy system
 sectors scope: power supply, industry, + transport
 contents: diagnosis - socioeconomic scenarios, energy scenarios, supply + demand perspective
 results: possible evolution of energy consumption thru 2020
 possible actions to mitigate GHG emissions
 principal barriers

Economics of GHG Limitations (2 Asia, 2 EITs, 2 LAm, 2 Afr)

obj: to assess methodological approach to analyze mitigation options in LDC
 scope: to develop study cases in LDC energy systems
 contents: diagnosis - Soc. economic scenarios, baseline + mitigation scenarios, mitigation options + direct incremental costs

Implications of Power Sector Restructuring

obj: investigate prospects for implementing GHG mitigation options in restructured systems

2/3/99

scope: to assess institutional (not economic) viability of "small power supply projects" (hydro, wind, solar)

contents: institutional + regulatory framework, incentives to renewable + energy efficiency, intl experience in promotion of renewable + energy eff. applicability of incentive mechanisms

results: id most imp't barriers, impacts of renew + energy eff, potential for policies + measures

Study on Flex Mechs

obj: explore options in participating - analyze adv + disadv of mchts

scope: energy system opportunities to generate GHG offsets

contents: GHG offsets potential, mcht opportunities, institutional framework, Arg system

results: id of most interesting areas, estimation of intl demand for GHG offsets, mcht options + opportunities, assessment of mechanisms

Why new studies are necessary

- new position: possible targets
- new gases baskets - new methodologies
- energy studies - need more in-depth analysis, need to calculate costs + benefits of each option; it is necessary to include local + regional envl + macroecon impacts
- need awareness + consensus to transform hypo scenarios in viable + possible ones
- need to id + design strategies for controlling GHG emissions
- definition of the institutional, legal, + regulatory framework necessary to develop action

Barro

targets will cover all sectors, GHG emissions from all sources + activities

CH4 imp't in Arg case; Arg energy sector is very dynamic - focus of work to date

Overview of Economic Projection work (SEMA?)

- o intl + Arg econ projections - primarily short-term; fiscal policies, development, intl trade
- use simple econometric models for projections - could results w/ models to date
- what type of projection - by sectors, by areas - what info is useful

2/3/99

energy sector inventory
industry sector "

Basile - energy sector projection

overview of energy sector - deregulation, privatization

sources of emissions: 1) transportation

2) electricity (50% hydro, 40% natural gas, 10% coal)

GDP growth rate	2005: 4.1%	GDP per capita	2005: 10100
95-2020: 4.4%	2010: 5.0%		2010: 12060
	2020: 4.4%		2020: 16400

Mitigation study

BAU assumptions - energy prices in line w/ intl prices

- decreasing energy intensity (dynamic tech efficiency)

- abundant energy supply (oil, gas, power)

- power generation using nat gas w/ up to date generation tech

- power + nat gas regional markets development

1% ↑ GDP → 0.8% ↑ CO₂ emis

95-2020 - CO₂ emis ↑ 138%

World Bank study

electricity sector overcapacity of 50%

efficiency mkt barriers

FIER - several macro models, sectoral models (industry / const / 9 subsectors / Corp goods / monetary / fiscal / price)
1 long-term model (based on 70s-90s)
- macro + sectoral are simultaneous
world GDP exogenous

★ need to discuss uniform input assumptions
natl income accts are critical

some sectors are very simple (2-3 eqns)

have an energy sector model - with some disaggregated
- can evaluate taxes

elect
gas
fuels

Cement model

electricity elasticity (to GDP) > 1 (up to 1.5); elect $\uparrow > 7\%$ in 90s
while GDP $\uparrow 5\%$ in 90s (cement also > 1)

2nd approach - special analysis of specific policies - need to Δ models

need more data from Min of Economy (NIPA)

model run quarterly - 3 scenarios (baseline, low, high) - 3yr analysis - quarterly

10 yr analysis (done before for oil, const, capital good companies)

- annual models

taxes in (china?) model - very detailed in electricity

FLACSO - MERCOSUR + macroeconomic modeling

5yr time horizon (have done 10yr ~~to~~ run)

don't work w/ sectoral models

have done modeling w/ IADB

annual model

can disaggregate by region

SEMA - forecast macro indicators 2-3 yrs

forecast sectors (9 natl acct sectors)

what outputs are necessary

how to handle various scenarios (Mercosur evolution, hi, lo..)

sectors: ag, service, industry, energy, transport

FIEC - ^{input assumptions} world GDP, oil prices, world interest rate, US GDP,
exchange rates (euro, yen, dollar), regional growth
has association w/ DRI - get data from DRI

CGE used on end emissions in WADI

Bonilla - need a workshop asap internally

how to devote resources to 2nd process (mitigation)

Argentinean I-O table ready in 2000 - being developed
by econ minister,

Offer to review BAU forecasts

SUGGESTED DRAFT AGENDA
First Technical Meeting EPA- SRNYDS

Objectives

- Review the SRNYDS Project to produce the information for political decision making in the definition of GEI Emissions Target for 2008-2012.
- Review of the American experience in analyzing GEI Emissions Targets.
- Identify technical and financial needs.
- Identify appropriated scope of the EPA assistance to SRNYDS Project.

First day, morning

Participants:

- American embassy representatives
- SNRNDs officials
- EPA visitors
- SRNYDS technical group on Climate Change

1. **Welcome and introduction (1/2 hour)**
 - Opening remarks and introduction of the participants.
 - Objectives of the meeting

2. Introduction

- Argentine and Climate Change (1 1/2 hour)
 Government organization
 Activities and capabilities at the government agencies, universities and private sectors
 The proposed SRNYDS Project to produce the information for political decision making in the definition of GEI Emissions Target for 2008-2012.
- American and EPA experience (1 hour)
- Discussions (1/2 hour)

First day, afternoon

Participants:

- EPA visitors
- SRNYDS technical group on Climate Change
- Argentine lead authors of previous related projects

2. Introduction (continue)

- Project ARG/95/G31 Studies on Climate Change in Argentina: Inventory, Vulnerability and Mitigation (1/2 hour)
- Inventory (1/2 hour)
- Mitigation (1 hour)
- Argentine study on mechanisms of flexibility (1 hour)
- Discussions (1 hour)

Second day, morning

Participants

- EPA visitors
- SRNYDS technical group on Climate Change
- Argentine experts.
- Representatives of the Secretary of Energy
- Representatives of the Secretary of Transport

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

of pages ▶ 4

To	Joe Aldrey
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From	Barbara Defosa - Dept
Phone	647.4511
Fax #	395.6870
Per my voice mail message	
GENERAL SERVICES ADMINISTRATION	
NSN 7540-01-317-7360 5099-101	

3. GEI Emissions projections and Mitigation ideas in the Energy sector and in the Transport sectors

- Overview of the official projections on the energy sector (½ hour)
- Same for the transport sector (½ hour)
- Discussion on technological trends (EPA is expected to contribute mainly in the transport sector) (1 hour)
- Discussion and identification of technical assistance (1 hour)

Second day, afternoon

Participants

EPA visitors

SRNYDS technical group on Climate Change

Argentine experts.

Representatives of the Secretary of Agriculture and Forestry

4. Projections and Mitigation ideas in the Agriculture sector and in Forestry and Change in the use of Soil

- Overview of the projections in Agriculture, Livestock and Agrochemical use(1/2 hour)
- Same for the forestry activities and of the native forest (1 hour)
- Discussion on Forestry and change in the use of soil, ideas on what is going to come up from the IPCC technical document, what approach to take in projections related to targets (EPA is expected to contribute) (1 hour)
- Discussion on technological trends (EPA is expected to contribute in Agriculture and Livestock) (1 hour)
- Discussion and identification of technical assistance (1 hour)

Third day, morning

Participants

EPA visitors

SRNYDS technical group on Climate Change

Argentine experts.

Representatives of the Secretary of Industry

Representatives of CEAMSE (Waste disposal in the Great Buenos Aires)

5. GEI Emissions projections and Mitigation ideas in the Industry and Waste sectors

- Overview of projections in waste and waste disposal (1 hour)
- General discussion on the non energy future emissions of the Industry (½ hour)
- Same for the cement industry (1/2 hour)
- Discussion on technological trends (EPA is expected to contribute) (1 hour)
- Discussion and identification of technical assistance (1 hour)

Third day, afternoon

Participants

EPA visitors

SRNYDS technical group on Climate Change

Argentine experts.

6. The use of modeling in mitigation assessment

- EPA presentation (1 ½ hour)
- Discussion and identification of technical assistance (1 hour)

7. Final conclusions (3 hours)

- Argentine workplan to October 1999 (Argentine commitment at the COP V)
- EPA Contribution to the Argentine workplan
- Future work

Phil's home
790-4397

Non night
dep Thurs night

Draft Agenda for US-Argentine Technical Team Meeting, February 1999

I. Welcoming Remarks

II. Introduction

A. Division of climate responsibilities among ministries, universities, contractors, etc.

- 1. GOA
- 2. USG

B. Review of objectives

- 1. Goals of GOA – next year and beyond
 - a. SRYNDS-USG project proposal
 - b. Other GOA projects, studies, etc.
 - c. Brief overview of technical/financial assistance sought
- 2. Goals of USG DAR
 - a. Work with GOA through the SRYNDS-USG project and others
 - b. Identify technical/financial assistance available

2pm Tues
→ 5 or 6
Wed, Thurs R11 days
inventory - 2nd with com
modeling
tech tradig - don't
competitiveness
II → CDM
evaluate existing policies
potential policies
consultations
with conference
→ CCTI
dem cap + trade
elect res.
early action

III. Developing a target

A. GOA

- 1. Review of groundwork laid to date
- 2. Plans/proposals for how GOA will come to a decision on a target [by COP-5]
- 3. Work remaining to be done before GOA is ready
- 4. Technical assistance sought

B. USG

- 1. Review of groundwork laid in preparation for taking on a target (what we had to put in place so that we knew what target we could accommodate) Victoria
- 2. Lessons learned with different modeling types in assessment of target Joe/Victoria
- 3. Lessons learned through development of our inventory Wiley / ICF Kaiser
- 4. Lessons learned from our early mitigation efforts EPA - Wiley or Bill H?
- 5. Technical assistance we can offer Maurice

IV. Sector Specific Discussions

A. Energy and Transport

1. GOA

- a. Groundwork laid in inventory
- b. Projections for sector
- c. Technical assistance sought

2. USG

- a. Lessons learned with models in this sector
- b. Lessons learned regarding trends and ability to impact trajectories of emissions levels in this sector DOT-Kevin Green, DOE-Ray?
- c. Lessons learned regarding mitigation technologies DOT-Green, DOE-Ray?
- d. Technical assistance we can offer – DOE-Ray?

+ flexibility mechanisms

+ strategies + policies

Mariott Plaza
Florida 1005
541-318-3000
3008 fax

B. Agriculture, Forests and Soils**1. GOA**

- a. Groundwork laid in inventory
- b. Projections for sector
- c. Technical assistance sought

2. USG

- a. Lessons learned with models in this sector
 - b. Lessons learned regarding trends and ability to impact trajectories of emissions levels in this sector **Bill²/Margot?**
 - c. Lessons learned regarding mitigation technologies **Bill²/Margot?**
 - d. Technical assistance we can offer – **Bill²/Margot?**
- 3. Brief discussion of status of IPCC technical work in this sector Bill²/Margot?**

C. Industry and Waste**1. GOA**

- a. Groundwork laid in inventory
- b. Projections for sector
- c. Technical assistance sought

2. USG

- a. Lessons learned with models in this sector
- b. Lessons learned regarding trends and ability to impact trajectories of emissions levels in this sector **EPA/OAR or Solid Waste rep**
- c. Lessons learned regarding mitigation technologies **EPA/OAR or Solid Waste rep**
- d. Technical assistance we can offer – **EPA/OAR or Solid Waste rep**

V. Conclusions

A. Argentine workplan up to COP-5

B. Review of technical assistance available from the USG

Agency reps, as appropriate

C. Future work

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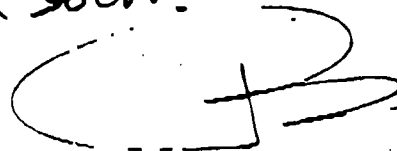
Date:

N° of pages including cover:

To: ~~DES/EGC~~: Don Re:fyder & Barbara De Rosa-Loyat 737-0191
Attention: EPA: Maurice Lefranc 73931-202-260-6405
Fax Number: and Don Belillo
From: CEA: Joe Aldy 73931-202-~~405~~ 395-6870

Philip Covington

As promised. We look forward to seeing
some of you soon!



PS Our translation of the SRNIP's strategy
is pretty rough, so we ^{send} included the Castellano
version, seperately.

MEMO

TO: Mr. Phil. Covington
American Embassy

FROM: Dr. Vicente Barros
Secretaria de Recursos Naturales y Desarrollo Sustentable

ISSUE: Notes on : "Setting an Emissions Growth Target. Technical Issues"

DATE: January, 6, 1999

We agree with most of what is said in this document. Specifically, we agree with the suggested approach to develop basic information for the Argentine' decision making process of setting emissions targets on GEI.

We share the view that there is some existing analysis done on Mitigation. However, this analysis is limited to the energy and transport sectors. Furthermore, it does not include abatement costs and the benefits of abatement.

In the text, there are some question marks that I do not know if they are there looking for an answer or are simply a colloquial way of expression. In any case I will answer all of them.

Page 2, line 6 from the bottom. Yes, we are considering to have at least three macroeconomical scenarios, if possible from three prestigious consultants with different political or technical ascription. These scenarios may approximately converge or diverge between them. In the first case, beyond the ideological background of the consultants, we will have a good consensus. In the second case we will have a possible range for the values of the macroeconomics scenario.

Page 2, line 5 from the bottom. Of course, there is such consistency. The recent past Argentine experience do not apply as a rule for the future. In the energy sector there was a tremendous modernization that change the very inefficient thermal generation sector of the 80's to one of the most efficient of the world now. At the same time there was an increase of the hydraulic share in the mix of the energy offer.

Page 2, last line. According to the answer to the former question, it is obvious that the trend in carbon dioxide emissions relative to economic growth will not be expected to be the same as in the recent past. In any case, there are other key sectors where it is possible to make considerable efforts with the concept in mind of emission growth targets as explained in the first paragraph of the document.

Page 3, second line. In the Argentine case, this is true to certain extent. Investments, associated with modern technology, may result in some cases in lower rates of GEI emission growth.

Page 3, line 6. In developing the targets for 2008-2012, as a first approach, we do not consider necessary to analyze the non energy industrial emissions. In the 1994 inventory this sector was responsible of less than 4 % of the carbon dioxide emissions and about 3 % of the methane ones, which are by far the more relevant gasses of the Argentine emissions in terms of GPW. Perhaps, it will be necessary to analyze the cement industry which accounts for the 80% of this 4 %. Countries which have now a similar economical profile to that Argentina will have in the 2010 show no very larger shares of the non energy industrial sector. It will be welcome any suggestion on the developing of new technologies that may result in new sources of emissions.

Page 4. Second paragraph. For the time being, we did not identify modeling capacity within the key sectors of the Argentine Government. We expect to have an answer to this point soon

**A STRATEGY PROPOSAL BY THE SECRETARIAT OF
NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT
POST COP4**

After COP4, the strategy of the Secretariat of Natural Resources and Sustainable Development (SRNDS) should be centered in two large columns: definition of the objectives for COP5 and the fluid operation of the Office of Joint Implementation to administer the Kyoto Protocol mechanisms.

1. Working Plan for the definition of objectives

1. Introduction

In his speech at COP4, the President announced that Argentina will establish its objectives for greenhouse gas emissions (GHG) for the period 2008-2012 in the future COP5.

Therefore, it is appropriate to review some aspects on the way in which the national GHG objectives were established in the Kyoto Protocol. It is also necessary to describe briefly the methodology for the establishment of national objectives. Both aspects are necessary for the formulation of a basic plan of activities, to facilitate the adoption of GHG emissions compatible with national sustainable development.

1.1 Emission Quotas in the Kyoto Protocol

The emission quota adopted in the Kyoto Protocol for the period 2008-2012 have been expressed as percentages of the emissions of the base year 1990.

For countries with transition economies, it was decided that such quotas should be expressed referring to the base year that the country had chosen or would choose in the future, if the first national communication had not taken place (article 3.5).

An emissions inventory for a base year has the advantage of automatic adjustments in the case that methodologies to estimate emissions are modified or new knowledge improves those estimates. Expectations are that emission estimates given the change of soils and forests use may be modified as a result of future recommendations of the Technical Commission of the IPCC, formed at a request of the Convention.

In addition, the reference to a base year has the advantage of allowing relative comparisons among countries and allows a simpler calculation of savings in global emissions.

In consequence, it is convenient to formulate Argentine commitments with reference to a base year, among other reasons because, if other formula were used, reductions relative to possible emissions scenario or fixed quotas of emission for the period 2008-2012, would face criticism and resistance of the international community.

1.2 Methodology for the Evaluation of Future Emission Settings (scenario).

The methodology to study possible future reductions of GEI emissions is to establish a base setting without an intervention mechanism trying to reduce emissions (which is known as "business as usual" or BAU scenery), and then to evaluate possible reductions through the effect of specific measures in mitigation settings.

The identification of all these settings is a prospective work and as such, subject to possible errors. However, since GHG emissions are closely connected to economic development, there is little probability that errors are by excess since the most probable economic changes, and less predictable, are recessive crisis.

The practical consequence is that if there is a negative economic development, it would be relatively easy to fulfill adopted emission objectives and, eventually, to remain under them.

Settings of future emissions are based on future economic settings. To that end, consistent hypotheses

of the international situation and the evolution of the national economy are established. The economic sectors more relevant for GHG emissions are treated in a more detailed way, incorporating foresighted technological innovations. Emissions are calculated following approximately the same methodology of National Inventories. The same procedure is followed in mitigation settings, including hypotheses on mitigation measures that might be tested.

There are mathematical models that allow a consistent adjustment of economic hypothesis and the calculation of GHG emissions.]

In discussions with EPA officials during COP 4, they offered the model used by the U.S. in the negotiation with Kyoto ("Battelle's Second Generation Model").

2. Second National Communication

Argentina presented its first National Communication in June 1997, after ratifying the Framework Convention on Climate Change. That was done in spite of the fact that the base study of the National Communication -- Project ARG/95/G31 was not finished until the end of 1997.

At that time, the Foreign Office gave priority to presenting the document in a timely fashion, which was appreciated by the Convention's Secretariat, the UNDP and the GEF. However, given the urgency to present it on time, the National Communication provides no information on emissions of the agricultural sector and on the change of land and forestry uses. These aspects were later completed in the final report of the Project ARG/95/G31, as well as the vulnerability studies, which are slightly mentioned in the National Communication.]

The same pressure to deliver the communication on time impeded the previous discussion with interested private sectors, businessmen and NGOs. Though industrial activities (not including energy consumption which in the inventory appears under fuels) only contribute a small percentage to GEI emissions (3%), its precise determination is important for the possible accreditation of mitigation]

flex

activities within the framework of the Kyoto Protocol in that sector.

Some sectors were concerned by the figures in the National Communication. Discrepancies may be explained by ignorance of the methodology to prepare inventories of such National Communications, according to IPCC regulations, to the utilization of different analysis years, or to possible errors on the production volume of certain industrial activities in the National Communication.

In this sense, the second National Communications of the Annex I countries have corrected the initial inventories of their first Communications with figures of generally between 1% and 3% of total emissions, and in some cases, largely exceeded those figures. In general, corrections are a result of better statistical information and detection of errors.

The presentation of a second National Communication, before or during COP 5, would facilitate a complete official document (including emissions by all sectors and gases considered in the Kyoto Protocol). If the industrial sector had errors, they could be corrected by the introduction of new estimates for years 1990 and 1994, as other countries of Annex I have done. Basically, by its previous submission to interested sectors for consultation and evaluation, any doubts about the information on which the Argentine Government will have to base important decisions would be cleared away.

There is a more important reason to have a second National Communication before announcing any commitment: since commitments should refer to a base year, year 1997 would be a positive choice since preliminary estimates show that emissions in the energy sector are 10% higher than in 1994 and 20% higher than 1990 (which are the years accounted for in the first National Communication). The election of this base year would be worthy of consideration because in 1990 Argentina suffered a deep economic recession and during the decade of the 80's emissions were approximately at the 1994 level. It is worth noting that countries with transition economies have had the liberty to choose their base year.

} Natl Comm.

} base year

Finally, the Argentine decision to establish emission objectives for the period 2008-2012, should be formalized in some way. Since the Kyoto Protocol, as it is, would not allow voluntary commitments by non Annex-I countries, and it would be difficult to change this situation in the near future, the declaration of a commitment in the National Communication would give it an official value because Argentina would thus be complying with articles 3 and 4.2 of the Convention.

3. Objectives

3.1 Main Objectives

a) To conduct the inventory of GHG emissions for 1997 and revise those of years 1990 and 1994.

Inventory

b) Projection of emissions for the year 2010, assuming the absence of reduction measures, with different hypothesis of economic evolution and a moderate technology development ("business-as-usual").

BAU

c) To establish different mitigation scenarios. To analyze their effects on emission reductions as well as costs and benefits.

mitigation

d) To elaborate alternatives for the Argentine proposal of GHG emission objectives referable to base year 1997.

target options

e) To prepare the second National Communication.

Natl comm

3.2 Secondary Objectives

a) To establish a data base with detailed information conducive to the above objectives, at the SRNDS.

b) To install at the SRNDS, the capacity to design and audit studies of GHG inventories and prospective studies of emissions and mitigation measures.

*modeling
Capacity*

c) To generate the capacity for the execution of National Communications

4. Methodology

The following are only general outlines.

December 1998.

b) Incorporation of experts and consultants.

- Identification and contacts: December 1998 and January 1999.

- Reference terms: January 1999.

- Incorporation: February 1999.

c) Execution of the central technical work

February, March and April 1999.

d) First completed report of the experts

May 1999.

e) Technical auditing of work by the experts

May 1999.

f) Drafting of the Inventory

June 1999

5.2 Prospective Analysis of the economic, technological and emissions scenarios and of mitigation scenarios

a) Integration of follow-up teams and discussion in the Secretariat.

December 1998.

b) Application for foreign assistance.

December 1998.

c) Incorporation of experts and consultants.

- Identification and contacts with national experts: December 1998 and January 1999.

- Reference terms: January 1999.

- Incorporation: February 1999.

d) Reception of technical assistance. Modelling and technological settings.

- a) Centralization of the direction of the Project at the Secretariat of Natural Resources and Sustainable Development.
- b) Contracting of national experts from private organizations, CONICET (National Council for Scientific and Technical Research) and Universities, to conduct studies in specific project areas. (The inclusion of experts from other official agencies should be analyzed).
- c) External technical assistance to elaborate scenarios for economic-technological developments and coherent emissions using mathematical models, as well as for the prospective analysis of technological development of certain key activities for GHG emissions.
- d) Technical auditing of experts' work by the SRNDS (in some subjects experts from other areas of the national Government will be requested for auditing).
- e) Technical auditing by international experts.
- f) Discussion of the Project's results with related Government areas, with businessmen, NGOs and other sectors potentially interested.
- g) Final editing of the documents and archives of the data base by the SRNDS.

5. Target Date

Direction of the Project. Definition of direction scheme, responsibilities, etc.

December 1998.

5.1 Inventory

- a) Integration of the technical teams of the Secretariat to:
 - Request and reception of external technical assistance.
 - Technical auditing.


February and March, 1999

e) Programing models with hypotheses of economic scenarios.

April and May 1999.

f) Final report of experts.

June 1999.

 d) Analysis and development of targets.

June 1999.

5.3 National Communication

a) Incorporation of consultants

- Identification and contacts with experts: March 1999.

- Reference terms: March 1999.

- Incorporation: April 1999.

b) Drafting of the National Communication: April and May, 1999.

c) Provisional publication: July 1999.

5.4 Discussion of the National Communication

Including inventory and Argentine proposal for GEI emission objectives: July, August, September 1999.

5.5 Final Edition of the National Communication:
October 1999.

6. Resources

The final working of the plan of activities depends on the resources that are assigned.

According to discussions with EPA officials, there is a possibility of their technical and financing support.

Financing support from GEF does not seem possible because discussions and approval of projects are extremely slow, as happens also in the beginning phase of implementation with UNEP. Even presenting the project in December, it would be approved in the meeting of the executive committee in March, if there were a strong political disposition. Even then, initiation of the work would only be possible in June and there would be no time for the necessary discussion in such an important subject.

Therefore, it is convenient to start soon with all the mechanisms for the initiation of the action plan in order to define the objectives committed by the President.

7. Conclusion

Given all the above and the urgency of the related activities, the following should be defined as soon as possible:

- ◆ General Outline of a Strategy for Cop 5 (for which this proposal is presented).
- ◆ "Role" of the national environmental agency.
- ◆ Participation of the sectors involved (public and private).
- ◆ Reconsideration of activities and competence areas of the Foreign Office and the Secretariat of Natural Resources and Sustainable Development.

2. Operation of the Office of Joint Implementation

Following are the main issues that should be defined in order to strengthen the action of the Office:

1. Adoption of the proposed Operation By-Laws of the Office of Joint Implementation (OJI)*.
2. Adoption of the draft "Basic Outline for the Presentation of Projects to OJI". (Formal procedures are important in order to start automatizing the operation of the Office)*.
3. Constitution of the Advisory Committee of OJI*.
4. Definition of the Formalities (form-filling) for accreditation of project certifiers*.
5. Identification of priority sectors for the OJI*.
6. Follow-up all discussions on the definition of regulations and institutions of the mechanisms of the Kyoto Protocol as well as the Joint Implementation Activities to strengthen the institutional capacity of the office. To establish connections between the Office and other programs, such as the US initiative on Joint Implementation.

*There are final drafts, or nearly finished, for all these cases.

do CH₄ emissions from livestock vary
between confined feed lot and free range?

AGLINK - ARGENTINA

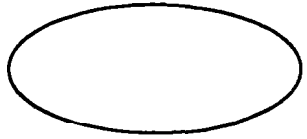
Summary of Scenarios

Variables	1	2	3	4	5
WPrice Wheat	↑↑	↓	↑	↓↓	↑↑
WPrice Maize	↑↑	↓	↑	↓↓	↑↑
WPrice Oilseeds	↑↑	↓	↑	↓↓	↑↑
WPrice Oils	↑↑	↓	↑	↓↓	↑↑
Beef Producer Price	↑↑	↑	=	=	↑↑
WPrice Butter	↑↑	↑	↓	↓↓	↑↑
WPrice Cheese	↑↑	↑	↓	↓↓	↑↑
WPrice Skim Milk	↑↑	↑	↓	↓↓	↑↑
WPrice Whole Milk	↑↑	↑	↓	↓↓	↑↑
Productivity- Fattening	↑	↑	=	=	=
Productivity- Cow-Calf	↑	↑	=	=	=
	BEST			WORST	

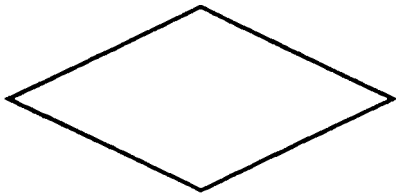
AGLINK – ARGENTINA
GRAPHICAL DESCRIPTION

Argentina model

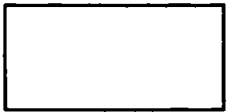
Legend



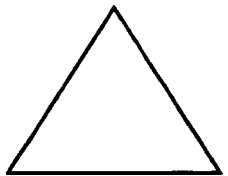
Exogenous



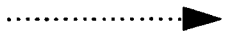
Endogenous, identity



Endogenous, behavioral



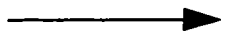
No or very small direct influence of world price on domestic markets.



Influenced by outside factors (other markets, other countries or world price).



Influencing other sectors.



Links inside the sector.

Argentina grains and oilseeds markets

wheat and coarse grains food demand system

price \ quant	wheat	maize	rice	beef	income
wheat	X	X		X	X
coarse grains	X	X	X		X
rice	X	X	X	X	X

feed demand system

price \ quant.	coarse grains	meals	soybeans	non-ruminant	ruminant
coarse grains	X	X	X	X	X
meals	X	X	X	X	X
soybeans	X	X	X	X	X

oilseeds and products

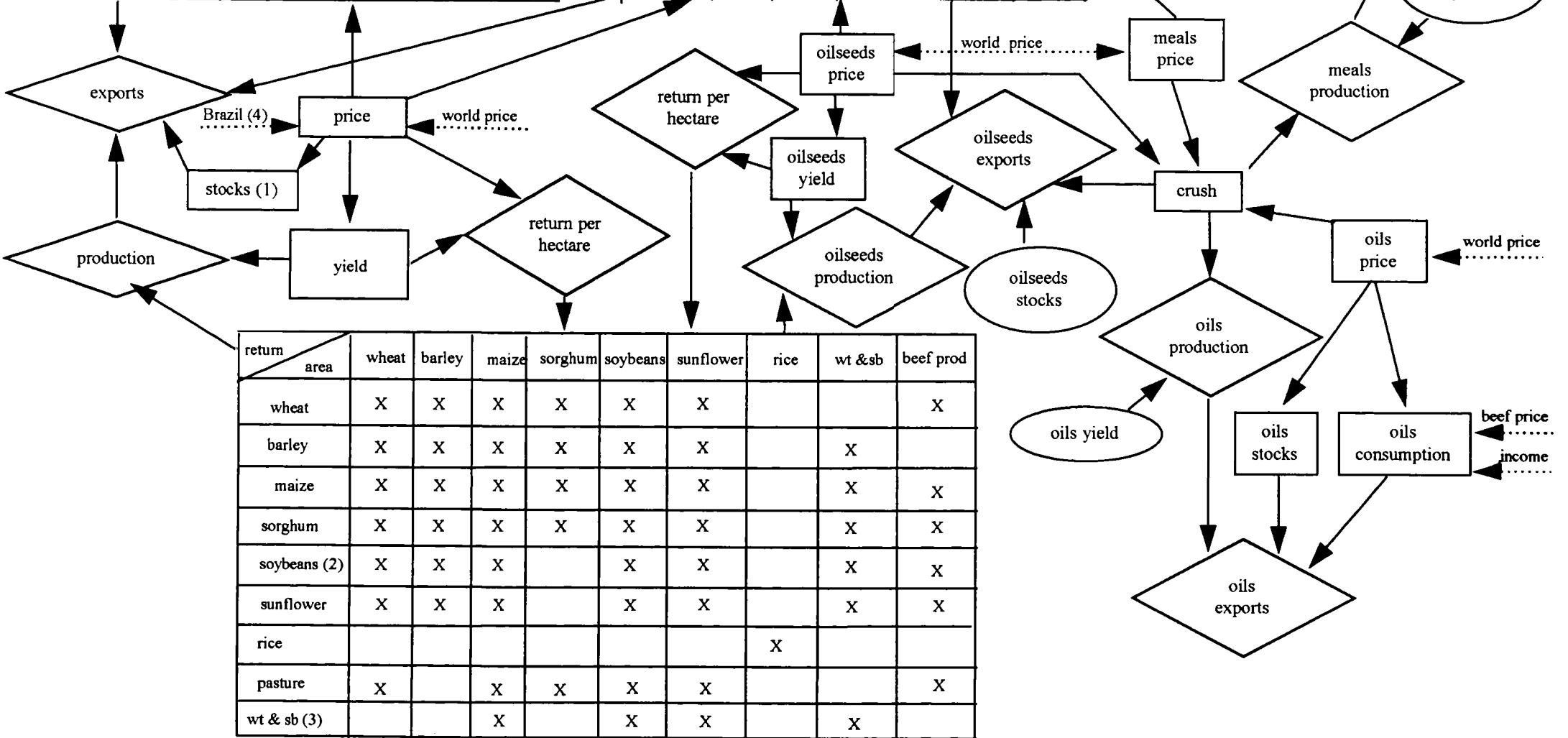
feed cost index →

world price

world price

beef price

income

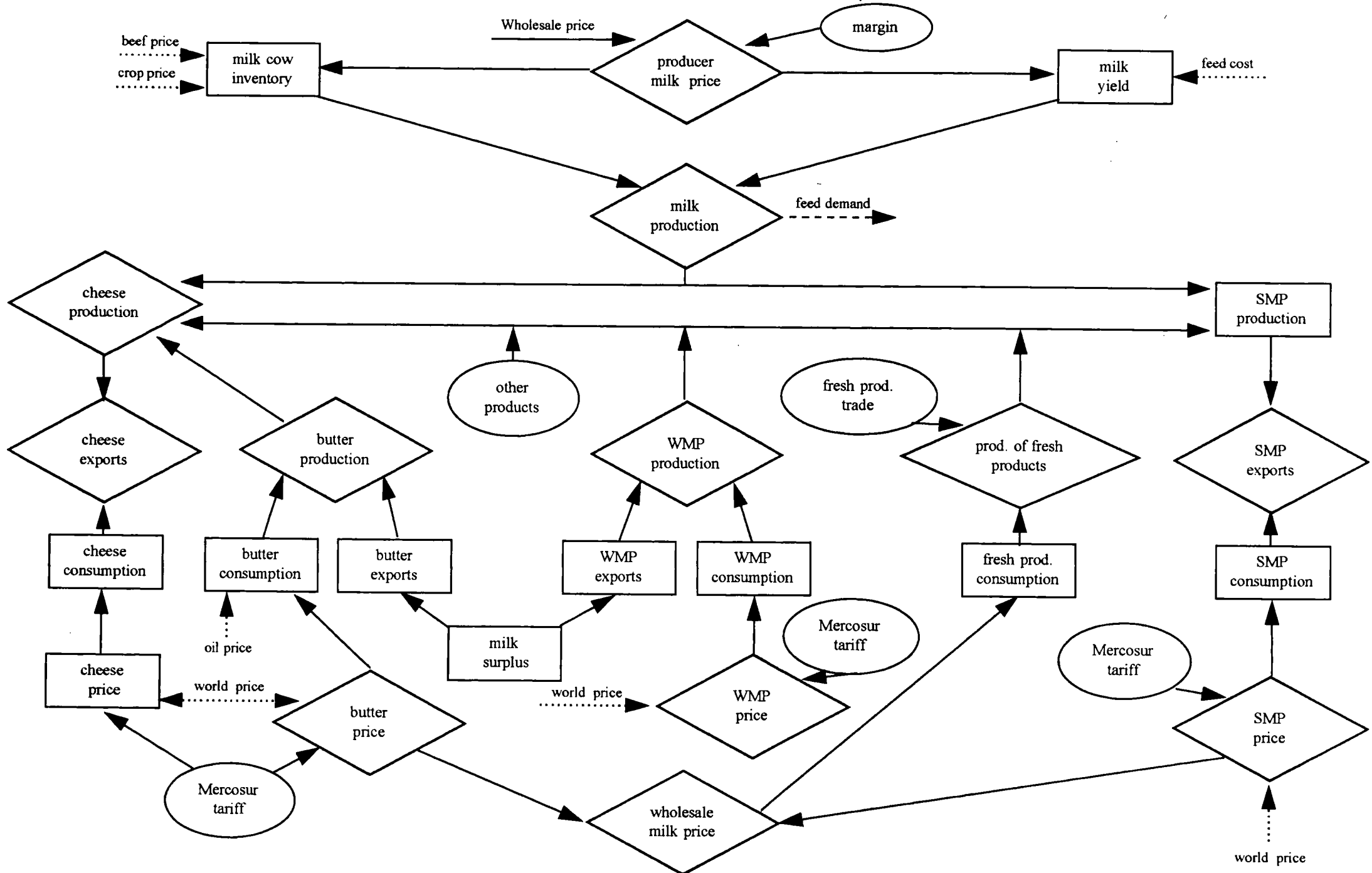


return \ area	wheat	barley	maize	sorghum	soybeans	sunflower	rice	wt & sb	beef prod
wheat	X	X	X	X	X	X			X
barley	X	X	X	X	X	X		X	
maize	X	X	X	X	X	X		X	X
sorghum	X	X	X	X	X	X		X	X
soybeans (2)	X	X	X		X	X		X	X
sunflower	X	X	X		X	X		X	X
rice							X		
pasture	X		X	X	X	X			X
wt & sb (3)			X		X	X		X	

area allocation system

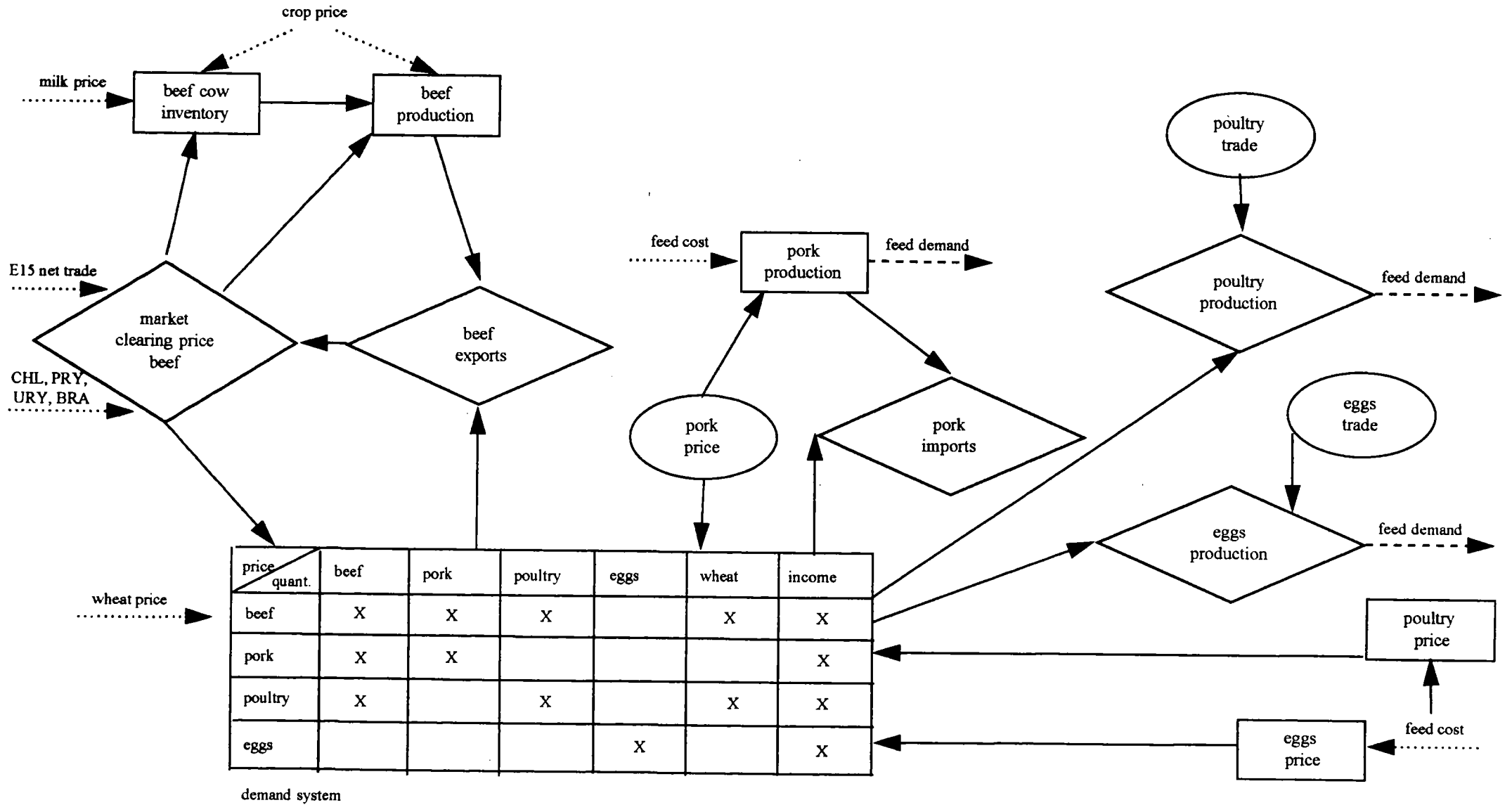
(1) exogenous for wheat and rice (2) single crop (3) soybeans as a double crop with wheat (4) Only for wheat mercosur external tariff

Argentina milk and dairy products



Milk surplus: milk production minus milk equivalent of other dairy products and fresh products production and of WMP, butter and cheese consumption

Argentina meats and eggs markets



SAT – SIGMA
DESCRIPTION

ANNEX I

EX-ANTE ANALYSIS OF AGRICULTURAL RESEARCH IMPACT: THE SURPLUS BY ADOPTION OF TECHNOLOGY (SAT) MODEL.¹⁰

1. INTRODUCTION

The permanent desire to reduce the uncertainty associated with the future, has created a demand for tools to assist decision-makers at different levels in the process of agricultural research resource allocation.

There exists a significant body of previous work related to *ex-ante* evaluation of returns to investments in agricultural research (Piñeiro, 1984; Pinstруп-Anderson, 1977; Scobie, 1979; Davis, 1984; Davis, Oram and Ryan, 1987; da Cruz, de Castro, Tollini y Sugai, 1988; Evenson, 1988). The most commonly used approach is that of the estimation of the economic (producer + consumer) surplus attainable as a consequence of supply function shifts attributable to the adoption of technological innovations.

The study to be presented in this paper applies a methodology that differs considerably from the most commonly used ones. It assumes that a single aggregate supply curve for agricultural products does not accurately describe the reality, especially in LDCs. Should this assumption be correct, the observed variability in the universe of agricultural firms should be taken into account before attempting to evaluate the consequences of alternative decisions concerning investments in generation and transfer of agricultural technology.

2. THE MODEL.

SAT is a tool that consists of a mathematical simulation model that allows for *ex-ante*

¹⁰ Based on Cap, E.; Miranda, O.: "Análisis *ex-ante*" de impactos de la investigación agrícola en la Argentina para siete rubros productivos en escenarios alternativos" (*Ex-ante* analysis of agricultural research impacts in Argentina for seven productive activities under alternative scenarios). In: *Actas del Simposio Internacional: La Investigación Agrícola en la Argentina. Impactos y Necesidades de Inversión* (Proceedings of the International Symposium: Agricultural Research in Argentina. Impacts and Investment needs). Eds.: Cirio, F.; Castronovo, A. 1994. INTA, Bs. As., Argentina.

analysis of aggregate sector impact (measured as changes in total output) of alternative strategies for agricultural research resource allocation. SAT estimates how much more would be produced, compared to current levels projected into a given time horizon, IF SPECIFIC TECHNOLOGIES ARE GENERATED AND TRANSFERRED.

The following assumptions are made:

- There exist three technological levels (TL) among farmers of homogeneous agroecological areas: low (LTL), medium (MTL) and high (HTL), respectively associated with a set of techniques, inputs and a resulting productivity indicator (average yield) (see Fig. 1).

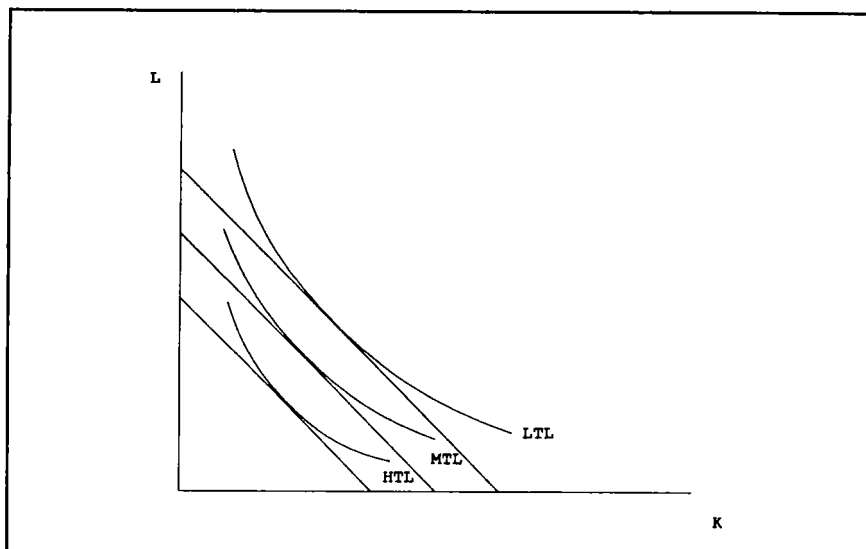


Figure 1. Stylized representation of technologies implemented by farmers, for 2 inputs (K and L).

- There exists "upward mobility" among TLs, which is made possible by the adoption of AVAILABLE techniques and inputs, together with the capacity to use them efficiently. This "inter-level mobility" (ILM) rate is defined as the percentage of the area¹¹ of a given TL that gets "promoted" each year to the next TL, in terms of productivity¹². This process is represented by a linear function. This mobility is unidirectional, that is, promoted areas cannot be "demoted".
- The National Agricultural Research System, has the capacity to generate NEW technology. Its (future) adoption by farmers is represented by a non-linear function (sigmoid), its parameters given by the nature of the innovation and the socio-economic profile of the target audience (see Fig. 2).

¹¹ Or any other unit of measurement that would be suitable as an indicator of scale of production (i.e., "bee hives" for honey production).

¹² The rate of mobility, such as it has been defined, can be conceived as an indicator of the RATE OF ACCUMULATION OF HUMAN CAPITAL in the agricultural subsector which is being considered. This is so since, to have access to inputs and information on its optimal use is a necessary but not sufficient condition to attain the productivity levels associated with the top TL. To the acquisition of the needed KNOWHOW (which is not the same thing as having access to the information), we must add an enhanced entrepreneurial ability (including the means to evaluate both downside risks and upside potential together with the willingness to take the risks). This implies a process which is unavoidably slow and accumulative, clearly linked to one of the least studied components of any economic system, which Hayami and Ruttan (1985) call "cultural endowment". This cycle of human capital accumulation adds credibility and support to the assumption of the unidirectionality of the phenomenon of inter-level mobility. Although it is acknowledged that micro (i.e., erroneous business decisions) or macroeconomic circumstances (i.e., changes in the price ratios) can lead to a drop in productivity due to the suboptimal utilization of inputs, that does not necessarily imply an involution in the process of human capital accumulation: if the environment returns to its *ex-ante* status, productivity would probably pick up after a brief lag. A parallel could be drawn between this situation and the unutilized capacity of an industry, augmented as a consequence of business cycle-related causes and its incidence on fixed costs.

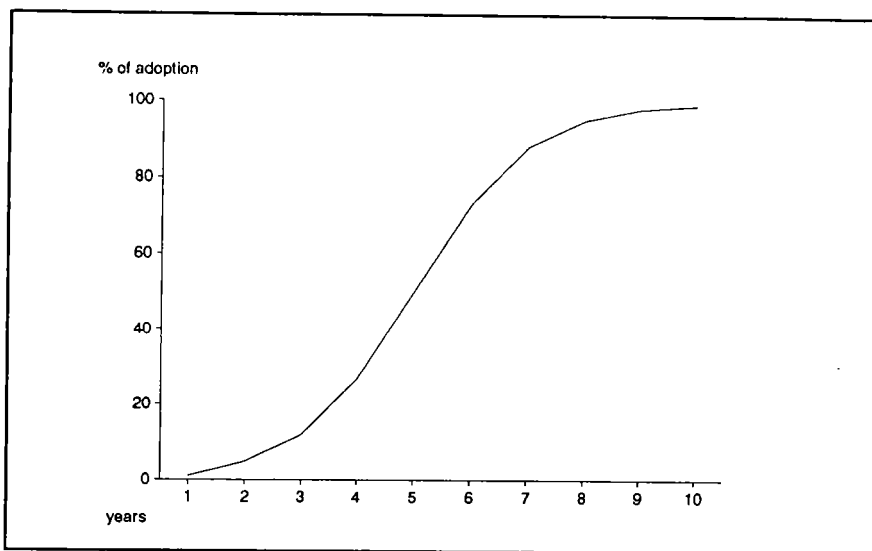


Figure 2 Cumulative adoption percentage for an adoption ceiling (K) of 0.99 and an adoption half-time (ϕ) of 4 years.

The model key component consists of a reconstruction of the process of adoption by farmers of technological innovations that shift the isoquant that represents them (as a combination of inputs and factors), achieving a more efficient use of resources, which implies a reduction of production costs. The most significant **implicit** assumption that SAT makes is that the coexistence of the three isoquants or TLs, cannot be satisfactorily explained resorting to analytical tools provided by the neoclassical economic theory, since according to it, if farmers are profit-maximizers, they would all move to the isoquant nearest to the origin (the chosen point on that isoquant would depend on price ratios). This does not imply that the rationality of farmers is being questioned. Instead, it recognizes the existence of barriers associated with incomplete and/or non-existent markets, as well as of restrictions to the adoption of available technology and its optimum utilization, caused by the undersupply of public goods (like infrastructure) or pure private ones (like refrigeration or storage capacity) or mixed ones, like entrepreneurial skills or level of training of farmers.

The SAT model is not to be thought of as an alternative to the other ones proposed in the literature, but as a contribution that improves them. It tries to identify and explain the dynamics of two processes that take place at the same time. According to previous studies

(Byerlee, D. and Hesse de Polanco, E., 1982), the adoption of a specific innovation occurs at a rate which is considerably higher than the values found for the inter-level mobility (Cap *et al*, 1993). There is another significant difference between these two processes: its mathematical representation (linear for the ILM and non-linear (sigmoid) for the adoption of a single innovation).

The SAT model treats the surplus produced in excess of the current output, as a function with the following general expression:

$$E_t = f [x_t^d [w [R (Bp)]] , x_t^p [Y^p (tec^p) , p_t ((\phi(tec^p), K, \alpha(Bp))) , S(tec^d \in D, tec^p)] ,$$

where:

- E_t : surplus attained at time t .
- x_t^d : increase in productivity (yield) at time t by tapping into the stock of technology available at time t_0 .
- w : annual rate of inter-level mobility.
- R : restrictions to ILM.
- B_p : supply of public goods (extension, infrastructure, macroeconomic policy, etc).
- x_t^p : increase in productivity (yield) at time t attributable to the adoption of new technology ($x_t^p > 0$ if $t \geq t_d$, where t_d is the time of availability of the technology; $x_t^p = 0$ if $t < t_d$).
- Y^p : potential productivity of the new technology.
- tec^p : non-available technology (to be developed).
- tec^d : available technology.
- D : stock of available technology.
- p_t : level of adoption of tec^p at time t ($p_t > 0$ if $t_d \geq t$).
- ϕ : parameter that measures the time it takes for 50% of farmers to adopt a specific new technology.
- K : adoption ceiling, $K \in (0,1]$
- α : restrictions to the adoption of a specific technology.
- S_{TL} : correction factor for sustainability of the set of technologies used at TL, $S \in (0,1]$

z: vector of random variables.

The problem (P) that policy-makers face, can be formulated as follows:

$$(P) \quad \max E_t \text{ (choosing } B_p, \text{ tec}^p)$$

*subject to restrictions, i.e., budgetary*¹³

For this theoretical model, as E_t approaches its maximum from the left, its partial derivatives are associated with a sign (+ or -), which is consistent with explicit or implicit hypotheses of the model.

$$1. \quad \frac{\partial E_t}{\partial x^d} \times \frac{\partial x^d}{\partial w} \times \frac{\partial w}{\partial R} \times \frac{\partial R}{\partial B_p} > 0$$

$$2. \quad \frac{\partial E_t}{\partial x^p} \times \frac{\partial x^p}{\partial y^p} > 0$$

$$3. \quad \frac{\partial E_t}{\partial x^p} \times \frac{\partial x^p}{\partial p} \times \frac{\partial p}{\partial \phi} < 0$$

$$4. \quad \frac{\partial E_t}{\partial x^p} \times \frac{\partial x^p}{\partial p} \times \frac{\partial p}{\partial K} > 0$$

$$5. \quad \frac{\partial E_t}{\partial x^p} \times \frac{\partial x^p}{\partial p} \times \frac{\partial p}{\partial \alpha} \times \frac{\partial \alpha}{\partial B_p} > 0$$

$$6. \quad \frac{\partial E_t}{\partial S} \geq 0 \quad \text{if } S=1;$$

$$> 0 \quad \text{if } S < 1$$

2.1 EMPIRICAL MODEL

The empirical formulation of the SAT model is as follows:

¹³ This optimization problem should be analyzed using a piecemeal/second best approach, since neoclassical economics cannot be used due to the violation of its fundamental assumptions. A viable alternative would be to use benefit/cost ratio (B/C) indicators or internal rates of return (IRR) PER RESTRICTION to the inter-level mobility for the available stock of technology and PER SUBJECT MATTER for technologies that are still in the development process.

$$VE_T = \sum_{t=0}^T \sum_{k=1}^K \sum_{i=1}^3 ([S_{ik} \times [\beta_{ik}^d \times ((w_{ik}) \times A_{(i-1)kt})] + [\beta_{ik}^p \times (K / (1 + e^{-\alpha(t-\phi_i)}) \times A_{ikt})]] \times p_k^{FOB})$$

where:

- VE_T : value in US dollars of the additional output at time T (simulation horizon). Applying the discount rate to the sequence $\{VE_t\}_{0^T}$, the Net Present Value (NPV) can be calculated.
- t: time period (year).
- k: crop or productive activity (K: total # of items).
- i: technological level, $i \in [1,2,3]$, where 1=L, 2=M and 3=H.
- S: correction factor for sustainability, $S \in (0,1]$
- β^d : productivity gap between actual and attainable yields using AVAILABLE TECHNOLOGY, per TL.
- A: area dedicated to produce k.
- β^p : productivity gap between actual and attainable yields using TECHNOLOGY NOT YET AVAILABLE, per TL.
- K: adoption ceiling. K in (0,1].
- e: base of natural logarithms.
- α : parameter of the sigmoid function, associated with restrictions to adoption of technology.
- ϕ : adoption half-time: number of years elapsed between availability of technology and its adoption by 50% of the farmers.
- p^{FOB} : FOB price of item k.

NOTE: the first term of the equation allows the estimation of the increase in output, at time T, attributable to the adoption of available technology and its optimal use. The second term quantifies the pure effect of NEW TECHNOLOGY (net social benefit).

2.2 REQUIRED INFORMATION

The SAT model requires descriptive and prospective input data, as follows:

GENERAL (descriptive)

- Yield per TL.
- Area per TL.
- Annual inter-level mobility rates (ILMR).
- Price elasticity of supply (whenever possible, it should be discriminated by TL).

SPECIFIC (prospective)

- Importance of the problem to solve or the technical innovation to produce, *i.e.*, yield losses in kg/ha due to a pest or disease (in these cases, information on frequency of occurrence is also required).
 - Geographical area affected by the problem or to benefit from the new technology.
 - New state-of-the-art of production technology, should the research be successful, measured in productivity or quality.
 - Year of availability of the new technology.
 - Research costs (direct, indirect and labor).
-

REFERENCES

- Byerlee,D.; Hesse de Polanco,E. (1982): *La Tasa y la Secuencia de Adopción de Tecnologías Cerealeras Mejoradas: El Caso de la Cebada de Secano en el Altiplano Mexicano*. (Documento de Trabajo, 82/6.) CIMMYT, México.
- Cap,E. (1990): *Agricultural Research Resource Allocation at the National Level in LDCs*. A discussion on priority setting models. Working Paper, University of Minnesota, Minneapolis.
- ; Obschatko,E.; Castronovo,A.; Miranda,O.; Serignese,A. (1993): *Perfil Tecnológico de la Producción Agropecuaria Argentina*. 2 vol. INTA, Dirección

Nacional Asistente de Planificación, Dirección de Planificación Estratégica, Buenos Aires.

da Cruz,E.; de Castro,J.; Tollini,H.; Sugai,Y. (1988): "Ex-Ante Evaluation of Agricultural Research in Brazil". In: *Economics Evaluation of Agricultural Research: Methodologies and Brazilian Applications*. (Eds: Evenson,RE *et al.*) Yale Univ. Press.

Davis,J; Oram,PA; Ryan,JG (1987): *Assessment of Agricultural Research Priorities: An International Perspective*. ACIAR Monograph N° 4.

----- (1984): *A partial equilibrium multi-country model for agricultural research evaluation: derivation of formulae*. ACIAR Research Priorities Project Working Paper N° 4.

Evenson,RE (1977): "Comparative evidence on returns to investment in National and International Research Institutions". In: *Resource Allocation and Productivity in National and International Agricultural Research*. (Ed: Fishel,WL) Univ. of Minnesota Press, Minneapolis.

----- (1988): "Ex-ante Research Evaluation and System Design Assessment". In: *Economics Evaluation of Agricultural Research: Methodologies and Brazilian Applications*. (Eds: Evenson,RE *et al.*) Yale Univ. Press.

-----; Waggoner,PE; Ruttan,VW (1979): "Economic benefits from research: an example for agriculture". *Science* 205, 1101-1107.

Hayami,Y.; Ruttan, V. (1985): *Agricultural Development*. An International Perspective. The Johns Hopkins University Press, Baltimore and London.

INTA (1993): *Caracterización Preliminar para la Fijación de Prioridades en el PAN Cereales y Oleaginosas*. (Publicación Miscelánea, 4.) Dirección Nacional Asistente de Planificación, Buenos Aires.

Pinstrup-Anderson,P; Franklin,D (1977): "A Systems Approach to Agricultural Research Resource Allocation in Developing Countries". In: *Resource Allocation and Productivity in National and International Agricultural Research*. (Eds: Arndt,GM; Dalrymple,DG; Ruttan,VW) University of Minnesota Press, Minneapolis, 416-435.

Piñeiro,ME (1984): *An Analysis of Research Priorities in the CGIAR system: a discussion paper*. FAO, Roma.

Scobie,GM (1979): *Investment in Agricultural Research: Some Economic Principles*. Working Paper N°61, Washington,DC.

Argentina economic forecast:

1999: -1.5% (estimates go as low as -4.0%)

2000: 3.0%

2001-2005: 4.7% annual growth

Source: World Bank

OFFICE OF ECONOMY & ENVIRONMENT

401 M Street, SW (Room 3205)

Washington, DC 20460

FAX COVER SHEET

DATE: July 14, 1999

TO: Joe Aloy

ORGANIZATION: CEAT

MAIL CODE:

PHONE: 395-1455

FAX: 395-6870

FROM: Lianne Clements

ORGANIZATION: US EPA / OPI / CPPD

MAIL CODE: 2175

PHONE: 260-6210

FAX: 260-6405

PAGES INCLUDING COVER SHEET: 2

COMMENT:

Joe-

These are the questions Barros sent over --
do you any clue to the answers particularly
(1, 2, & 4)?

Thankx-

Lianne.

FAX

Date: 7/12/99	
To: Mr. Maurice N. Lefranc Climate Policy and Programs Division U.S. Environmental Protection Agency	From: Vicente Barros Project Manager
Nº de Fax (202) 260-6405	Phone: +5411-4348-8685/8678 Fax: 15411-4348-8678
Country U.S.A	Country Argentina
Subject: Technical Assistance	
Page number Two	
C.C. Barbara De Rosa-Joynt (202) 647-0191 Philiph Covington Fax 15411-4811-1812 /1813	

Dear Maurice Lefranc

Regarding the technical assistance to the project "Working Plan for the Adoption of Argentine GIIGs Emissions Targets," US Assistance in the following items is necessary.

1. Overview of productivity trends for major cereals and oilseed crops in the USA - in particular for corn, wheat, soybean and sunflower (specifically the next decade and a half's prospects for agriculture technology and yields in the USA). We are interested in new technologies that hold potential for increasing yields; the prospective for farmers to adopt these technologies; What are going to be the contributions of genetics, improved management systems, AG chemicals, crop monitoring agriculture and the constraints (economical and others) for the adoption of these technologies.
2. Technological trends in energy efficiency for domestic lighting and home appliances (projections up to 2012).
3. Technological trends (2000-2012) in transport efficiency due to:
 - Improvements in the efficiency of combustion engines
 - Impacts of design, weight and materials in automobiles, trucks and buses on transport efficiency.
4. Projections of international commodity prices of major cereals, oilseeds and beef - up to 2012 (We have a model that requires this input).

David Chien EIA

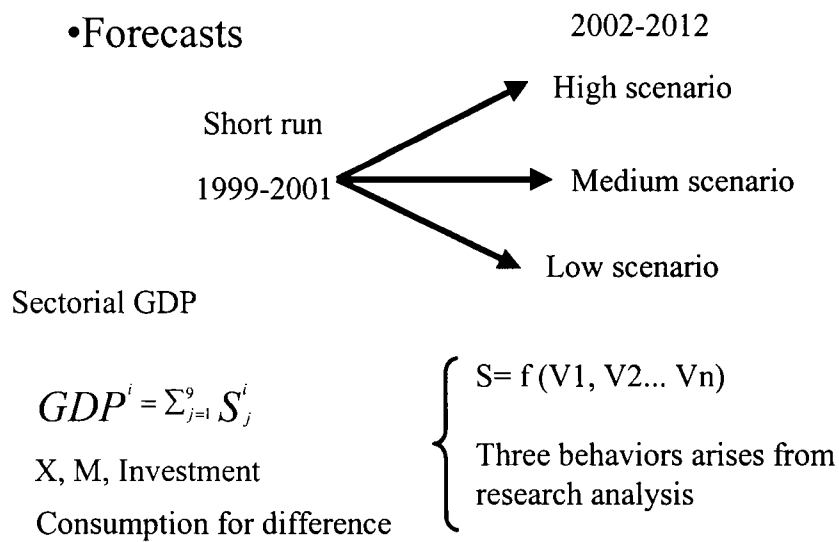
Macroeconomic Forecasts 1999-2012

CEMA, 1999

July 21, 1999

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Methodology



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Short run (1999-2001)

- Assumptions

- World Economy

- Deceleration in growth in US economy

- US interest rates remains in similar in the neighborhood of 5%

- Increase in commodity prices from 2000 year

- Japan under recession in 1999, low take off in 2001 (*more so in 2002*)

- Fiscal Balance in Brazil remains under control

- debt payments ~ 6% of GDP

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oil production expected to recover faster than ag production

99: oil \$20/bbl, ↑10%, then ↑ at very slow rate

Tasas de Variación de los precios de las Commodities							
Tipo de Commodity					Proyecciones		
	1981-90	1991-95	1997	1998	1999	2000	2001
Commodities excl Petróleo	-2.3%	4.1%	2.2%	-15.7%	-6.3%	1.7%	5.0%
Agricultura	-3.2%	5.6%	2.5%	-16.2%	-5.2%	1.8%	3.3%
Metales y Minerales	0.5%	0.3%	1.2%	-16.2%	-10.3%	2.5%	12.2%
Fertilizantes	-2.5%	0.7%	-0.1%	2.0%	-5.2%	-4.1%	0.0%
Petróleo	3.3%	-565.0%	-6.2%	-31.8%	-8.2%	13.0%	10.0%

Commodity Prices

Tasas de Crecimiento en el Mundo					
	1997	1998	1999	2000	2001
Economías Avanzadas	3.20%	2.20%	2%	2.20%	2.60%
Nuevas Economías Ind. de Asia	6.40%	-1.10%	1.50%	3.90%	5.30%
Latinoamérica	5.20%	2.30%	-0.50%	3.50%	4.40%
Países en transición (Europa del Este)	2.20%	-0.20%	-0.90%	2.40%	3.60%

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Short run (1999-2001)

• Assumptions

• Argentina

- Structural reforms depends on scenario basis
- Recession will finish in 2000 year
- Convertibility remains across the years
- From 2000 year Brazil solves internal debt problem (Brazil's GDP growth increase Argentina's export)

no significant new reforms

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Short run (1999-2001)

• Summary of results 1999-2001

	99	00	01
GDP	-3.5%	3.7%	6.1%
Investment	-12.4%	5.3%	10.2%
Consumption	-2.4%	3.9%	5.4%
Imports	-7%	4.8%	9.4%
Exports	0.2%	1.5%	8.5%
Manufactures	-7.4%	3.6%	6.3%
Building	-12.2%	1.8%	8.7%
Agricultural	-2%	3.2%	2.2%

Common to all scenarios

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Long run (2002-2012)

• Assumptions

• World Economy

- Asia solves definitively its financial problem since 2002 (*esp. Japan*)
- Strong growth in Africa, Asia and Eastern Europe (Poland, Hungary)
- Latinoamerican Countries growth will be lower than the past decade
- High increase in trade flows between regions
- Bolivia and Chile will enter into Mercosur Area (*↑ trade*)
- Industrialized countries will grow

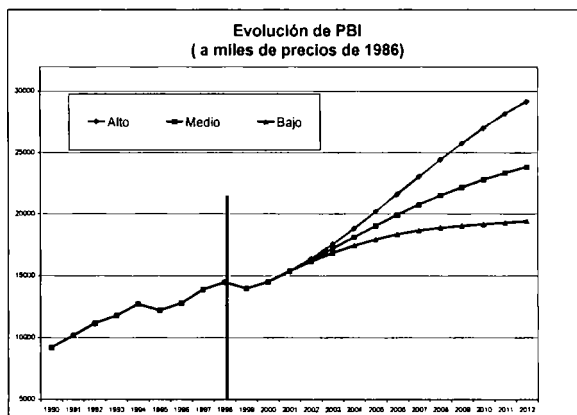
2002-2004	2005-2008	2009-2012
1.1%	0.8%	0.7%

- World inflation remains low < 2%
- Better fiscal balances in Argentina, Brazil and Mexico

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Scenario analysis

• GDP path



Long run rate
2012

High	3.5%
Medium	2.1%
Low	0.7%

Avg rate
01-12

6%

4%

2%

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Scenario analysis

• Assumptions

Tasks

- State reform (more efficiency in expenditures) - e.g. health, justice
- Tax reform (less distortions in taxes) - Δ in structure fiscal policy in direct taxes greater influence on behavior than direct taxes
- Labor flexibility - need strong legal framework to sustain reform
- Stable ratio debt/GDP ($\approx 38\%$, thru-out period)

High scenario	Medium scenario	Low scenario
---------------	-----------------	--------------

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Scenario analysis

Resumen de las estimaciones

Tasa de Crecimiento Promedio del PBI (a precios de 1986)	Alto	Medio	Bajo
1999/1998		-3.5%	
2000/1999		3.7%	
2004/2000	6.8%	5.8%	4.7%
2008/2004	6.7%	4.4%	2.0%
2012/2008	4.5%	2.6%	0.7%

	Industrial Countries	Developing Countries
2008/2004	0.8%	4.9%
2012/2008	0.7%	3.3%

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Scenario analysis

	Producto tasas		
	Escenarios		
	Alto	Medio	Bajo
1990			
1991		10.6%	
1992		9.6%	
1993		5.7%	
1994		8.0%	
1995		-4.0%	
1996		4.8%	
1997		8.6%	
1998		4.2%	
1999		-3.5%	
2000		3.7%	
2001		6.1%	
2002	6.5%	5.8%	5.1%
2003	7.0%	5.6%	4.2%
2004	7.5%	5.5%	3.5%
2005	7.3%	5.1%	2.9%
2006	7.0%	4.7%	2.3%
2007	6.6%	4.1%	1.7%
2008	6.1%	3.7%	1.2%
2009	5.5%	3.1%	0.8%
2010	4.9%	2.8%	0.7%
2011	4.2%	2.4%	0.7%
2012	3.5%	2.1%	0.7%

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Scenario analysis

• GDP by sector

Agricultural perspectives

- Increase en productivity
More fertilizers will be use
- Improve livestock of cows
- Substitution from farmers activities to cattle raising activities

Tasas de Crecimiento						
Sector 1) Agricultura, Caza, Silvicultura y Pesca						
Escenario Medio	2002	2003	2004	2005	2006	
Agricultura, Caza, Si	2.50%	2.7%	3.4%	3.5%	3.3%	
Agricola	2.30%	2.6%	2.3%	2.3%	2.9%	
Pecuario	2.70%	2.9%	5.4%	5.4%	4.0%	
Pesca	3.00%	3.3%	2.5%	2.5%	2.3%	
Silvicultura y Caza	2%	2.5%	2.0%	2.0%	1.8%	

Tasas de Crecimiento						
Sector 1) Agricultura, Caza, Silvicultura y Pesca						
Escenario Medio	2007	2008	2009	2010	2011	2012
Agricultura, Caza, Silv	2.7%	2.0%	1.7%	1.7%	1.5%	1.4%
Agricola	2.5%	1.7%	1.4%	1.6%	1.4%	1.3%
Pecuario	3.5%	2.7%	2.3%	2.0%	1.7%	1.6%
Pesca	1.8%	1.0%	1.0%	1.1%	0.6%	0.6%
Silvicultura y Caza	0.9%	1.0%	1.1%	1.4%	1.4%	1.4%

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Agriculture may open for beet by 2005 - prohibited to date bc of root + with disease

Scenario analysis

Manufacturing Activities

- The automotive industry will continue its positive tendency by a new automotive agreement
- Food industry will improve its competitiveness through its linkage with agriculture sector.
- The petrochemical industry will grow by the higher fertilizer's demand
- During the next five years the cement's demand improves

auto parts ↓
vehicle ↑

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Scenario analysis

Manufacturing Activities

TASA DE VARIACION ANUAL - CIU A 2 DIGITOS							
DESCRIPCION - Escenario Medio	RAMA	2002	2003	2004	2005	2006	
ELABORACION DE PROD. ALIMENTICIOS Y BEBIDAS	15	6.4%	5.8%	5.5%	5.2%	4.9%	
ELABORACION DE PRODUCTOS DE TABACO	16	3.4%	3.0%	2.9%	2.7%	2.2%	
FABRICACION DE PRODUCTOS TEXTILES	17	3.4%	3.0%	2.9%	2.6%	2.2%	
FABR. DE PRENDAS DE VESTIR, TERMINACION Y TEÑIDO DE PIELS	18	3.4%	2.9%	2.9%	2.7%	2.2%	
CURTIDO Y TERMINACION DE CUEROS Y CALZADO	19	5.0%	4.6%	4.4%	4.3%	3.9%	
PROD Y FABR. DE PROD. DE MADERA Y CORCHO EXCEPTO MUEBLES	20	5.0%	4.6%	4.4%	4.3%	3.9%	
FABRICACION DE PAPEL Y PRODUCTOS DE PAPEL	21	5.0%	4.6%	4.4%	4.3%	3.9%	
ACTIV. DE EDICION E IMPRESION Y DE REPROD. DE GRAVACIONES	22	3.4%	3.0%	2.9%	2.7%	2.2%	
FABRICACION DE COQUE, PROD. REFINACION DE PETROLEO	23	5.0%	4.6%	4.4%	4.3%	3.9%	
FABRICACION DE SUSTANCIAS Y PRODUCTOS QUIMICOS	24	6.4%	5.8%	5.5%	5.2%	4.8%	
FABR. DE PROD. DE CAUCHO Y PLASTICO	25	5.0%	4.6%	4.4%	4.3%	3.9%	
FABR. DE OTROS PROD. MINERALES NO METALICOS	26	6.4%	5.8%	5.5%	5.2%	4.8%	
FABRICACION DE METALES COMUNES	27	6.4%	5.8%	5.5%	5.2%	4.8%	
FABR. DE PROD. ELAB. DE METAL, EXCEPTO MAQ. Y EQUIPO	28	3.4%	2.9%	2.9%	2.7%	2.2%	
FABRICACION DE MAQUINARIA Y EQUIPO	29	5.0%	4.6%	4.4%	4.3%	3.9%	
FABR. DE MAQUINARIA DE OFICINA, CONTABILIDAD E INFORMATICA	30	3.4%	3.0%	2.9%	2.7%	2.2%	
FABR. DE MAQUINARIA Y APARATOS ELECTRICOS	31	5.0%	4.6%	4.4%	4.3%	3.9%	
FABR. DE EQUIPO Y APARATOS DE RADIO, TV Y COMUNICACIONES	32	3.4%	2.9%	2.9%	2.7%	2.2%	
FABR. DE INSTRUM. MEDICOS, OPTICOS Y DE PRECISION Y RELOJES	33	3.4%	2.9%	2.9%	2.7%	2.2%	
FABR. DE VEHIIC. AUTOMOTORES, REMOLQUES Y SEMIREMOLQUES	34	5.0%	4.6%	4.4%	4.3%	3.9%	
FABR. DE OTROS TIPOS DE EQUIPO DE TRANSPORTE	35	6.4%	5.8%	5.5%	5.2%	4.8%	
FABR. DE MUEBLES Y OTRAS INDUSTRIAS MANUFACTURERAS	36	5.0%	4.6%	4.4%	4.3%	3.9%	
Industria Manufacturera (VAB)		5.6%	5.0%	4.8%	4.6%	4.2%	

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Scenario analysis

Manufacturing Activities

VALOR AGREGADO BRUTO A PRECIOS DE 1996							
TASA DE VARIACION ANUAL - CIU A 2 DIGITOS							
DESCRIPCION - Escenario Medio	RAMA	2007	2008	2009	2010	2011	2012
ELABORACION DE PROD. ALIMENTICIOS Y BEBIDAS	15	4.5%	3.8%	3.3%	3.0%	2.7%	2.2%
ELABORACION DE PRODUCTOS DE TABACO	16	1.5%	1.2%	0.0%	-1.0%	-1.4%	-1.8%
FABRICACION DE PRODUCTOS TEXTILES	17	1.5%	1.2%	0.0%	-1.1%	-1.4%	-1.9%
FABR. DE PRENDAS DE VESTIR, TERMINACION Y TEÑIDO DE PIELES	18	1.5%	1.2%	0.0%	-1.0%	-1.4%	-1.8%
CURTIDO Y TERMINACION DE CUEROS Y CALZADO	19	3.4%	2.9%	2.4%	2.0%	1.7%	1.2%
PROD Y FABR. DE PROD. DE MADERA Y CORCHO EXCEPTO MUEBLES	20	3.4%	2.9%	2.4%	2.0%	1.7%	1.2%
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FABRICACION DE COQUE, PROD. REFINACION DE PETROLEO	23	3.4%	2.9%	2.4%	2.0%	1.7%	1.2%
FABRICACION DE SUSTANCIAS Y PRODUCTOS QUIMICOS	24	4.5%	3.8%	3.3%	3.0%	2.7%	2.2%
FABR. DE PROD. DE CAUCHO Y PLASTICO	25	3.4%	2.8%	2.4%	2.0%	1.7%	1.2%
FABR. DE OTROS PROD. MINERALES NO METALICOS	26	4.5%	3.8%	3.3%	2.9%	2.7%	2.2%
FABRICACION DE METALES COMUNES	27	4.5%	3.8%	3.3%	2.9%	2.7%	2.1%
FABR. DE PROD. ELAB. DE METAL, EXCEPTO MAQ. Y EQUIPO	28	1.5%	1.2%	0.0%	-1.1%	-1.3%	-1.9%
FABRICACION DE MAQUINARIA Y EQUIPO	29	3.4%	2.9%	2.4%	2.0%	1.7%	1.2%
FABR. DE MAQUINARIA DE OFICINA, CONTABILIDAD E INFORMATICA	30	1.5%	1.2%	0.0%	-1.1%	-1.4%	-1.9%
FABR. DE MAQUINARIA Y APARATOS ELECTRICOS	31	3.4%	2.8%	2.4%	2.0%	1.7%	1.2%
FABR. DE EQUIPO Y APARATOS DE RADIO, TV Y COMUNICACIONES	32	1.5%	1.2%	0.0%	-1.1%	-1.4%	-1.8%
FABR. DE INSTRUM. MEDICOS, OPTICOS Y DE PRECISION Y RELOJES	33	1.5%	1.2%	0.0%	-1.1%	-1.3%	-1.9%
FABR. DE VEHIC. AUTOMOTORES, REMOLQUES Y SEMIREMOLQUES	34	3.4%	2.8%	2.4%	2.0%	1.7%	1.2%
FABR. DE OTROS TIPOS DE EQUIPO DE TRANSPORTE	35	4.5%	3.8%	3.3%	3.0%	2.7%	2.2%
FABR. DE MUEBLES Y OTRAS INDUSTRIAS MANUFACTURERAS	36	3.4%	2.9%	2.4%	2.0%	1.7%	1.2%
Industria Manufacturera (VAB)		3.8%	3.2%	2.6%	2.2%	1.9%	1.4%

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Scenario analysis

Manufacturing Activities

VALOR AGREGADO BRUTO A PRECIOS DE 1996						
TASA DE VARIACION ANUAL - CIU A 3 DIGITOS						
DESCRIPCION - Escenario Medio	RAMA	2002	2003	2004	2005	2006
FABRICACION DE COQUE, PROD. REFINACION DE PETROLEO	23	5.0%	4.6%	4.4%	4.3%	3.9%
FABRICACION DE PROD. DE REFINACION DEL PETROLEO	232	5.0%	4.6%	4.4%	4.1%	3.8%
FABRICACION DE SUSTANCIAS Y PRODUCTOS QUIMICOS	24	6.4%	5.8%	5.5%	5.2%	4.8%
FABRICACION DE SUSTANCIAS QUIMICAS BASICAS	241	6.4%	5.8%	5.5%	5.2%	4.8%
OTROS PROD. QUIMICOS (plaguicidas, pinturas, medicam., prod. Limpieza)	242	6.6%	5.8%	5.5%	5.2%	4.8%
FABR. DE FIBRAS MANUFACTURADAS	243	1.9%	5.8%	5.5%	5.2%	4.8%
FABR. DE PROD. DE CAUCHO Y PLASTICO	25	5.0%	4.6%	4.4%	4.3%	3.9%
PRODUCTOS DE CAUCHO (cubiertas y camaras)	251	3.2%	2.7%	4.4%	4.3%	3.9%
FABRICACION DE PRODUCTOS DE PLASTICO	252	5.3%	4.8%	4.4%	4.3%	3.9%
FABR. DE OTROS PROD. MINERALES NO METALICOS	26	6.4%	5.8%	5.5%	5.2%	4.8%
VIDRIO Y PRODUCTOS DE VIDRIO	261	4.3%	4.5%	4.2%	5.6%	3.5%
PROD. MINERALES NO METALICOS (cemento, ceramica, cal y yeso)	269	7.1%	6.2%	5.9%	5.1%	5.3%
FABRICACION DE METALES COMUNES	27	6.4%	5.8%	5.5%	5.2%	4.8%
INDUSTRIAS BASICAS DE HIERRO Y ACERO	271	6.9%	6.2%	5.7%	5.4%	5.2%
ALUMINIO (primario y semilaborado)	272	4.6%	5.8%	5.7%	5.0%	4.8%
FUNDICION DE METALES (hierro, acero y metales no ferrosos)	273	3.8%	2.1%	2.8%	2.7%	0.9%
FABR. DE AUTOMOTORES, REMOLQUES Y SEMIREMOLQUES	34	5.0%	4.6%	4.4%	4.3%	3.9%
FABRICACION DE VEHICULOS AUTOMOTORES	341	5.9%	6.0%	5.0%	4.3%	4.1%

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Scenario analysis

Mining

MINAS Y CANTERAS					
Escenario medio	2002	2003	2004	2005	2006
PBI Minas y Canteras	422.2	452.4	484.6	517.5	546.7
Tasa de crecimiento	4.1%	7.1%	7.1%	6.8%	5.6%
Metales	83.8	89.7	96.0	100.8	105.8
Tasa de crecimiento	7.0%	7.0%	7.0%	5.0%	5.0%
Petróleo	49153.6	52840.1	56776.7	60708.5	64244.8
Tasa de crecimiento	4.6%	7.5%	7.5%	6.9%	5.8%

oil + gas

MINAS Y CANTERAS						
Escenario medio	2007	2008	2009	2010	2011	2012
PBI Minas y Canteras	573.5	591.1	609.9	635.2	657.8	681.1
Tasa de crecimiento	4.9%	3.1%	3.2%	4.2%	3.6%	3.6%
Metales	111.1	116.7	122.5	128.6	135.1	141.8
Tasa de crecimiento	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Petróleo	67521.3	69783.2	72190.7	75349.1	78212.3	81184.4
Tasa de crecimiento	5.1%	3.4%	3.5%	4.4%	3.8%	3.8%

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*other sectors
transport + communications: telecom expected to take off w/ dereg in 2000
- 98-02 # of phone lines more than double
(up to 42-50 lines/100 households)*

Scenario analysis:

GDP per capita

	High	Medium	Low
1998		7978	
2012	13736	11225	9144
	72%	40%	14%

GDP per capita in other countries

Japan (1997)	33655
Australia (1997)	21274
Italy (1997)	19821
Spain (1997)	13282

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86 source data: w/ 0% positive bias in GDP estimation

**ARGENTINA: PROYECCIONES MACROECONOMICAS PARA EL PERIODO
1999-2012**

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**FLACSO/Argentina
Agosto 1999**

Informe de avance

Este trabajo está dividido en dos secciones. En la primera se presentan proyecciones de producto, volumen de comercio y precios para la economía internacional; de producto, inflación y tasas de interés para Estados Unidos, Japón y la Unión Europea; y de producto e importaciones de bienes y servicios reales para Brasil y Chile. Todas las proyecciones cubren el período 1999-2012. Cuando fue posible (básicamente hasta el año 2008) estas proyecciones fueron realizadas en base a las fuentes secundarias que se citan en el texto. En la segunda sección se presentan proyecciones macroeconómicas desagregadas para la economía argentina para el mismo período, elaboradas en base a un modelo de consistencia macroeconómica. Estas proyecciones se presentarán para tres escenarios (base, alto y bajo), aunque en el presente informe de avance sólo se incluye el escenario base. La principal diferencia entre cada uno de los escenarios es la hipótesis sobre la tasa de crecimiento de las exportaciones en volumen.

I. La economía internacional y regional: proyecciones

Esta sección presenta previsiones de evolución de la economía mundial para el período 1999-2012 elaboradas sobre la base de estudios cualitativos y proyecciones cuantitativas de organismos internacionales y privados.¹ A los efectos expositivos el análisis se ha desagregado en un componente global y otro regional. En el primero se presentan proyecciones de crecimiento de la producción mundial, del volumen de comercio de bienes y servicios reales y del precio de los productos básicos. También se presentan proyecciones de producto, inflación y tasas de interés de corto plazo para Estados Unidos, Japón y la Unión Europea. En el segundo apartado se resumen las previsiones de crecimiento del producto y las importaciones para Brasil y Chile. Como consecuencia del rápido aumento de las transacciones de bienes y servicios, las perspectivas de desempeño económico de la región han adquirido para la Argentina una gran importancia.

a) El contexto global y la economía mundial

Durante los últimos veinticinco años el proceso de integración internacional a través de flujos de comercio, inversión directa y capital de cartera avanzó a un ritmo sin precedentes. Sus principales determinantes fueron la aceleración del progreso técnico (particularmente en las áreas de información y comunicaciones) y las políticas de apertura y des-regulación que redujeron o eliminaron las barreras de política para la integración de los mercados. Este proceso tuvo lugar en el marco de una aceptación generalizada de formas democráticas de gobierno y economías de mercado.

Esta expansión del proceso de integración internacional se acompañó, sin embargo, de un aumento en las diferencias de ingreso per cápita entre las distintas regiones del mundo. En efecto, si bien hasta 1996 la cantidad total de pobres se había mantenido estable en alrededor de un tercio de la población mundial, su proporción

¹ Se utilizaron las siguientes fuentes: World Bank, *Global Commodity Markets 1999*; World Bank, *Global Economic Prospects 1999*; Project Link, *World Outlook 1999*; Central Planning Bureau, *Scanning the Future*, The Hague, 1992; OECD, *The World in 2020*, 1997; United Nations, *Trade and Development Report 1998*; World Bank, *World Development Report 1998*. También se utilizaron las proyecciones de largo plazo realizadas por *The Economist Intelligence Unit*.

había crecido en Europa oriental, América Latina y África.² El proceso de creciente integración internacional también se acompañó de un progresivo aumento en la volatilidad de los movimientos internacionales de capital de cartera, reflejada en fuertes oscilaciones en los flujos netos hacia las economías en desarrollo. Como consecuencia, la administración de esta volatilidad se transformó en un tema clave de política tanto en los países en desarrollo como en los organismos internacionales con responsabilidad en la materia.

No obstante estas dificultades, la mayoría de las proyecciones consultadas prevén una administración no traumática de estas tensiones y anticipan la continuidad de las tendencias a la integración internacional que predominaron durante los últimos veinticinco años. Esta continuidad se fundamenta tanto en consideraciones tecnológicas (una continuación del progreso técnico y de la difusión de innovaciones en el campo de la informática y las comunicaciones) como políticas y regulatorias (una sostenida reducción de las barreras administrativas y de política).

En particular, en el campo del comercio de bienes se anticipa una profundización del proceso de apertura, especialmente en las áreas relativamente más protegidas como el comercio de productos agrícolas de clima templado. También se anticipa una profundización de la liberalización en el comercio y la inversión en el área de los servicios. En esta perspectiva, los acuerdos regionales de comercio son vistos como *building blocks* en el proceso de formación de una economía mundial más integrada, más que como obstáculos o dinámicas que conducen hacia la fragmentación. Estos escenarios también comparten una actitud de confianza respecto a la capacidad para contener la volatilidad dentro de márgenes tolerables a través de un incremento en la transparencia, en la disseminación de la información y en la cooperación internacional.

Tanto en el campo de la profundización del comercio como en el del control de la volatilidad de los mercados, la cooperación a través de las instituciones y regímenes existentes y del desarrollo de otros nuevos ocupa un lugar central. Si bien se anticipa una reducción en el rango y diversidad de las políticas nacionales "aceptables", no se postula una tendencia hacia la uniformidad regulatoria ni hacia la convergencia a un conjunto particular de instituciones y modos de organización de las relaciones entre Estado y mercado.

Las proyecciones para el período 1999-2012 indican que el producto mundial real crecerá a una tasa anual promedio de 3.5%, similar a la de la década de los ochenta y levemente superior a la del período 1990-98. A este ritmo de crecimiento, para fines del período el PIB mundial se habrá expandido un 60% respecto del año base (1998). Adicionalmente, como consecuencia del ritmo de crecimiento relativamente más lento previsto para los países de la OCDE en comparación con el resto del mundo, los primeros verán reducida su participación en el producto mundial (valuado a tipos de cambio de paridad) del 52% al 47% a lo largo del período.

Según estas previsiones, durante el período 1999-2012 la tasa de convergencia promedio para el resto del mundo (países no miembros de la OCDE) será mayor que la registrada en las dos décadas previas. Mientras que se anticipa un crecimiento promedio de la producción de 2.4% anual en los países de la OCDE (superior al del período 1990-98 pero por debajo del registrado en la década del ochenta), para el resto del mundo se

² United Nations, *Social and Development Report 1998*

espera un desempeño agregado mas dinámico que el registrado en las últimas dos décadas. Para los países de la OCDE el aumento de la productividad será la principal fuente de crecimiento en el largo plazo, impulsado por reformas regulatorias para aumentar la competencia, la aceleración del proceso de globalización y progreso técnico y una mejora en la disponibilidad de capital humano.

En el resto del mundo, en cambio, las fuentes del crecimiento de largo plazo son la mejora en la calidad de la fuerza de trabajo, las altas tasas de ahorro y acumulación de capital, las transferencias intra-sectoriales de recursos y un aumento rápido de la productividad. El mejor desempeño esperado para el resto del mundo durante el período 1999-2012 se basa en una mayor continuidad del crecimiento a partir del retorno a condiciones de financiamiento internacional favorables, la recuperación de las tasas de crecimiento de la IED al ritmo de principios de los noventa y el aumento en la participación en los flujos de comercio mundial.

En este escenario el crecimiento del volumen de comercio mundial alcanza una tasa anual promedio del 7%, ligeramente superior a la del período 1990-98 y bastante por encima de la década de los ochenta. Como en los dos periodos anteriores el volumen de comercio crece a tasas mas rápidas que la producción, incrementando los vínculos y la interdependencia entre las economías nacionales. La participación del resto del mundo en el comercio mundial acompaña el comportamiento de su participación en la producción.

En este contexto de desempeño del comercio mundial se anticipa una recuperación de los precios de los productos básicos petroleros y no-petroleros, en contraste con su comportamiento en la década del ochenta y en el período 1990-98. Sobre la base de una reducción parcial de las barreras y los subsidios en los países de la OCDE y de la continuidad en el aumento de la producción en el resto del mundo, se estima que el precio de los productos básicos no-petroleros alcanza a fines del período un nivel un 40% por encima (en dólares corrientes) del de 1990, recuperando las pérdidas producidas por la crisis asiática. Por lo que respecta al petróleo, se espera que el incremento previsto en la demanda mundial para el año 2012 no provoque fuertes incrementos de precios debido al nivel de reservas probadas, las mejoras tecnológicas y la consecuente disminución de los costos de extracción. A pesar de que se proyecta un ritmo de crecimiento anual promedio del 3.6% para el período analizado, para el año 2012 el precio del petróleo aún se encontraría un 7% por debajo (en dólares corrientes) del nivel alcanzado en 1990.

TABLA 1
PRODUCCION, COMERCIO Y PRECIOS DE LOS PRODUCTOS BASICOS,
1998-2012
(porcentaje, tasa de crecimiento anual promedio)

	1980-90	1990-98	1999-04	2005-08	2009-12	1999-2012
PIB real mundial*						
OCDE	3.4	3.0	3.6	3.7	3.1	3.5
Resto del mundo	2.9	2.0	2.5	2.6	2.0	2.4
	3.9	4.1	4.8	4.8	4.0	4.6
Volumen del comercio**	4.9	6.2	6.6	8.1	6.7	7.0
Precio de los productos básicos***						
Petroleros	-4.6	-6.8	5.5	2.7	1.7	3.6
No-petroleros	-2.3	-0.1	3.1	2.8	1.8	2.6

* Tipos de cambio de paridad

** Bienes y servicios reales

*** En dólares corrientes.

Fuente: Las series históricas corresponden al Fondo Monetario Internacional (*World Economic Outlook*) y al Banco Mundial (*Global Commodity Markets*). Las proyecciones son de The Economist Intelligence Unit y estimaciones propias.

Dentro del contexto global reviste particular importancia el comportamiento de las economías de Estados Unidos, Japón y la Unión Europea, las que contribuyen con alrededor del 85 % del producto total de los países de la OCDE y con casi un 50 % de la producción mundial (ambos medidos a tipos de cambio de paridad). Además de su aporte decisivo a la demanda agregada global, el desempeño de estos tres grupos de países influye sobre otras variables clave para las economías en desarrollo, como las tasas de interés que sirven de referencia para el servicio de los pasivos externos.

En el caso de Estados Unidos se prevé la continuación de un proceso de crecimiento económico cercano al potencial de largo plazo en un contexto de baja inflación. En la década de los noventa Estados Unidos registró un prolongado período de expansión económica que hacia fines del periodo había llevado el nivel de actividad por encima del producto potencial de largo plazo. Esta fase de acelerado crecimiento fue provocado por un alto ritmo de expansión de la tasa de progreso tecnológico, acompañado por una política monetaria prudente y una mejora sustancial en la posición fiscal. Como resultado, la economía norteamericana redujo sustancialmente la tasa de desempleo en un contexto de baja inflación y consolidación del presupuesto federal. Este período de crecimiento, sin embargo, se acompañó de una persistente ampliación del déficit en cuenta corriente y de un sostenido aumento en el precio de los activos financieros y reales.

El escenario para el período 1999-2012 tiene implícito una *soft landing* para la administración de ambos desequilibrios. En él se anticipa una tasa de crecimiento promedio del 2.5% anual, impulsada por el aumento de la productividad. Dentro del

período, se espera una ligera tendencia a la desaceleración como consecuencia de un ritmo más lento de crecimiento de la fuerza de trabajo. En Estados Unidos el efecto del envejecimiento relativo de la población sobre el crecimiento es parcialmente compensado por el proceso de consolidación fiscal de largo plazo que se traduce en menores tasas de interés y mayor inversión. El escenario para la economía norteamericana también prevé el mantenimiento de una tasa de inflación cercana a la del período 1990-98 e inferior a la de la década de los ochenta.

En contraste con Estados Unidos y con la propia experiencia de Japón durante el período de posguerra, durante la década pasada la economía de ese país tuvo un desempeño muy desfavorable, especialmente en materia de crecimiento. La interpretación predominante atribuye este desempeño a los efectos de la abrupta corrección en los precios de los activos reales y financieros que se produjo entre fines de la década de los ochenta y principios de los noventa. Los desequilibrios resultantes en las carteras de las instituciones financieras se agravaron hacia fines de los noventa por la crisis asiática, región en donde las instituciones financieras japonesas tenían una elevada exposición.

El escenario previsto para la economía japonesa supone una lenta recuperación de esta prolongada crisis y una gradual convergencia hacia tasas de crecimiento características de un capitalismo maduro. Japón es la economía de la OCDE en la cual se anticipa un mayor efecto negativo de la desaceleración en el crecimiento de la población y su envejecimiento relativo. En este caso, la mayor contribución al crecimiento provendrá del aumento en la productividad total de los factores, impulsada por reformas regulatorias que aumentan la competencia. Así, para el período 1999-2012 se prevé una tasa de crecimiento promedio anual del 1.7%, lo que implica una mejora en relación al desempeño registrado en la década de los noventa, pero sin retornar a los niveles alcanzados del decenio anterior. Este escenario supone un proceso progresivo de internacionalización de la economía y un movimiento gradual hacia formas más afines a las occidentales de organización de los mercados (en particular los mercados de trabajo y capital). La recuperación del crecimiento también descansa en la adopción de políticas fiscales expansivas que tienen éxito en sacar a la economía japonesa de la "trampa de liquidez" en que se encuentra, evitándose la deflación y permitiendo una recuperación del sector financiero.

El escenario previsto para la Unión Europea supone que los objetivos de disciplina monetaria, coordinación fiscal y mayor exposición a la competencia internacional se alcanzan parcialmente en el período analizado. También se presume la consolidación del proceso de integración de un mercado único y su extensión geográfica, auxiliado por la creación de una moneda única que reduce los costos de transacción y mejora la eficiencia en la asignación de recursos. Del mismo modo, la paulatina disminución de los subsidios de la PAC y la progresiva exposición del sector agrícola al comercio internacional contribuyen a mejorar la eficiencia en la asignación de recursos, a la par que la flexibilización de las instituciones que regulan el mercado de trabajo permite disminuir el elevado índice de desempleo que caracterizó el desempeño económico en los noventa.

En este escenario, durante el período 1999-2012 la Unión Europea logra alcanzar tasas de crecimiento promedio similares a las de la década del ochenta, pero en un contexto de menor inflación. Aunque en la década de los noventa se privilegió el control

El cociente Deuda/Exportaciones de bienes y servicios reales y financieros sufrirá un descenso sostenido desde el pico alcanzado en 1999, dado que el crecimiento experimentado por las exportaciones es superior al de la deuda externa total. En cambio, el cociente Servicio de la deuda/Exportaciones de bienes y servicios reales y financieros alcanza un máximo en el año 2002 y luego desciende levemente. No obstante, al final del período no habrá logrado recuperar el nivel alcanzado a fines de los noventa. En este caso, es el peso de las amortizaciones el que impide el mejoramiento del indicador.

b) El escenario alto

Pendiente

c) El escenario bajo

Pendiente

de las presiones inflacionarias a través de políticas monetarias restrictivas, en el escenario previsto se hace posible el ejercicio de políticas monetarias más expansivas en un contexto de consolidación fiscal en los términos establecidos por la EMU, especialmente en aquellos países con posiciones presupuestarias más frágiles.

TABLA 2
OCDE: PRODUCCION, PRECIOS Y TASAS DE INTERES, 1998-2012
(porcentaje, tasa de crecimiento anual promedio)

	1980-90	1990-98	1999-04	2005-08	2009-12	1999-2012
Estados Unidos						
PIB real	2.7	2.5	2.6	2.5	2.3	2.5
Inflación	5.3	2.5	2.8	2.4	2.4	2.6
Tasa de interés*	9.4	5.0	5.4	5.5	5.5	5.5
Japón						
PIB real	4.2	1.1	1.4	2.1	1.9	1.7
Inflación	3.1	1.2	0.5	1.0	1.0	0.7
Tasa de interés*	5.7	2.5	1.6	4.0	4.0	2.6
Unión Europea						
PIB real	2.5	1.8	2.4	2.6	2.4	2.5
Inflación	6.9	3.1	1.7	2.0	2.0	1.9
Tasa de interés*	6.3	5.7	4.1	4.8	4.8	4.5

* Tasas de interés corto plazo.

Fuente: Las series históricas corresponden al Fondo Monetario Internacional (*World Economic Outlook e International Financial Statistics*). Las proyecciones son de The Economist Intelligence Unit y estimaciones propias.

b) El contexto regional

Durante la última década la importancia del contexto regional, y especialmente de Brasil, para la economía argentina se incrementó notablemente. El principal canal a través del cual se hizo sentir dicha influencia fueron los flujos de comercio, cuyo rápido crecimiento incrementó los lazos de interdependencia. En la subregión integrada por los países miembros del Mercosur (excluyendo la Argentina), Chile y Bolivia, Brasil contribuye con un 87% del PIB regional y un 68% de las importaciones totales. Para la Argentina, en 1998 la subregión así definida fue responsable por un 44% de las exportaciones totales de bienes, equivalentes a un 4% del PIB. Las exportaciones a Brasil, en particular, representaron un 2.75% del PIB, una relación aún relativamente baja pero sustancialmente mayor que el 1% anotado en 1991.

El incremento en la importancia de la subregión, y especialmente de Brasil, para la economía argentina durante la década de los noventa tuvo lugar en el marco de un desempeño en materia de crecimiento económico por debajo de la experiencia histórica.

En efecto, durante el período 1990-98 el PIB real de Brasil creció a un ritmo del 2.5% anual, superior al 1.3% registrado en la década de los ochenta pero muy inferior al 7.2% promedio de los veinte años previos. No obstante, el proceso de apertura comercial unilateral y las preferencias negociadas en el ámbito del Mercosur permitieron una rápida expansión de las importaciones totales y del *market share* de la Argentina.

Las proyecciones de desempeño económico para la economía brasileña para el periodo 1999-2012 prevén una recuperación de ritmos de crecimiento mas elevados que los registrados durante los últimos dos decenio (3.2% promedio anual), en un contexto de aumento gradual en el coeficiente de apertura. Los pre-requisitos de este escenario son que la economía brasileña consiga realizar un ajuste fiscal exitoso que le permita generar superávit primarios del orden del 3% del PIB (y así mantener la relación deuda pública/PBI en torno al 50%), además del acceso continuo al flujo de financiamiento internacional. En este contexto, se prevé una expansión de las importaciones de bienes y servicios reales a un ritmo promedio del 6% anual, ligeramente inferior a la tasa de crecimiento del comercio mundial.

Chile también se ha convertido en un socio comercial crecientemente importante para la Argentina, a cuyo mercado destina cerca de un 7% de las exportaciones totales. En contraste con Brasil, durante el período 1999-2012 no se espera que la economía chilena mantenga el desempeño en materia de crecimiento registrado en el período 1990-98 (cercano al 7% anual). La tasa de crecimiento del PIB real proyectada alcanza un 4.7% en un contexto de aumento del coeficiente de apertura. Desde el punto de vista fiscal, este escenario supone que la economía chilena tiene éxito en restablecer el superávit primario a partir del año 2000, en un contexto de mejora en el clima internacional en materia de precios de los productos básicos y crecimiento en la región de Asia-Pacífico.

TABLA 3
BRASIL Y CHILE: PRODUCCION, PRECIOS E IMPORTACIONES, 1998-2012
(porcentaje, tasa de crecimiento anual promedio)

	1980-90	1990-98	1999-04	2005-08	2009-12	1999-2012
Brasil						
PIB real	1.3	2.5	3.3	3.4	3.0	3.2
Tasa de inflación	331.6	326.2	5.8	4.3	3.2	4.5
Importaciones de bs. y serv. reales	-1.8	15.6	4.7	7.0	7.0	6.0
Chile						
PIB real	3.0	6.7	4.4	5.0	5.0	4.7
Tasa de inflación	20.3	10.9	4.0	3.0	3.0	3.4
Importaciones de bs. y serv. reales	1.4	11.8	6.5	7.5	7.5	7.0

Fuente: Las series históricas corresponden a CEPAL (*Anuario Estadístico de América Latina*). Las proyecciones corresponden a The Economist Intelligence Unit, Proyecto Link y estimaciones propias.

II. La economía argentina: proyecciones

Durante la década de los noventa la economía argentina experimentó un proceso de reforma económica que transformó el patrón de desarrollo desde uno orientado hacia el mercado interno y con una amplia participación del Estado en la economía a otro caracterizado por una economía abierta a los flujos comerciales y financieros del exterior y en el que el mercado recuperó el rol de principal mecanismo de asignación de recursos. El Plan de Convertibilidad implementado a principios de la década permitió lograr la estabilidad de precios, contribuyendo a la remonetización de la economía y a la expansión del crédito. En el marco de un renovado acceso de los países en desarrollo al financiamiento externo, la estabilidad macroeconómica y las nuevas oportunidades de negocios que la reforma trajo aparejada resultaron en una rápida expansión del producto, que creció a una tasa promedio anual de 4.2% y recuperó con creces el retroceso experimentando en los ochenta (-1.1%).

La rápida expansión del producto fue, no obstante, concomitante con una ampliación del desequilibrio externo. En efecto, el saldo de la balanza en cuenta corriente pasó de registrar un superávit de \$4.5bn en 1990 a un déficit estimado en \$17bn en 1999. El aumento de las importaciones en un contexto de liberalización comercial y apreciación real del tipo de cambio y los mayores pagos netos de intereses fueron los principales factores que explican el crecimiento del desequilibrio externo. El fluido acceso al mercado internacional de capitales que, con algunas excepciones, predominó durante la década permitió financiar sin mayores dificultades este desequilibrio. Su contrapartida fue un rápido crecimiento de los pasivos externos que, desde 1990, crecieron a una tasa anual promedio del 9%. A pesar de la extensión de la transformación que se ha operado en la economía argentina, ésta aún continúa basando su crecimiento en una fuerte dependencia del ahorro externo. A partir de este diagnóstico se elaboraron tres escenarios (base, alto y bajo) incorporando distintas hipótesis sobre el desempeño del sector externo.

El instrumento utilizado para realizar el ejercicio es un modelo de consistencia macroeconómica construido a partir de identidades contables que permite vincular la oferta y demanda global con sus componentes; con indicadores de precios, ingresos y mercado de trabajo; y con la cuenta corriente y el endeudamiento externo. El modelo está especialmente desarrollado para el análisis del sector externo.

En el modelo utilizado el crecimiento de la demanda agregada resulta de hipótesis de crecimiento independientes para cada uno de sus componentes. El crecimiento del gasto de consumo y la inversión bruta fija se estiman exógenamente. El crecimiento de las exportaciones netas, por su parte, resulta de previsiones independientes para las exportaciones e importaciones de bienes y servicios reales. El crecimiento de las primeras depende de variables exógenas como el crecimiento del volumen de comercio mundial y las importaciones de Brasil, mientras que el de las segundas resulta de computar una elasticidad estimada con respecto a la demanda final.

Las necesidades de financiamiento externo se definen como la suma del saldo en cuenta corriente y las amortizaciones de deuda. Estas necesidades son cubiertas con nuevo endeudamiento de mediano y largo plazo, flujos netos de inversión directa y de cartera y la variación de las reservas internacionales. A partir de hipótesis sobre el comportamiento de estos dos últimos componentes, se estimaron desembolsos de deuda

de mediano y largo plazo compatibles con el mantenimiento de la relación deuda externa/PBI.

El saldo en cuenta corriente (en dólares corrientes) se estimó a partir de previsiones de crecimiento del volumen de exportaciones e importaciones de bienes y servicios reales, evolución de los precios internacionales e ingresos y egresos por concepto de servicios factoriales. La estimación de ingresos y egresos por concepto de servicios factoriales toma en cuenta previsiones sobre tasas de interés, prima de riesgo y la evolución de la posición neta de inversión. Las amortizaciones de deuda se calculan a partir del perfil de amortizaciones del stock de deuda existente a fines de 1998, complementado con supuestos sobre el perfil de amortización de la nueva deuda que se contrae a lo largo del período.

a) El escenario base

Para elaborar el escenario base se utilizaron las previsiones presentadas en la sección I sobre crecimiento del volumen de comercio mundial, crecimiento de las importaciones de Brasil, comportamiento de los precios internacionales y tasas de interés. Paralelamente, se realizaron hipótesis sobre el crecimiento de la IED y la inversión de cartera agregada. En el contexto de la restricción planteada por el sector externo se limitó el crecimiento de los desembolsos de capital de mediano y largo plazo al supuesto de que hacia fines de período (2012) la relación deuda externa/PBI se mantenía a niveles similares a los de inicios del mismo (1999). En el escenario base no se prevé una interrupción en los ingresos netos de capitales del exterior, pero se anticipa un crecimiento de los desembolsos a una tasa que es casi un cuarto de la registrada en el período 1990/98.

En el escenario base el PBI real de la economía argentina crece a una tasa anual promedio de 3.4%, que lleva el PIB per-capita en el año 2012 a u\$s 16,427 (a valores corrientes). Dicho crecimiento es liderado por las exportaciones de bienes y servicios reales (que se expanden a una tasa anual promedio del 6.2%, un punto por debajo de la tasa promedio del período 1990/98) y la inversión bruta fija (que crece a un ritmo promedio de 4.3% anual, aproximadamente la mitad del período 1990/98). En el escenario base tanto el consumo privado como el público crecen por debajo de la tasa de expansión del producto (3.2% y 1.9% respectivamente), permitiendo un aumento de la tasa de ahorro nacional, que pasa del 17.4% en 1999 al 21.6% al final del período (precios corrientes). Las importaciones de bienes y servicios reales también crecen por encima del ritmo de crecimiento del producto, pero a una tasa mucho menor de la del período 1990/98 (5.3% contra 18.3% promedio anual en los noventa). Bajo estos supuestos las exportaciones netas realizan una contribución positiva al crecimiento de la demanda agregada.

Como resultado de la dinámica proyectada para los componentes de la oferta y la demanda agregada, hacia finales del período se prevé una caída de aproximadamente dos puntos porcentuales en la participación del consumo privado y público en el PBI (a precios constantes) respecto de los niveles alcanzados en 1999. La contrapartida es una elevación en la participación de la inversión desde 23.3% en 1999 a 28.1% en el año 2012. A precios constantes también aumenta la participación de las exportaciones e importaciones de bienes y servicios reales en el PBI.

De acuerdo al escenario base, la desaceleración en el crecimiento del producto en comparación con la última década se acompaña del mantenimiento de elevados índices de desempleo. Dadas las proyecciones oficiales sobre la evolución de la población económicamente activa (PEA) y una hipótesis de elasticidad-producto del empleo, la tasa de desocupación se estabiliza en valores altos hasta mediados de la década (cerca del 16%) para reducirse hacia fines del período a un mínimo de 11.3%.³ Dados los supuestos sobre inflación y asumiendo que los costos laborales horarios crecen a la misma tasa que el empleo, se prevé un aumento de 0.4% anual en el salario real. Los costos laborales unitarios, por su parte, caen ligeramente (-0.4% anual) como resultado de un crecimiento previsto de 2.5% en la productividad (una tasa aproximadamente la mitad de la registrada en los noventa).

El crecimiento real de las exportaciones de bienes se estimó con base en el supuesto de que la economía argentina mantiene su participación en los flujos de comercio mundial y en las importaciones brasileñas. El resultado es un crecimiento promedio anual de los volúmenes exportados de 6.3% entre 1999 y 2012, aproximadamente la mitad de la tasa registrada en el período 1990/98.⁴ El crecimiento del volumen de importaciones de bienes (5.7%) se estimó en base a una elasticidad respecto de la demanda doméstica de 1.8, inferior a los valores usualmente estimados para la década de los noventa pero considerada más próxima a valores de largo plazo de dicha elasticidad.⁵

Los supuestos de comportamiento del volumen de exportaciones e importaciones de bienes y servicios reales y las previsiones de precios internacionales dan como resultado una mejora en la balanza comercial, que registra saldos positivos a partir del año 2006.

La balanza de servicios financieros se estimó a partir de las cuentas Utilidades y dividendos e Intereses. Para la primera se hicieron supuestos sobre la remisión y cobro de utilidades y dividendos⁶. El saldo de la cuenta de Intereses, por su parte, resultó de estimaciones independientes de los intereses pagados y ganados. El monto de intereses pagados se estimó con base en la tasa de interés internacional, la prima de riesgo y el *stock* de deuda externa. Los intereses ganados también se estimaron a partir de las previsiones sobre la tasa de interés internacional y la evolución de la inversión financiera argentina en el exterior.⁷

El comportamiento previsto de la balanza comercial permite contrarrestar ligeramente el déficit creciente de la cuenta de servicios financieros, llevando el déficit

³ La elasticidad-producto del empleo para el período 1999/2003 es 0.5 y luego se incrementa gradualmente hasta 0.7 a fines del período.

⁴ El crecimiento del volumen de exportaciones de servicios reales se estimó con base en una elasticidad respecto de las exportaciones de bienes de 0.7 para el período 1999/2008 (similar a la del período 1990/98) y 0.8 a partir del año 2009 y hasta el fin del período.

⁵ Las importaciones de servicios reales también se estimaron con base en el comportamiento previsto de las importaciones físicas de bienes (elasticidad respecto de las importaciones totales de 0.7)

⁶ La remisión de utilidades y dividendos de empresas extranjeras que operan en la Argentina crece a la misma tasa que la inversión extranjera directa (9% promedio anual). Por su parte, los ingresos por concepto de utilidades y dividendos de las empresas argentinas crecerá a una tasa promedio anual del 11%, levemente por encima de la tasa proyectada para la inversión directa de estas empresas en el extranjero.

⁷ Se estima que crece a una tasa promedio anual del 5% (la mitad de la registrada entre 1992 y 1998).

en cuenta corriente hacia fines del período (4.4% del PIB) a niveles similares a los registrados en 1998 (4.3%).

El financiamiento del déficit en cuenta corriente proviene de la entrada de capitales de mediano y largo plazo y de los flujos de inversión extranjera directa y de cartera. La entrada de capitales de mediano y largo plazo es superior al monto estimado de amortizaciones para el período, pero su expansión está limitada por la restricción de que al final del período la relación Deuda externa/PBI se mantenga aproximadamente al mismo nivel que en 1999 (45.3% en 1999 en comparación con 46.4% en el año 2012). Las amortizaciones previstas de deuda externa se formularon a partir de las estimaciones oficiales del *stock* de deuda y su perfil de vencimientos a fines de 1998 e hipótesis sobre la amortización de la nueva deuda contraída durante el período de la proyección.⁸

Los flujos de inversión directa fueron estimados con base en un supuesto sobre crecimiento de los flujos de IED globales y de una participación constante en los mismos de la inversión directa de empresas extranjeras en la Argentina y de empresas argentinas en el exterior. La estimación del comportamiento de la IED mundial se realizó con base en la relación histórica entre su incremento y el del comercio mundial. El resultado es que tanto la IED como la inversión directa de empresas argentinas en el exterior crecen a una tasa promedio anual de 9%.

Se prevé que la inversión de cartera crezca más aceleradamente que la inversión directa, a una tasa promedio anual del 12% para el período 2000/2012. Este supuesto es compatible con el argumento de creciente globalización financiera, donde los flujos de inversión financiera muestran un comportamiento más dinámico que los de inversión directa.

Las reservas internacionales, finalmente, crecen a la misma tasa que el producto, incrementándose en un 56% en el período 1999/2012 (u\$s38.5bn al final del período).

La evolución de la deuda externa está determinada por el comportamiento de los desembolsos de nuevos fondos y las amortizaciones del período. Bajo el supuesto de que el crecimiento de los desembolsos está limitado por la relación deuda/PBI, el incremento de éstos se desacelera con respecto a la década de los noventa. En efecto, en el período 1999/2012 su tasa de crecimiento anual promedio es de aproximadamente un cuarto de la del período 1990/98 (10% y 38%, respectivamente). Las amortizaciones también crecen más lentamente que en los noventa (15% promedio anual en el período 1999/2012 contra 25% en 1990/1998). Como resultado, la deuda externa total crece a una tasa promedio anual del 6% (en el período 1990/1998 lo hizo a una tasa del 9%) y se eleva desde un monto de \$149.4bn en 1999 a \$322.4bn en el año 2012.

⁸ A partir del año 2000 el 70% de la deuda privada de mediano y largo plazo que se coloca en bonos y en bancos se amortiza al año siguiente, en tanto que el 30% restante se amortiza al cabo de cinco años. La totalidad de la deuda del gobierno colocada en el período entre organismos bilaterales se amortiza en diez años. El 30% de la deuda con organismos multilaterales se amortiza a cinco años y el 70% restante a diez años (Este supuesto se basa en la composición actual de la deuda con organismos multilaterales: 30% con el FMI con un plazo promedio de cinco años y 70% con otros organismos con plazos mayores). El 60% de los desembolsos de deuda pública (provenientes de las colocaciones de bonos y de los préstamos bancarios) se amortiza a cinco años y el 40% restante a diez años.

Tabla 4
Proyecciones para la economía argentina: escenario base

	1997	1998	1999-2004	2005-2008	2009-2012	1999-2012	
PIB real (% cambio porcentual anual)	8,6	4,2	2,8	3,9	3,8	3,4	
Consumo privado	8,4	4,1	2,5	3,8	3,8	3,2	
Consumo público	3,2	2,4	1,7	2,0	2,0	1,9	
Inversión bruta interna fija	26,5	7,3	3,3	5,2	5,0	4,3	
Exportaciones de bienes y servicios reales	12,1	7,0	5,0	7,4	6,6	6,2	
Importaciones de bienes y servicios reales	27,6	8,2	3,5	6,8	6,7	5,3	
Demanda doméstica	11,5	4,7	2,6	4,0	4,0	3,4	
Consumo total	7,8	3,9	2,4	3,6	3,6	3,1	
PIB real (millones de pesos de 1986)	13884	14472	17101	19963	23135		
Consumo privado	10211	10627	12331	14315	16618		
Consumo público	1314	1346	1486	1608	1741		
Inversión bruta interna fija	3350	3595	4361	5352	6505		
Exportaciones de bienes y servicios reales	2016	2157	2898	3861	4989		
Importaciones de bienes y servicios reales	3007	3253	4003	5201	6746		
Demanda doméstica	14875	15567	18206	21303	24892		
Consumo total	11525	11973	13817	15923	18359		
PIB per cápita (u\$s)	9070	9434	11114	13494	16427	4,0	<i>nominal</i>
Composición del PIB real (% fin de período)							
Consumo privado	73,5	73,4	72,1	71,7	71,8		
Consumo público	9,5	9,3	8,7	8,1	7,5		
Inversión bruta interna fija	24,1	24,8	25,5	26,8	28,1		
Exportaciones de bienes y servicios reales	14,5	14,9	16,9	19,3	21,6		
Importaciones de bienes y servicios reales	21,7	22,5	23,4	26,1	29,2		
Ahorro e inversión (precios corrientes, fin de período)							
Tasa de ahorro nacional (% del PIB)	17,8	18,2	19,6	20,8	21,6		
Tasa de ahorro externo (% del PIB)	-3,7	-4,3	-5,1	-4,6	-4,4		
Precios, ingresos y mercado de trabajo							
PEA (millones, fin de período)	13,3	13,6	15,5	16,6	17,8		
Tasa de desempleo (% fin de período)	13,7	12,9	16,1	14,4	11,3		<i>unemployment rate</i>
Salario nominal promedio (% variación anual)	0,0	0,0	1,49	2,37	2,63	2,1	
Precios al consumidor (% variación anual)	0,5	0,9	1,3	2,1	2,1	1,8	
Salario real promedio (% variación anual)	-0,5	-0,9	0,2	0,3	0,5	0,3	<i>real wage</i>
Costos laborales unitarios (% variación anual)	-4,8	-4,7	-0,8	-0,1	0,1	-0,4	
Sector externo (millones u\$s, fin del período)							
Exportaciones de bienes	26431	26434	41571	62515	90033	9,1	
Importaciones de bienes	-28554	-29444	-42560	-60908	-86391	8,0	<i>trade balance</i>
Balanza de bienes	-2123	-3010	-989	1607	3641		
Balanza de servicios reales	-4178	-4281	-5645	-7430	-9646	6,0	
Balanza de servicios factoriales	-6171	-7614	-15670	-19841	-25534	9,0	
Balanza en cuenta corriente (como % del PIB)	-12036	-14517	-21832	-25092	-30846	5,5	<i>current acct</i>
Inversión directa neta	4924	3740	7036	9216	12686	9,1	
Reservas internacionales	22440	24876	28480	33226	38487	3,2	
Deuda externa (fin del período)							
Deuda externa total (millones u\$s)	124282	139323	215415	269491	322400	6,2	
Total del servicio de la deuda (millones u\$s)	18602	18570	55916	77565	101849	12,9	
Deuda total/Exportaciones de bienes y servicios (%)	341,74	377,44	379,1	328,9	279,1		
Deuda total/PIB (%)	38,41	40,88	49,9	49,2	46,4		
Debt-service ratio (%)	51,2	50,3	98,4	94,7	88,2		

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DECEMBER 1998

Recovery of confidence, low growth

Since October the restoration of investors' confidence has supported the recovery of capital markets: emerging markets sovereign spreads over US Treasuries fell dramatically, stock prices increased sharply in the US, Latin America and Asia.

The help came from several factors, as a 75-basis points cut of federal funds by the FED; the further reduction of interest rates in other countries; the refunding of the IMF by the US Congress; the commitment of the G-7 to support Brazil and the approval of a large stabilization package for this country; the passage of bank reform legislation in Japan and expectations of supplementary fiscal packages to help markets in Asia; the appreciation of the Japanese yen, reducing the risks of a China devaluation.

The Argentine economy exhibited a good performance until the third quarter, with GDP growing at a rate of 5.8% (first three quarters of the year), but data in manufacturing show a significant fall in the fourth quarter, meaning an annual growth rate of 2% for industry, and probably lower. The trade data, also, indicate the beginning of a negative cycle in activity. Accordingly, we have revised our estimate of growth for 1998 to 4.4%.

There are conflicting signals from the international economy as for the continuation of the recovery of the capital markets. We think that there is no firm evidence to support an earlier recovery of the domestic activity. In our baseline scenario, we analyze the

implications of a stressing first-half with recovery in the second-half of 1999. We add two other scenarios that exhibit, as for 1999, a 2%-band around zero growth, which is our baseline forecast for the most likely development.

This result has strong implications for fiscal policy. Recently the Government has widened his target for the 1999 budget deficit to some US\$ 3 billion and a current account deficit of 4.5 percent of GDP. The revision recognized the slower regional growth and the likely recession in Brazil, with an expected official growth of Argentina GDP at 2.5%. But this figure is higher than our optimistic scenario (1.8%). The loss in revenues, if no major drastic reform is introduced in public expenditure - which we deem unlikely - will require additional financing and no major tax cuts in labor costs.

Assumptions of the forecasts

Baseline forecast This scenario assumes that the adjustment processes of the world economy are completed by the second half of 1999, with a US economy experiencing a moderate growth - lower than trend but still a significant one. The rate of FED funds would be further reduced in 1999, as price and wage increases would be mild.

Asia would show mixed results. Japan is expected to exhibit a moderate recession but with hopes to have advanced by year 2000 a large portion in its banking reform. China would adjust its economy without resorting to a devaluation. Other Asian countries will have more stable economies, permitting some moderate growth of credit and domestic demand.

SYNOPSIS OF THE FORECASTS

		BASELINE		HIGH		LOW	
Probability			50%		20%		30%
Growth of GDP (At Market Prices)	1999		0.0%		1.8%		-2.1%
	2000		5.2%		4.6%		4.1%
	2001		5.5%		5.1%		5.4%
Growth of Deposits (End of Year)	1999		5.4%		9.7%		-5.2%
	2000		13.2%		12.8%		9.4%
	2001		12.6%		11.7%		12.6%
Current Account (US\$ Bill. and as % of GDP)	1999	-13.5	4.0%	-14.9	4.3%	-11.5	3.6%
	2000	-15.5	4.3%	-16.3	4.4%	-13.7	4.0%
	2001	-19.5	4.9%	-20.3	5.0%	-16.1	4.4%
Unemployment (Unemployment Rate)	1999		14.3%		13.9%		15.1%
	2000		13.7%		13.3%		14.9%
	2001		12.9%		13.1%		14.2%
Inflation (GDP Deflator Chg)	1999		-1.3%		-0.3%		-2.8%
	2000		3.4%		3.5%		1.9%
	2001		3.4%		3.2%		2.5%
Productivity growth (Output per Hour)	1999		-0.6%		1.4%		-0.6%
	2000		1.9%		1.5%		1.9%
	2001		2.6%		1.8%		2.5%
Public Bonds Yield (Avge Life 2 Year)	1999		12.2%		10.7%		12.3%
	2000		10.2%		10.1%		10.5%
	2001		9.6%		9.5%		9.7%
LIBOR 180	1999		4.5%		4.8%		4.0%
	2000		4.4%		4.8%		4.2%
	2001		4.7%		5.2%		4.7%
Terms of Trade (Chg)	1999		-0.5%		1.1%		-2.4%
	2000		6.5%		5.9%		3.3%
	2001		1.5%		1.0%		3.9%
Exchange Rate (Chg) (\$/SDR)	1999		1.9%		2.1%		1.5%
	2000		1.8%		2.0%		1.5%
	2001		1.1%		1.5%		2.0%

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The US Dollar is expected to depreciate vis-a-vis the euro, but to appreciate vis-a-vis the yen. As the world GDP will accelerate only marginally, commodity prices will remain more or less at their 1998 averages.

Hard credit will constrain the growth of Latin America economies. Brazil will enter in a deflationary situation, with the GDP adjusting to meet the fiscal target. Some delays in the Brazilian program will maintain some volatility in the financial markets.

This is a complex scenario for Argentina as there will be no degrees of freedom to direct the macroeconomic policies towards social or political endeavors. Policy mistakes are more likely under stress; we assume that no major one is committed in the stressed first half.

As of the year 2000 economies are assumed to return to growth near their long-run path. This will push up commodity prices.

High forecast In this scenario recovery of the world economy is as in the baseline, but with more favorable numbers. Sovereign risks are lower during the transition period. Commodity prices react positively in 1999. The major difference with the baseline is that more liquidity prevails through 1999.

Low forecast This scenario presupposes that the crisis is deeper than in the baseline scenario, yet industrial countries are not expected to enter into recession. The US economy decelerates more sharply (1% in 1999) and Latin America economies are hit by a harder credit constraint, with the private sector being mostly affected through the loss of credit lines. Sovereign spreads are only marginally higher but stock prices in emerging economies are lower than in the baseline. Commodity prices are

struck by a weak demand, and volatility of capital markets is maintained, as investors' confidence does not recover until year 2000. The FED additionally reduces the funds rate and the IMF and the G-7 support the world financial stability through emergency funds and a commitment to act in coordination. A new IMF agreement would be signed admitting a substantial drop in fiscal revenues and providing more scope for external emergency support. World growth since year 2000 is higher but weaker than in the baseline scenario.

Probabilities The most difficult item to predict is, as usual, private investment expenditure. Linked to credit availability, it depends also on many factors and volatile expectations not easily foreseeable. The three scenarios assume that, even with hard credit constraints, private expectations on the macroeconomic regime are stable and positive. In other words, no "regime switching" is expected in the transition phase from the Menem administration to the new one, which coincides with the transition in the international markets from a highly volatile situation to a more stable and foreseeable context. If any change in economic rules appears as realistic for investors, either because of political instability or policy mistakes, then a more sharply decline of private investment than those contained in the present scenarios should be expected.

Our probabilities are 50% for the baseline, 30% for the lower prospects and 20% for the more optimistic scenario.

Summary of the forecasts

We consider briefly the main indicators (see synopsis and statistical tables).

Baseline GDP growth would reach an average of 3.6% over the three-year horizon, with 0 percent in 1999. Most affected in 1999 would be sectors producing tradables goods, as the manufacturing industry (-2.2%) and agriculture (-1%). This reflects the strong decline of the rate of exports' expansion, from a 10 percent in 1998 to zero in 1999.

Investment expenditure is positive but low. Banks would allocate the scarce new credit lines to the construction sector and to the enhancement of capacity and away from consumption, already hit by a sharp increase of the unemployment rate (higher than 14% in 1999).

Real wages are expected to decline by 3% in 1999 with some negative number also in 2000. Some increase could be expected as from 2001.

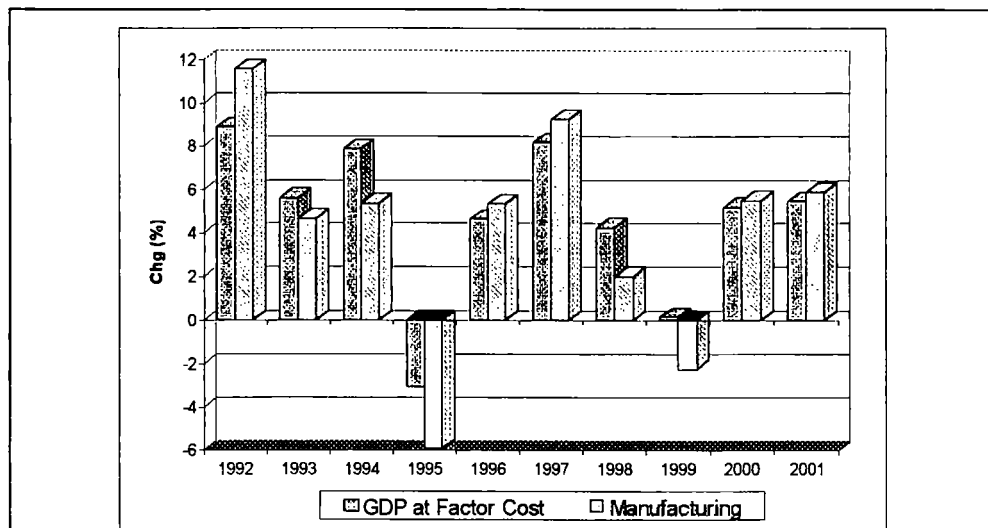
The domestic saving rate is expected to stagnate at an average of 15.9%. The external saving rate (the current account deficit as a % of GDP) would reach a 4% in 1999 and a 4.4% as an average of the three-year period. In 1999, deposits in the financial system would increase only 5% at year-end. The Central Bank would earn some additional US\$ 1 billion reserves.

As from 2000 the economy would return to a growth rate higher than 5% per year. Like in 1997, credit would grow at double-digit figures. The engine of growth will be the investment expenditure and exports (in 2001). Terms of trade are expected to recover in year 2000 the fall of 1998 and 1999.

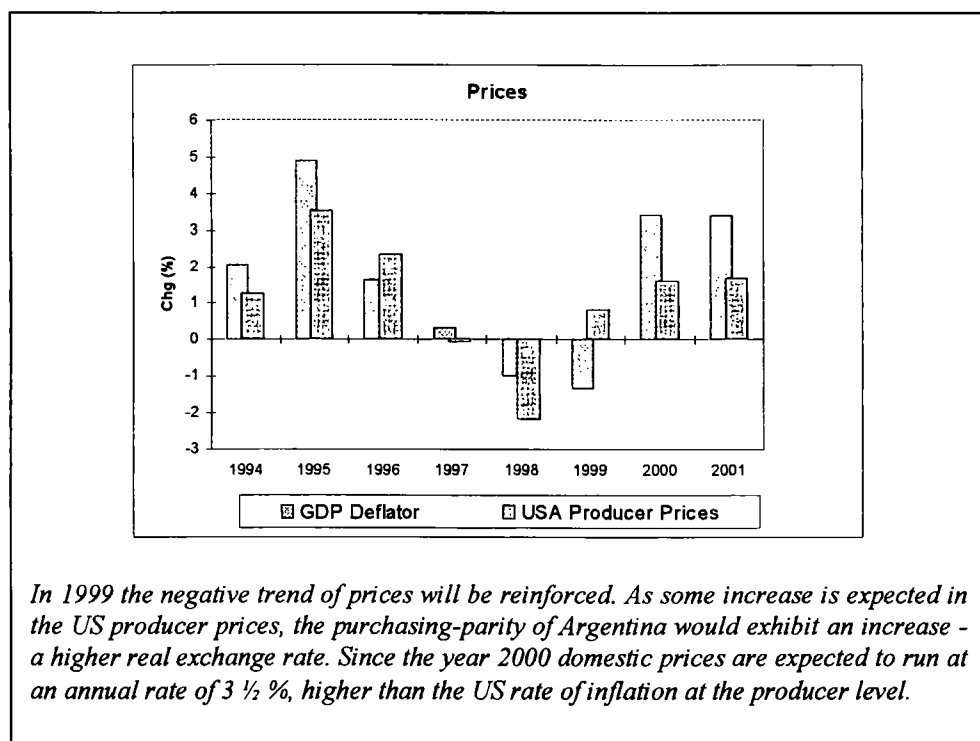
High forecast In this case, GDP grows a 4% as a three-year average, with 1.8% in 1999. Liquidity in the financial sector increases at a rate that is almost twice the baseline rate. Higher profitability of exports through higher prices provide incentives to export growth - but the constraint of the size of the markets remains in 1999 more or less unchanged as from the base. So the engine of growth in 1999 is investment and consumption expenditure on durable goods. The current account deficit reaches 4.3% in 1999 and 5% in 2001.

Low forecast In 1999, a sharp decline of liquidity is reflected in a decline of credit to the private sector (-7%). Lower prices and reduced markets in Latin America are reflected in a fall of exports (-3.2%), with a three-year average of only 4%. GDP declines 2.1% in 1999 and only reaches a 2.5% as average. Investment recedes by 3 ½ %. Tax cuts are postponed until 2001. The unemployment rate reaches 15% in 1999 and declines only to 14% in 2001. Terms of trade fall by another 2.4% in 1999 and recover only moderately in year 2000 and 2001. The current account deficit starts at 3.6% in 1999 and reaches 4.4% in 2001, as a percentage of GDP.

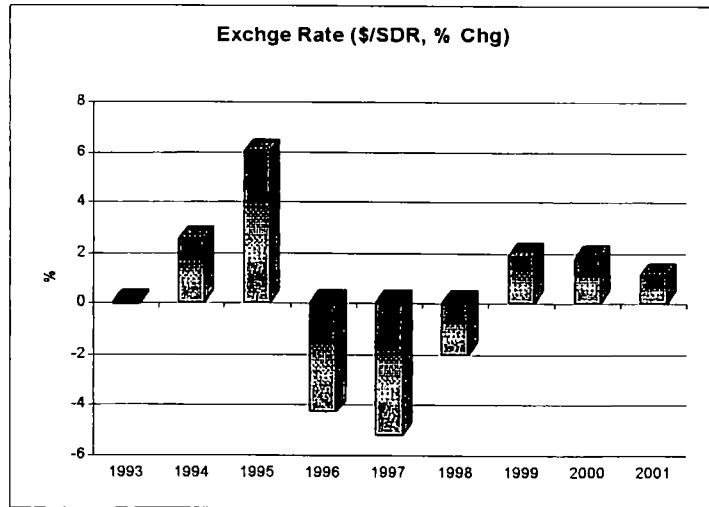
FME FIEL MACROECONOMIC FORECASTS



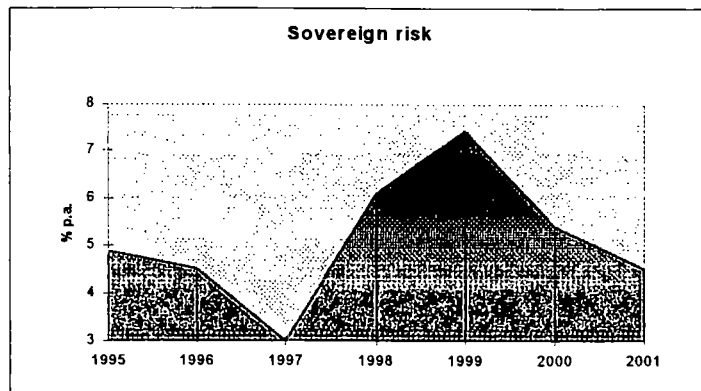
A zero-growth for 1999 is expected for the Argentine economy, with a negative first half balanced by a positive second one. This reflects the stress of the financial markets which is expected to materialize, in particular, if Brazil's interest rates and fiscal deficit do not converge swiftly to sustainable levels. A mild decline of tradable sectors (manufacturing, agriculture) and a positive development in non-tradable ones would balance to zero at the aggregate level, if, as assumed, credit increases at the same pace as in 1996 (2/3%). In the year 2000 growth is expected to resume.



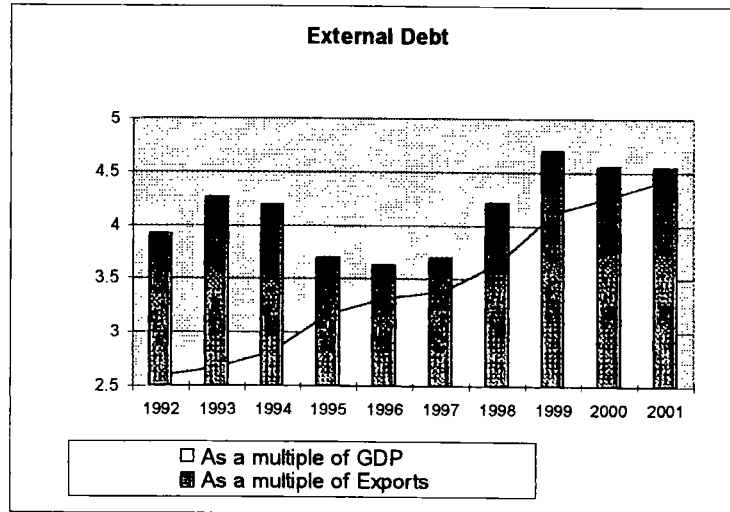
In 1999 the negative trend of prices will be reinforced. As some increase is expected in the US producer prices, the purchasing-parity of Argentina would exhibit an increase - a higher real exchange rate. Since the year 2000 domestic prices are expected to run at an annual rate of 3 1/2 %, higher than the US rate of inflation at the producer level.



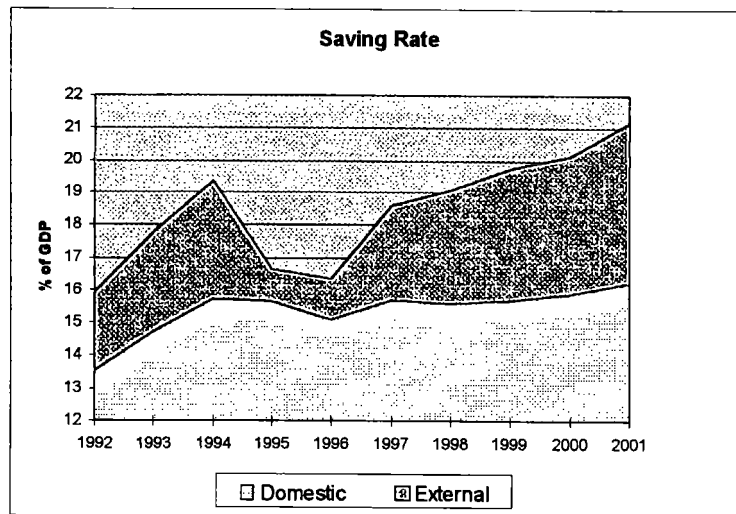
The Argentine Peso is pegged to the US Dollar. From 1996 the revaluation of the dollar has imposed an automatic revaluation of the Peso against major currencies. As from 1999, the euro will tend to appreciate vis-a-vis the dollar, but it is expected that a weak Japanese yen will prevail. The net effect would be a moderate depreciation of the US Dollar as against the composite currency denominated in SDR.



As a consequence of the international financial crisis, by mid-1998 the interest rate faced by emerging markets increased sharply. The sovereign risk peaked in September and October, but after the recovery of investors' confidence in October-November, yields on external debt returned to a 12-13% range. Even as "fundamentals" are more solid in Argentina than in Brazil, it is expected that increased risk aversion from investors, lack of liquidity in the emerging countries and economic turmoil in Brazil will translate into a high level of Argentine risk in 1999, declining thereafter as financial conditions return to a more normal situation. Cuts of the rate by the FED, the expected success of the Brazilian stabilization program and lack of policy mistakes in domestic policies are expected to contribute to the declining Argentine risk by the end of 1999.



Insufficient adjustment of public consumption and zero growth of the economy - with a strong loss of revenues - will mean a fiscal deficit larger than the US\$ 3 billion recently announced by the Government. The Government is expected to phase the tax cuts and resort increasingly to external sources of financing. The relation of external debt to GDP and exports will continue its upward trend and then is expected to stabilize.



The domestic saving rate will exhibit a moderate upwards trend; but the external saving rate, i.e. the current deficit of the balance of payments as a percentage of GDP, will increase from the 1998 level (3 ½ %) to a 4 % in 1999, well below the number expected by the Government. It will be sustainable if Argentine macroeconomic policies are perceived as fundamentally correct by investors and the international scenario behaves as assumed in the baseline - that is no strongly adverse shocks coming from Asia and Latin America, and the US economy decelerating gradually, with no major policy errors from the FED.

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BASELINE FORECAST

TABLES

FIMF FIEL MACROECONOMIC FORECASTS

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BASELINE FORECAST

Table 1 ARGENTINA Gross Domestic Product, Global Supply and Demand

1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates At Constant Prices, %)

1.1 GDP at market prices	4.8	8.6	4.4	0.0	5.2	5.5	3.6
1.2 Imports of Goods and NFS	18.2	27.6	11.8	2.0	12.6	15.8	10.2
1.3 Consumption and Change in Inventories	6.1	7.8	4.2	-0.4	5.5	5.9	3.7
1.4 Gross Domestic Fixed Investment	8.8	26.5	8.1	3.4	9.9	11.5	8.3
1.5 Exports of Goods and NFS	6.7	12.1	10.3	-0.3	7.3	10.3	5.8
1.6 Global Supply and Demand	6.7	11.6	5.7	0.4	6.6	7.6	4.9

(Billions of US dollars)

1.7 GDP at market prices	300.3	327.1	338.0	333.5	362.9	396.0
1.8 Imports of Goods and NFS	28.3	35.4	37.4	38.5	44.1	51.8
1.9 Consumption and Change in Inventories	252.1	272.0	281.7	277.0	299.9	325.6
1.10 Gross Domestic Fixed Investment	49.1	60.8	64.4	65.8	73.1	83.7
1.11 Exports of Goods and NFS	27.4	29.8	29.2	29.2	34.0	38.5
1.12 Global Supply and Demand	328.6	362.6	375.3	372.0	407.0	447.8

Source: Ministry of Economy and Public Works and FIEL estimates and forecast

FMF FIEL MACROECONOMIC FORECASTS

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BASELINE FORECAST

Table 2 ARGENTINA Gross Domestic Product at Factor Cost by Sectoral Origin

	1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates at Constant Prices)

2.1 GDP at Factor Cost	4.6	8.1	4.2	0.1	5.2	5.4	3.6
2.2 Agriculture	3.0	3.3	4.8	-0.9	3.2	3.9	2.1
2.3 Mining	9.7	8.0	2.2	3.2	5.7	8.6	5.8
2.4 Manufacturing	5.3	9.2	2.0	-2.2	5.5	5.9	3.0
2.5 Construction	1.3	23.5	7.5	3.7	8.5	12.7	8.3
2.6 Electricity, Gas and Water	5.0	7.4	5.7	4.2	5.6	6.1	5.3
2.7 Commerce, Restaurants and Hotels	6.4	10.4	4.3	-1.0	5.8	6.2	3.7
2.8 Transport, Storage, Communications	7.0	6.8	5.4	0.7	5.9	6.6	4.4
2.9 Banking and Housing	7.2	7.6	5.1	3.3	3.9	3.8	3.7
2.10 Government and Other Services	0.1	2.9	5.0	-0.5	4.6	2.2	2.1

(Percentages of GDP)

2.11 GDP at Factor Cost	100	100	100	100	100	100	100
2.12 Agriculture	7.7	7.4	7.4	7.4	7.2	7.1	7.2
2.13 Mining	3.0	3.0	3.0	3.0	3.1	3.1	3.1
2.14 Manufacturing	25.0	25.3	24.7	24.1	24.2	24.3	24.2
2.15 Construction	5.6	6.4	6.6	6.9	7.1	7.6	7.2
2.16 Electricity, Gas and Water	2.4	2.3	2.4	2.5	2.5	2.5	2.5
2.17 Commerce, Restaurants and Hotels	16.2	16.5	16.5	16.3	16.4	16.6	16.5
2.18 Transport, Storage, Communications	5.5	5.4	5.5	5.5	5.5	5.6	5.5
2.19 Banking and Housing	16.8	16.7	16.8	17.4	17.2	16.9	17.1
2.20 Government and Other Services	17.8	16.9	17.0	16.9	16.8	16.3	16.7

Source: Ministry of Economy and Public Works and FIEL forecast

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Table 3 ARGENTINA Manufacturing Industry - GDP by Subsector

	1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates at Constant Prices)

3.1 GDP Manufacturing Industry	5.3	9.2	2.0	-2.2	5.5	5.9	3.0
3.2 Food Products, Beverages and Tobacco	1.9	2.0	2.7	0.5	3.4	3.6	2.5
3.3 Textiles, Clothing and Leather Products	8.5	1.1	-3.3	-4.9	4.7	2.4	0.7
3.4 Wood Products and Furniture	12.5	4.5	4.5	-0.8	3.9	4.7	2.6
3.5 Paper and Printing	7.3	4.5	2.1	-0.1	7.2	7.3	4.8
3.6 Chemicals, Petroleum, Rubber, Plastic	2.7	3.3	2.1	1.4	6.6	2.2	3.4
3.7 Nonmetallic Minerals	6.3	17.0	5.9	-0.7	7.9	11.7	6.3
3.8 Iron, Steel and Nonferrous Metal	12.5	6.9	3.1	-4.1	7.4	9.7	4.3
3.9 Machinery, Transport and Equipment	8.0	29.7	2.2	-7.7	5.5	11.1	2.9
3.10 Other Manufacturing Industries	5.3	9.0	3.1	-0.8	5.3	4.4	3.0

(Percentages of GDP)

3.11 GDP Manufacturing Industry	25.0	25.3	24.7	24.1	24.2	24.3	24.2
3.12 Food Products, Beverages and Tobacco	6.1	5.7	5.7	5.7	5.6	5.5	5.6
3.13 Textiles, Clothing and Leather Products	2.7	2.5	2.3	2.2	2.2	2.1	2.2
3.14 Wood Products and Furniture	0.6	0.5	0.5	0.5	0.5	0.5	0.5
3.15 Paper and Printing	1.6	1.5	1.5	1.5	1.5	1.5	1.5
3.16 Chemicals, Petroleum, Rubber, Plastic	6.3	6.0	5.9	5.9	6.0	5.8	5.9
3.17 Nonmetallic Minerals	1.0	1.0	1.1	1.1	1.1	1.1	1.1
3.18 Iron, Steel and Nonferrous Metal	1.3	1.3	1.3	1.2	1.3	1.3	1.3
3.19 Machinery, Transport and Equipment	5.3	6.4	6.2	5.8	5.8	6.1	5.9
3.20 Other Manufacturing Industries	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source FIEL estimates and forecast

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BASELINE FORECAST

Table 4 ARGENTINA Balance of Payments and External Debt

	1996	1997	1998	1999	2000	2001
<i>(Millions of US Dollars)</i>						
4.1 Current Account (4.2+4.9+4.13)	-3787	-9429	-11805	-13496	-15546	-19457
4.2 Resource Balance (4.3-4.6)	-873	-5586	-8219	-9269	-10127	-13251
4.3 Exports of Goods and NFS	27429	29829	29170	29187	33957	38532
4.4 Merchandise Exports (FOB)	23811	26025	25330	25101	29687	34060
4.5 Non Factor Services	3618	3804	3840	4087	4270	4472
4.6 Imports of Goods and NFS	28302	35415	37389	38457	44083	51783
4.7 Merchandise Imports (CIF)	23761	30355	32398	33395	38744	46109
4.8 Non Factor Services	4541	5060	4991	5061	5339	5674
4.9 Net Factor Service Income	-3248	-4190	-4271	-5052	-6068	-6790
4.10 Interest Perceived on External Assets	4587	5384	5447	4730	4801	5460
4.11 Interest Accrued on External Debt	-5913	-7139	-7127	-7049	-7804	-8905
4.12 Royalties and Dividends	-1922	-2435	-2591	-2733	-3065	-3345
4.13 Current Transfers	334	347	685	826	648	585
4.14 Balance on Capital Account	7569	12491	13870	14501	18102	22140
4.15 Public	9580	6530	10580	12058	10458	12736
4.16 Private	-2011	5961	3290	2443	7643	9404
4.17 Net International Reserves (change)	3782	3062	2066	1006	2555	2683
4.18 Liquid External Assets of Central Bank (end of year)	19745	22807	24873	25878	28434	31117
4.19 External Debt	99468	110171	122903	137360	154682	175179
4.20 Public	73612	74775	84155	96213	107672	121608
4.22 Private	25856	35396	38748	41146	47010	53571
4.23 External Debt/Total Exports	3.63	3.69	4.21	4.71	4.56	4.55

(Annual Growth Rates, %)

**Average
1999/2001**

4.24 Exports of Goods and NFS	13.3	8.8	-2.2	0.1	16.3	13.5	10.0
4.25 Merchandise Exports (FOB)	13.6	9.3	-2.7	-0.9	18.3	14.7	10.7
4.26 Non Factor Services	11.7	5.2	0.9	6.4	4.5	4.7	5.2
4.27 Imports of Goods and NFS	17.0	25.1	5.6	2.9	14.6	17.5	11.7
4.28 Merchandise Imports (CIF)	18.1	27.8	6.7	3.1	16.0	19.0	12.7
4.29 Non Factor Services	11.7	11.4	-1.4	1.4	5.5	6.3	4.4
4.30 Net Factor Service Income	1.0	29.0	1.9	18.3	20.1	11.9	16.8

Source: Ministry of Economy and Public Works, adjusted as from 1993, and FIEL forecast

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BASELINE FORECAST

Table 5 ARGENTINA Population, Employment and Capacity Utilization

1996	1997	1998	1999	2000	2001
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(Thousands, % rates and index numbers)

5.1 Population (Mid-year)	35220	35672	36125	36578	37032	37487
5.2 Active Population	13983	14366	14458	14698	14976	15255
5.3 Activity rate (%)	39.7	40.3	40.0	40.2	40.4	40.7
5.4 Employment	11575	12226	12593	12598	12923	13287
5.5 Workers	8582	9083	9358	9343	9551	9819
5.6 Non Workers	2993	3143	3235	3255	3372	3468
5.7 Unemployment Rate - Total (%)	17.2	14.9	12.9	14.3	13.7	12.9
5.8 Hours per worker - industry (1986=100)	102.6	104.4	101.3	102.2	103.2	103.2
5.9 Capacity Utilization - industry (%)	75.6	76.9	74.5	71.5	75.5	76.4

(Annual Growth Rates, %)

**Average
1999/2001**

5.10 Population	1.3	1.3	1.3	1.3	1.2	1.2	1.2
5.11 Active Population	0.7	2.7	0.6	1.7	1.9	1.9	1.8
5.12 Employment	0.9	5.6	3.0	0.0	2.6	2.8	1.8
5.13 Workers	2.6	5.8	3.0	-0.2	2.2	2.8	1.6
5.14 Non Workers	-3.8	5.0	2.9	0.6	3.6	2.8	2.4

*Source: INDEC (5.1 and 5.7) and FIEL estimates based on INDEC, and forecast.
Unemployment Rate is an annual average and does not include "underemployment"*

FMF FIEL MACROECONOMIC FORECASTS

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BASELINE FORECAST

Table 6 ARGENTINA Gross Fixed Investment

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates At Constant Prices, %)</i>						Average 1999/2001
6.1 Gross Fixed Investment	8.8	26.5	8.1	3.4	9.9	11.5	8.3
6.2 Construction	1.6	22.4	7.5	3.7	8.4	12.5	8.2
6.3 Public	-2.6	22.4	2.0	0.0	6.5	5.0	3.8
6.4 Private	2.0	22.4	8.0	4.0	8.6	13.2	8.6
6.5 Machinery, Tools and Transport Equipment	17.1	30.6	8.6	3.1	11.3	10.5	8.3
6.6 Investment-Output Ratio at constant prices	0.207	0.241	0.250	0.258	0.270	0.285	0.271

(Billions of US dollars)

6.7 Gross Fixed Investment	49.1	60.8	64.4	65.8	73.1	83.7
6.8 Construction	30.9	37.2	39.8	40.7	45.2	52.7
6.9 Public	2.9	3.6	3.6	3.6	3.9	4.2
6.10 Private	27.9	33.7	36.2	37.1	41.3	48.5
6.11 Machinery, Tools and Transport Equipment	18.2	23.5	24.6	25.1	27.9	31.0

Source: Ministry of Economy and Public Works and FIEL estimates (6.3/6.4) and forecast

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Table 7 ARGENTINA Consumption and Saving

	1996	1997	1998	1999	2000	2001	
							Average
							1999/2001
	<i>(Annual Growth Rates At Constant Prices, %)</i>						
7.1 Consumption plus Change in Inventories	6.1	7.8	4.2	-0.4	5.5	5.9	3.7
7.2 Public	-1.4	-1.2	-0.4	0.0	0.5	1.0	0.5
7.3 Private	7.1	8.8	4.7	-0.4	6.0	6.4	4.0
7.4 Durable Goods	13.1	10.2	10.7	-1.7	9.2	11.2	6.2
7.5 Non-Durable and Services	6.8	8.8	4.3	-0.3	5.8	6.1	3.9
7.6 GDP Per Capita	3.4	7.2	3.0	-1.2	3.9	4.3	2.3
7.7 Total Consumption Per Capita	4.8	6.4	2.9	-1.6	4.2	4.6	2.4
	<i>(Percentage of GDP, current prices)</i>						
7.8 Saving Rate	16.3	18.6	19.1	19.7	20.2	21.1	20.3
7.9 Domestic Saving Rate	15.1	15.7	15.6	15.7	15.9	16.2	15.9
7.10 External Saving Rate	1.3	2.9	3.5	4.0	4.3	4.9	4.4
	<i>(Percentage of GDP, constant prices)</i>						
7.11 Consumption plus Ch. Inventories	83.7	83.0	82.9	82.5	82.7	83.0	82.8
7.12 Public	9.0	8.1	7.8	7.8	7.4	7.1	7.4
7.13 Private	74.7	74.9	75.1	74.8	75.3	75.9	75.3

Source: Ministry of Economy and Public Works and FIEL estimates (based on INDEC) and forecast

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Table 8 ARGENTINA Productivity, Employment by Sectoral Origin and Labor Income

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates, %)</i>						Average 1999/2001
8.1 Average Productivity by Person	1.9	2.2	1.2	0.3	2.9	2.6	1.9
8.2 Average Productivity by Hour Worked	-1.1	0.4	4.3	-0.6	1.9	2.6	1.3
8.3 Total Employment (Workers)	2.6	5.8	3.0	-0.2	2.2	2.8	1.6
8.4 Agriculture	-1.0	-1.2	0.3	-0.5	-0.5	-0.5	-0.5
8.5 Mining	-0.8	2.0	4.2	1.2	-0.5	2.5	1.1
8.6 Manufacturing	-4.0	4.1	4.6	-4.9	0.3	2.2	-0.8
8.7 Construction	-0.4	18.7	7.1	-2.3	4.9	13.8	5.5
8.8 Electricity, Gas and Water	2.8	-1.6	0.9	1.4	1.4	1.6	1.5
8.9 Commerce, Restaurants and Hotels	0.6	4.0	5.8	1.6	3.6	2.0	2.4
8.10 Transport, Storage, Communications	2.4	3.9	0.7	-0.4	1.8	1.4	0.9
8.11 Banking and Housing	-2.2	8.5	1.3	0.9	1.1	0.6	0.8
8.12 Government and Other Services	7.4	7.1	2.0	0.8	2.6	2.9	2.1
9.13 Non-Government	15.2	13.2	3.6	1.3	3.9	4.0	3.1
8.14 Government	-1.4	-1.2	-0.4	0.0	0.5	1.0	0.5
8.15 Average Labor Income (Real)	0.9	0.1	-1.5	-2.8	-0.9	0.6	-1.0
8.16 Average Labor Cost (US\$)	-3.6	-1.4	-1.1	-2.2	0.7	4.6	1.0
8.16 Average Hourly Income (Real)	-2.0	-1.6	1.6	-3.7	-1.9	0.6	-1.7

Source: FIEL estimates and forecast

Deflator: Consumer Price Index. Labor Cost: Average Wage in US\$ adjusted by labor taxes (FIEL estimate)

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Table 9 ARGENTINA and Regional Exchange Rates Indices

	1996	1997	1998	1999	2000	2001	
<i>(\$/US\$, \$/SDR and Index Numbers 1986=100)</i>							
9.1 Argentina Exch Rate \$/US\$	1.00	1.00	1.00	1.00	1.00	1.00	
9.2 Argentina Exch Rate \$/SDR	1.45	1.38	1.35	1.37	1.40	1.41	
9.3 Argentina Index of Real Exch Rate \$/US\$	57.4	57.2	56.5	57.8	56.7	55.8	
9.4 Brazil Index of Real Exchange Rate	53.7	53.6	55.7	59.0	59.0	57.9	
9.5 Chile Index of Real Exchange Rate	65.8	64.0	67.9	69.2	69.2	68.2	
<i>(Annual Growth Rates, %)</i>							
							Average 1999/2001
9.6 Argentina Exch Rate \$/US\$	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.7 Argentina Exch Rate \$/SDR	-4.3	-5.2	-2.0	1.9	1.8	1.1	1.6
9.6 Argentina Real Exch Rate \$/US\$	0.7	-0.4	-1.2	2.2	-1.8	-1.6	-0.4
9.9 Brazil Real Exchange Rate	-4.3	-0.2	3.9	6.0	0.0	-2.0	1.3
9.10 Chile Real Exchange Rate	2.8	-2.7	6.0	2.0	0.0	-1.5	0.2

Source: FIEL estimates and forecast. Real Exchange Rate: Purchasing Power Parity \$/US\$, using US Producer Price Index (Total) and each country implicit deflator of GDP. SDR = Special Drawing Rights

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Table 10 ARGENTINA Terms of Trade

1996	1997	1998	1999	2000	2001
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(Index Number 1986=100)

10.1 Terms of Trade	131.6	130.1	122.2	121.5	129.5	131.4
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(Annual Growth Rates, %)

**Average
1999/2001**

10.2 Unit Value of World Exports	-0.8	-7.7	-6.0	0.5	3.6	3.0	2.4
10.3 Unit Value of Argentina Exports	6.2	-3.0	-11.3	0.3	8.4	2.9	3.9
10.4 Merchandises	6.7	-3.5	-12.4	0.0	9.6	3.3	4.3
10.5 Primary and Agrobased Products	11.5	-4.5	-14.0	-1.2	14.5	3.8	5.7
10.6 Manufacturing	-5.2	-0.9	-1.5	1.3	2.8	2.3	2.1
10.7 Energy	22.0	-6.0	-35.6	1.3	8.5	6.8	5.5
10.8 Non Factor Services	2.1	1.0	-2.2	0.8	1.6	1.7	1.4
10.9 Unit Value of Argentina Imports	-1.0	-1.9	-5.6	0.9	1.8	1.4	1.3
10.10 Merchandises	-1.2	-1.7	-5.4	0.9	2.1	1.7	1.6
10.11 Capital Goods	-4.4	-2.1	-5.1	1.9	0.3	-0.4	0.6
10.12 Intermediate Goods	-3.6	-2.4	-4.2	0.3	2.3	1.9	1.5
10.13 Consumption Goods	2.9	1.4	-4.4	1.3	3.3	3.0	2.5
10.14 Energy	32.2	-2.0	-35.0	1.3	9.0	7.0	5.8
10.15 Non Factor Services	2.0	0.6	-4.5	0.9	2.0	2.0	1.6
10.16 Terms of Trade	7.2	-1.1	-6.1	-0.5	6.5	1.5	2.5

Source: FIEL estimates based on INDEC, and FIEL forecast

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Table 11 ARGENTINA Trade

	1996	1997	1998	1999	2000	2001	
							Average
							1999/2001
	<i>(Quantity Indexes, Annual Growth Rates, %)</i>						
<i>Factors affecting Trade</i>							
11.1 World GDP	2.9	3.2	1.6	1.9	2.7	2.8	2.5
11.2 GDP US	3.4	3.9	3.6	1.7	2.3	2.1	2.0
11.3 Regional GDP: Brazil	2.9	2.9	0.4	-2.5	4.5	5.0	2.3
11.4 Regional GDP: Chile	7.4	7.1	4.2	2.6	4.8	6.1	4.5
<i>Trade Growth</i>							
11.5 Exports	6.7	12.1	10.3	-0.3	7.3	10.3	5.8
11.6 Merchandises	6.4	13.2	11.1	-0.9	7.9	11.1	6.0
11.7 Primary and Agrobased Products	8.5	8.1	17.6	-3.3	8.7	11.7	5.7
11.8 Manufacturing	-2.7	28.7	3.6	3.5	5.0	7.6	5.4
11.9 Energy	16.6	5.5	3.2	0.0	10.7	15.7	8.8
11.10 Non Factor Services	9.4	4.2	3.2	5.5	2.8	3.0	3.8
11.11 Imports	18.2	27.6	11.8	2.0	12.6	15.8	10.2
11.12 Merchandises	19.5	30.0	12.8	2.1	13.7	17.0	10.9
11.13 Capital Goods	23.6	40.5	9.7	5.3	12.3	14.9	10.8
11.14 Intermediate Goods	22.4	28.4	12.7	0.8	16.7	18.7	12.1
11.15 Consumption Goods	17.8	25.5	15.2	1.7	8.6	16.5	8.9
11.16 Energy	-21.1	3.9	28.4	0.1	5.9	7.0	4.3
11.17 Non Factor Services	9.6	10.8	3.2	0.6	3.4	4.2	2.7
11.18 Index of openness	18.6	19.9	19.7	20.3	21.5	22.8	21.5

Source: International: IMF, INDEC, FIEL estimate and forecast
Index 11.18 is defined as (Exports+Imports)/GDP at current prices

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Table 12 ARGENTINA Prices

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Average Growth Rates, %)</i>						Average 1999/2001
12.1 GDP Deflator	1.7	0.3	-1.0	-1.3	3.4	3.4	1.8
12.2 General Wholesale Price Index	3.2	0.1	-3.1	-2.2	3.3	3.4	1.5
12.3 Consumer Price Index	0.2	0.5	0.9	-0.4	3.5	3.4	2.1
12.4 Goods	0.0	-0.3	0.7	-0.7	3.2	4.8	2.4
12.5 Services	0.4	1.6	1.3	-0.1	3.8	1.6	1.8
12.6 Construction Price Index	-4.3	-1.5	0.0	-1.7	1.6	3.9	1.3

*Source: 12.1: as estimated by the Ministry of Economy and Public Works. FIEL forecast based on the same methodology
12.2/12.6 INDEC and FIEL forecast*

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Table 13 ARGENTINA and World Financial Indicators

	1996	1997	1998	1999	2000	2001	
(Stocks in Millions of US Dollars)							
13.1 Total Domestic Deposits (End of Year)	53066	68172	76444	80547	91200	102719	
13.2 Total Domestic Deposits (Annual Average)	50219	62786	74048	79383	88919	100455	
13.3 Loans to Private Sector (Annual Average)	51179	57780	64587	66015	75002	84732	
(Annual Growth Rates, %)							
							Average 1999/2001
13.4 Total Domestic Deposits (End of Year)	22.6	28.5	12.1	5.4	13.2	12.6	10.4
13.5 Total Domestic Deposits (Annual Average)	20.1	25.0	17.9	7.2	12.0	13.0	10.7
13.6 Loans to Private Sector (Annual Average)	2.9	12.9	11.8	2.2	13.6	13.0	9.6
(Annual Averages in Percentage)							
<i>Argentina Interest Rates</i>							Average 1999/2001
13.7 Deposit Rate in Pesos 30 days, Nominal	6.8	6.2	6.2	5.3	5.5	6.0	5.6
13.8 Deposit Rate in Pesos, Real	5.0	5.9	7.3	6.7	2.0	2.5	3.8
13.9 Country Risk (Spread - Avge. Life 2 Year)	4.5	3.0	6.1	7.4	5.4	4.5	5.8
(Annual Growth Rates, % and Annual Averages)							
<i>International</i>							
13.10 US Producer Price Index (Total)	2.3	-0.1	-2.2	0.8	1.6	1.7	1.4
13.11 US Consumer Price Index (All Urban)	2.9	2.3	1.6	2.4	2.7	2.8	2.6
13.12 Oil Prices (WTI)	20.1	-6.5	-35.0	1.3	9.0	7.0	5.8
13.13 LIBOR 180	5.6	5.9	5.6	4.5	4.4	4.7	4.5
13.14 US Treasury 10 Years	6.4	6.4	5.3	4.8	4.8	5.1	4.9

Source: 13.1/13.7: Central Bank and FIEL estimates and forecast. Deposit rate deflator: implicit GDP deflator.
13.9 estimate based on yield over LIBOR. 13.10/13.14: IMF, and FIEL forecast

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HIGH FORECAST

TABLES

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Table 1 ARGENTINA Gross Domestic Product, Global Supply and Demand

	1996	1997	1998	1999	2000	2001	Average 1999/2001
<i>(Annual Growth Rates At Constant Prices, %)</i>							
1.1 GDP at market prices	4.8	8.6	4.4	1.8	4.6	5.1	3.9
1.2 Imports of Goods and NFS	18.2	27.6	11.8	6.5	11.6	14.6	10.9
1.3 Consumption and Change in Inventories	6.1	7.8	4.2	1.8	4.8	5.3	3.9
1.4 Gross Domestic Fixed Investment	8.8	26.5	8.1	7.4	8.9	10.5	8.9
1.5 Exports of Goods and NFS	6.7	12.1	10.3	0.2	7.9	10.3	6.2
1.6 Global Supply and Demand	6.7	11.6	5.7	2.7	6.0	7.0	5.3

(Billions of US dollars)

1.7 GDP at market prices	300.3	327.1	338.0	343.2	371.6	402.9
1.8 Imports of Goods and NFS	28.3	35.4	37.4	40.3	45.8	53.2
1.9 Consumption and Change in Inventories	252.1	272.0	281.7	284.9	306.8	330.9
1.10 Gross Domestic Fixed Investment	49.1	60.8	64.4	68.6	75.8	85.9
1.11 Exports of Goods and NFS	27.4	29.8	29.2	29.9	34.8	39.4
1.12 Global Supply and Demand	328.6	362.6	375.3	383.4	417.4	456.1

Source: Ministry of Economy and Public Works and FIEL estimates and forecast

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Table 2 ARGENTINA Gross Domestic Product at Factor Cost by Sectoral Origin

	1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates at Constant Prices)

2.1 GDP at Factor Cost	4.6	8.1	4.2	1.9	4.6	5.0	3.8
2.2 Agriculture	3.0	3.3	4.8	-0.3	3.1	3.7	2.2
2.3 Mining	9.7	8.0	2.2	4.2	6.4	8.7	6.4
2.4 Manufacturing	5.3	9.2	2.0	1.2	4.6	5.2	3.7
2.5 Construction	1.3	23.5	7.5	5.3	7.8	11.4	8.2
2.6 Electricity, Gas and Water	5.0	7.4	5.7	5.1	5.7	6.1	5.6
2.7 Commerce, Restaurants and Hotels	6.4	10.4	4.3	1.5	4.9	5.5	4.0
2.8 Transport, Storage, Communications	7.0	6.8	5.4	2.3	5.3	6.1	4.6
2.9 Banking and Housing	7.2	7.6	5.1	4.1	3.7	3.7	3.8
2.10 Government and Other Services	0.1	2.9	5.0	-0.2	4.0	2.3	2.0

(Percentages of GDP)

2.11 GDP at Factor Cost	100	100	100	100	100	100	100
2.12 Agriculture	7.7	7.4	7.4	7.3	7.2	7.1	7.2
2.13 Mining	3.0	3.0	3.0	3.0	3.1	3.2	3.1
2.14 Manufacturing	25.0	25.3	24.7	24.6	24.5	24.6	24.6
2.15 Construction	5.6	6.4	6.6	6.8	7.0	7.5	7.1
2.16 Electricity, Gas and Water	2.4	2.3	2.4	2.5	2.5	2.5	2.5
2.17 Commerce, Restaurants and Hotels	16.2	16.5	16.5	16.5	16.5	16.6	16.5
2.18 Transport, Storage, Communications	5.5	5.4	5.5	5.5	5.5	5.6	5.5
2.19 Banking and Housing	16.8	16.7	16.8	17.2	17.1	16.8	17.0
2.20 Government and Other Services	17.8	16.9	17.0	16.7	16.6	16.2	16.5

Source: Ministry of Economy and Public Works and FIEL forecast

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Table 3 ARGENTINA Manufacturing Industry - GDP by Subsector

	1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates at Constant Prices)

3.1 GDP Manufacturing Industry	5.3	9.2	2.0	1.2	4.6	5.2	3.7
3.2 Food Products, Beverages and Tobacco	1.9	2.0	2.7	1.5	3.1	3.3	2.6
3.3 Textiles, Clothing and Leather Products	8.5	1.1	-3.3	-3.1	1.9	1.9	0.2
3.4 Wood Products and Furniture	12.5	4.5	4.5	1.4	3.6	4.2	3.1
3.5 Paper and Printing	7.3	4.5	2.1	2.7	6.2	6.5	5.1
3.6 Chemicals, Petroleum, Rubber, Plastic	2.7	3.3	2.1	3.3	6.0	1.9	3.7
3.7 Nonmetallic Minerals	6.3	17.0	5.9	0.6	7.3	10.5	6.1
3.8 Iron, Steel and Nonferrous Metal	12.5	6.9	3.1	-1.7	7.0	9.3	4.9
3.9 Machinery, Transport and Equipment	8.0	29.7	2.2	1.0	4.3	9.5	4.9
3.10 Other Manufacturing Industries	5.3	9.0	3.1	1.0	4.4	3.9	3.1

(Percentages of GDP)

3.11 GDP Manufacturing Industry	25.0	25.3	24.7	24.6	24.5	24.6	24.6
3.12 Food Products, Beverages and Tobacco	6.1	5.7	5.7	5.6	5.6	5.5	5.6
3.13 Textiles, Clothing and Leather Products	2.7	2.5	2.3	2.2	2.2	2.1	2.2
3.14 Wood Products and Furniture	0.6	0.5	0.5	0.5	0.5	0.5	0.5
3.15 Paper and Printing	1.6	1.5	1.5	1.5	1.5	1.5	1.5
3.16 Chemicals, Petroleum, Rubber, Plastic	6.3	6.0	5.9	5.9	6.0	5.8	5.9
3.17 Nonmetallic Minerals	1.0	1.0	1.1	1.0	1.1	1.1	1.1
3.18 Iron, Steel and Nonferrous Metal	1.3	1.3	1.3	1.3	1.3	1.3	1.3
3.19 Machinery, Transport and Equipment	5.3	6.4	6.2	6.2	6.2	6.4	6.3
3.20 Other Manufacturing Industries	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source FIEL estimates and forecast

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Table 4 ARGENTINA Balance of Payments and External Debt

	1996	1997	1998	1999	2000	2001
<i>(Millions of US Dollars)</i>						
4.1 Current Account (4.2+4.9+4.13)	-3787	-9429	-11805	-14886	-16344	-20331
4.2 Resource Balance (4.3-4.6)	-873	-5586	-8219	-10359	-10969	-13824
4.3 Exports of Goods and NFS	27429	29829	29170	29915	34825	39383
4.4 Merchandise Exports (FOB)	23811	26025	25330	25865	30601	34956
4.5 Non Factor Services	3618	3804	3840	4050	4224	4427
4.6 Imports of Goods and NFS	28302	35415	37389	40274	45794	53207
4.7 Merchandise Imports (CIF)	23761	30355	32399	35142	40394	47487
4.8 Non Factor Services	4541	5060	4991	5132	5400	5720
4.9 Net Factor Service Income	-3248	-4190	-4271	-5187	-5988	-7074
4.10 Interest Perceived on External Assets	4587	5384	5447	5012	5311	6094
4.11 Interest Accrued on External Debt	-5913	-7139	-7127	-7366	-8230	-9789
4.12 Royalties and Dividends	-1922	-2435	-2591	-2833	-3069	-3379
4.13 Current Transfers	334	347	685	660	613	567
4.14 Balance on Capital Account	7569	12491	13871	16703	18898	22895
4.15 Public	9580	6530	10580	12296	11228	14103
4.16 Private	-2011	5961	3290	4407	7670	8792
4.17 Net International Reserves (change)	3782	3062	2066	1817	2554	2564
4.18 Liquid External Assets of Central Bank (end of year)	19745	22807	24873	26690	29244	31808
4.19 External Debt	99468	110171	122903	139263	157453	179086
4.20 Public	73612	74775	84155	96451	108679	123981
4.22 Private	25856	35396	38748	42812	48774	55104
4.23 External Debt/Total Exports	3.63	3.69	4.21	4.66	4.52	4.55

(Annual Growth Rates, %)

**Average
1999/2001**

4.24 Exports of Goods and NFS	13.3	8.8	-2.2	2.6	16.4	13.1	10.7
4.25 Merchandise Exports (FOB)	13.6	9.3	-2.7	2.1	18.3	14.2	11.6
4.26 Non Factor Services	11.7	5.2	0.9	5.5	4.3	4.8	4.9
4.27 Imports of Goods and NFS	17.0	25.1	5.6	7.7	13.7	16.2	12.5
4.28 Merchandise Imports (CIF)	18.1	27.8	6.7	8.5	14.9	17.6	13.7
4.29 Non Factor Services	11.7	11.4	-1.4	2.8	5.2	5.9	4.7
4.30 Net Factor Service Income	1.0	29.0	1.9	21.4	15.4	18.1	18.3

Source: Ministry of Economy and Public Works, adjusted as from 1993, and FIEL forecast

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Table 5 ARGENTINA Population, Employment and Capacity Utilization

1996	1997	1998	1999	2000	2001
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(Thousands, % rates and index numbers)

5.1 Population (Mid-year)	35220	35672	36125	36578	37032	37487
5.2 Active Population	13983	14366	14458	14736	14999	15290
5.3 Activity rate (%)	39.7	40.3	40.0	40.3	40.5	40.8
5.4 Employment	11575	12226	12593	12693	12997	13287
5.5 Workers	8582	9083	9358	9408	9602	9815
5.6 Non Workers	2993	3143	3235	3286	3395	3473
5.7 Unemployment Rate - Total (%)	17.2	14.9	12.9	13.9	13.3	13.1
5.8 Hours per worker - industry (1986=100)	102.6	104.4	101.3	101.3	102.2	103.2
5.9 Capacity Utilization - industry (%)	75.6	76.9	74.5	72.8	76.2	76.7

(Annual Growth Rates, %)

**Average
1999/2001**

5.10 Population	1.3	1.3	1.3	1.3	1.2	1.2	1.2
5.11 Active Population	0.7	2.7	0.6	1.9	1.8	1.9	1.9
5.12 Employment	0.9	5.6	3.0	0.8	2.4	2.2	1.8
5.13 Workers	2.6	5.8	3.0	0.5	2.1	2.2	1.6
5.14 Non Workers	-3.8	5.0	2.9	1.6	3.3	2.3	2.4

*Source: INDEC (5.1 and 5.7) and FIEL estimates based on INDEC, and forecast.
Unemployment Rate is an annual average and does not include "underemployment"*

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Table 6 ARGENTINA Gross Fixed Investment

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates At Constant Prices, %)</i>						Average 1999/2001
6.1 Gross Fixed Investment	8.8	26.5	8.1	7.4	8.9	10.5	8.9
6.2 Construction	1.6	22.4	7.5	5.2	7.7	11.2	8.1
6.3 Public	-2.6	22.4	2.0	0.0	6.5	5.0	3.8
6.4 Private	2.0	22.4	8.0	5.7	7.8	11.8	8.5
6.5 Machinery, Tools and Transport Equipment	17.1	30.6	8.6	9.4	9.9	9.9	9.7
6.6 Investment-Output Ratio at constant prices	0.207	0.241	0.250	0.263	0.274	0.288	0.275

(Billions of US dollars)

6.7 Gross Fixed Investment	49.1	60.8	64.4	68.6	75.8	85.9
6.8 Construction	30.9	37.2	39.8	41.9	46.4	53.4
6.9 Public	2.9	3.6	3.6	3.6	3.9	4.3
6.10 Private	27.9	33.7	36.2	38.3	42.4	49.1
6.11 Machinery, Tools and Transport Equipment	18.2	23.5	24.6	26.7	29.4	32.5

Source: Ministry of Economy and Public Works and FIEL estimates (6.3/6.4) and forecast

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Table 7 ARGENTINA Consumption and Saving

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates At Constant Prices, %)</i>						Average 1999/2001
7.1 Consumption plus Change in Inventories	6.1	7.8	4.2	1.8	4.8	5.3	3.9
7.2 Public	-1.4	-1.2	-0.4	0.0	0.5	1.0	0.5
7.3 Private	7.1	8.8	4.7	1.9	5.2	5.7	4.3
7.4 Durable Goods	13.1	10.2	10.7	3.3	8.4	10.0	7.2
7.5 Non-Durable and Services	6.8	8.8	4.3	1.9	5.0	5.4	4.1
7.6 GDP Per Capita	3.4	7.2	3.0	0.6	3.4	3.8	2.6
7.7 Total Consumption Per Capita	4.8	6.4	2.9	0.5	3.5	4.0	2.6
	<i>(Percentage of GDP, current prices)</i>						
7.8 Saving Rate	16.3	18.6	19.1	20.0	20.4	21.3	20.6
7.9 Domestic Saving Rate	15.1	15.7	15.6	15.7	16.0	16.3	16.0
7.10 External Saving Rate	1.3	2.9	3.5	4.3	4.4	5.0	4.6
	<i>(Percentage of GDP, constant prices)</i>						
7.11 Consumption plus Ch. Inventories	83.7	83.0	82.9	82.8	82.9	83.0	82.9
7.12 Public	9.0	8.1	7.8	7.6	7.3	7.1	7.3
7.13 Private	74.7	74.9	75.1	75.2	75.5	76.0	75.6

Source: Ministry of Economy and Public Works and FIEL estimates (based on INDEC) and forecast

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Table 8 ARGENTINA Productivity, Employment by Sectoral Origin and Labor Income

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates, %)</i>						Average 1999/2001
8.1 Average Productivity by Person	1.9	2.2	1.2	1.4	2.5	2.7	2.2
8.2 Average Productivity by Hour Worked	-1.1	0.4	4.3	1.4	1.5	1.8	1.6
8.3 Total Employment (Workers)	2.6	5.8	3.0	0.5	2.1	2.2	1.6
8.4 Agriculture	-1.0	-1.2	0.3	-0.5	-0.5	-0.5	-0.5
8.5 Mining	-0.8	2.0	4.2	0.3	0.9	2.5	1.2
8.6 Manufacturing	-4.0	4.1	4.6	-1.9	0.3	0.8	-0.3
8.7 Construction	-0.4	18.7	7.1	-1.3	7.3	10.4	5.5
8.8 Electricity, Gas and Water	2.8	-1.6	0.9	1.6	1.2	1.5	1.4
8.9 Commerce, Restaurants and Hotels	0.6	4.0	5.8	2.1	2.7	1.5	2.1
8.10 Transport, Storage, Communications	2.4	3.9	0.7	0.1	1.4	1.1	0.9
8.11 Banking and Housing	-2.2	8.5	1.3	0.9	0.9	0.5	0.8
8.12 Government and Other Services	7.4	7.1	2.0	1.0	2.3	2.6	2.0
9.13 Non-Government	15.2	13.2	3.6	1.6	3.5	3.5	2.9
8.14 Government	-1.4	-1.2	-0.4	0.0	0.5	1.0	0.5
8.15 Average Labor Income (Real)	0.9	0.1	-1.5	-1.5	-0.6	0.8	-0.5
8.16 Average Labor Cost (US\$)	-3.6	-1.4	-1.1	-0.6	1.3	4.5	1.7
8.16 Average Hourly Income (Real)	-2.0	-1.6	1.6	-1.5	-1.6	-0.2	-1.1

Source: FIEL estimates and forecast

Deflator: Consumer Price Index. Labor Cost: Average Wage in US\$ adjusted by labor taxes (FIEL estimate)

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Table 9 ARGENTINA and Regional Exchange Rates Indices

1996	1997	1998	1999	2000	2001
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(\$/US\$, \$/SDR and Index Numbers 1986=100)

9.1 Argentina Exch Rate \$/US\$	1.00	1.00	1.00	1.00	1.00	1.00
9.2 Argentina Exch Rate \$/SDR	1.45	1.38	1.35	1.38	1.40	1.43
9.3 Argentina Index of Real Exch Rate \$/US\$	57.4	57.2	56.5	57.2	56.1	55.3
9.4 Brazil Index of Real Exchange Rate	53.7	53.6	55.7	58.4	58.4	57.2
9.5 Chile Index of Real Exchange Rate	65.8	64.0	67.9	69.1	68.7	67.7

(Annual Growth Rates, %)

**Average
1999/2001**

9.6 Argentina Exch Rate \$/US\$	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.7 Argentina Exch Rate \$/SDR	-4.3	-5.2	-2.0	2.1	2.0	1.5	1.9
9.6 Argentina Real Exch Rate \$/US\$	0.7	-0.4	-1.2	1.1	-1.8	-1.4	-0.7
9.9 Brazil Real Exchange Rate	-4.3	-0.2	3.9	4.8	0.0	-2.0	0.9
9.10 Chile Real Exchange Rate	2.8	-2.7	6.0	1.8	-0.5	-1.5	-0.1

Source: FIEL estimates and forecast. Real Exchange Rate: Purchasing Power Parity \$/US\$, using US Producer Price Index (Total) and each country implicit deflator of GDP. SDR = Special Drawing Rights

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Table 10 ARGENTINA Terms of Trade

1996	1997	1998	1999	2000	2001
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(Index Number 1986=100)

10.1 Terms of Trade	131.6	130.1	122.2	123.6	130.9	132.2
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(Annual Growth Rates, %)

**Average
1999/2001**

10.2 Unit Value of World Exports	-0.8	-7.7	-6.0	1.5	3.8	3.0	2.8
10.3 Unit Value of Argentina Exports	6.2	-3.0	-11.3	2.3	7.9	2.5	4.2
10.4 Merchandises	6.7	-3.5	-12.4	2.4	9.1	2.7	4.7
10.5 Primary and Agrobased Products	11.5	-4.5	-14.0	2.6	13.4	3.0	6.3
10.6 Manufacturing	-5.2	-0.9	-1.5	1.5	2.4	2.2	2.0
10.7 Energy	22.0	-6.0	-35.6	3.9	9.0	6.8	6.6
10.8 Non Factor Services	2.1	1.0	-2.2	0.8	1.6	1.7	1.4
10.9 Unit Value of Argentina Imports	-1.0	-1.9	-5.6	1.2	1.9	1.4	1.5
10.10 Merchandises	-1.2	-1.7	-5.4	1.4	2.2	1.7	1.8
10.11 Capital Goods	-4.4	-2.1	-5.1	1.6	0.4	-0.4	0.5
10.12 Intermediate Goods	-3.6	-2.4	-4.2	0.9	2.4	1.9	1.7
10.13 Consumption Goods	2.9	1.4	-4.4	1.7	3.3	3.0	2.7
10.14 Energy	32.2	-2.0	-35.0	4.5	9.0	7.0	6.8
10.15 Non Factor Services	2.0	0.6	-4.5	1.0	2.0	2.0	1.7
10.16 Terms of Trade	7.2	-1.1	-6.1	1.1	5.9	1.0	2.7

Source: FIEL estimates based on INDEC, and FIEL forecast

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Table 11 ARGENTINA Trade

1996	1997	1998	1999	2000	2001
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(Quantity Indexes, Annual Growth Rates, %)

Average 1999/2001

	1996	1997	1998	1999	2000	2001	Average 1999/2001
<i>Factors affecting Trade</i>							
11.1 World GDP	2.9	3.2	1.6	2.0	2.7	2.8	2.5
11.2 GDP US	3.4	3.9	3.6	1.8	2.1	2.1	2.0
11.3 Regional GDP: Brazil	2.9	2.9	0.4	-2.4	4.7	5.1	2.5
11.4 Regional GDP: Chile	7.4	7.1	4.2	3.5	4.8	6.1	4.8
<i>Trade Growth</i>							
11.5 Exports	6.7	12.1	10.3	0.2	7.9	10.3	6.2
11.6 Merchandises	6.4	13.2	11.1	-0.2	8.5	11.2	6.5
11.7 Primary and Agrobased Products	8.5	8.1	17.6	-3.1	9.2	11.3	5.8
11.8 Manufacturing	-2.7	28.7	3.6	4.4	6.0	8.6	6.3
11.9 Energy	16.6	5.5	3.2	1.8	11.1	15.9	9.6
11.10 Non Factor Services	9.4	4.2	3.2	4.6	2.6	3.1	3.4
11.11 Imports	18.2	27.6	11.8	6.5	11.6	14.6	10.9
11.12 Merchandises	19.5	30.0	12.8	7.0	12.5	15.6	11.7
11.13 Capital Goods	23.6	40.5	9.7	8.2	11.3	14.0	11.2
11.14 Intermediate Goods	22.4	28.4	12.7	6.5	14.9	17.2	12.9
11.15 Consumption Goods	17.8	25.5	15.2	7.4	8.6	14.7	10.2
11.16 Energy	-21.1	3.9	28.4	1.8	4.9	6.2	4.3
11.17 Non Factor Services	9.6	10.8	3.2	1.8	3.1	3.9	2.9
11.18 Index of openness	18.6	19.9	19.7	20.5	21.7	23.0	21.7

*Source: International: IMF, INDEC, FIEL estimate and forecast
Index 11.18 is defined as (Exports+Imports)/GDP at current prices*

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Table 12 ARGENTINA Prices

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Average Growth Rates, %)</i>						Average 1999/2001
12.1 GDP Deflator	1.7	0.3	-1.0	-0.3	3.5	3.2	2.1
12.2 General Wholesale Price Index	3.2	0.1	-3.1	-1.0	3.6	3.3	2.0
12.3 Consumer Price Index	0.2	0.5	0.9	0.4	3.4	3.0	2.3
12.4 Goods	0.0	-0.3	0.7	0.4	3.4	4.4	2.7
12.5 Services	0.4	1.6	1.3	0.3	3.4	1.3	1.7
12.6 Construction Price Index	-4.3	-1.5	0.0	-0.2	2.0	3.7	1.8

*Source: 12.1: as estimated by the Ministry of Economy and Public Works. FIEL forecast based on the same methodology
12.2/12.6 INDEC and FIEL forecast*

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Table 13 ARGENTINA and World Financial Indicators

	1996	1997	1998	1999	2000	2001	
<i>(Stocks in Millions of US Dollars)</i>							
13.1 Total Domestic Deposits (End of Year)	53066	68172	76444	83897	94645	105739	
13.2 Total Domestic Deposits (Annual Average)	50219	62786	74048	82188	92257	103530	
13.3 Loans to Private Sector (Annual Average)	51179	57780	64587	70782	79453	89162	
							Average 1999/2001
<i>(Annual Growth Rates, %)</i>							
13.4 Total Domestic Deposits (End of Year)	22.6	28.5	12.1	9.7	12.8	11.7	11.4
13.5 Total Domestic Deposits (Annual Average)	20.1	25.0	17.9	11.0	12.3	12.2	11.8
13.6 Loans to Private Sector (Annual Average)	2.9	12.9	11.8	9.6	12.3	12.2	11.4
							Average 1999/2001
<i>Argentina Interest Rates (Annual Averages in Percentage)</i>							
13.7 Deposit Rate in Pesos 30 days, Nominal	6.8	6.2	6.2	5.2	5.3	6.0	5.5
13.8 Deposit Rate in Pesos, Real	5.0	5.9	7.3	5.5	1.7	2.8	3.3
13.9 Country Risk (Spread - Avge. Life 2 Year)	4.5	3.0	6.1	5.8	5.0	4.3	5.0
<i>International (Annual Growth Rates, % and Annual Averages)</i>							
13.10 US Producer Price Index (Total)	2.3	-0.1	-2.2	0.8	1.6	1.7	1.4
13.11 US Consumer Price Index (All Urban)	2.9	2.3	1.6	2.4	2.7	2.8	2.6
13.12 Oil Prices (WTI)	20.1	-6.5	-35.0	4.5	9.0	7.0	6.8
13.13 LIBOR 180	5.6	5.9	5.6	4.8	4.8	5.2	4.9
13.14 US Treasury 10 Years	6.4	6.4	5.3	4.9	5.1	5.2	5.1

Source: 13.1/13.7: Central Bank and FIEL estimates and forecast. Deposit rate deflator: implicit GDP deflator.
13.9 estimate based on yield over LIBOR. 13.10/13.14: IMF, and FIEL forecast

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TABLES

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Table 1 ARGENTINA Gross Domestic Product, Global Supply and Demand

	1996	1997	1998	1999	2000	2001	Average 1999/2001
<i>(Annual Growth Rates At Constant Prices, %)</i>							
1.1 GDP at market prices	4.8	8.6	4.4	-2.1	4.1	5.4	2.5
1.2 Imports of Goods and NFS	18.2	27.6	11.8	-6.6	8.9	15.6	6.0
1.3 Consumption and Change in Inventories	6.1	7.8	4.2	-2.8	4.4	5.9	2.5
1.4 Gross Domestic Fixed Investment	8.8	26.5	8.1	-3.4	7.4	10.2	4.7
1.5 Exports of Goods and NFS	6.7	12.1	10.3	-3.2	4.3	10.5	3.9
1.6 Global Supply and Demand	6.7	11.6	5.7	-2.9	5.0	7.3	3.1

(Billions of US dollars)

1.7 GDP at market prices	300.3	327.1	338.0	321.7	341.4	369.0
1.8 Imports of Goods and NFS	28.3	35.4	37.4	34.9	38.5	45.2
1.9 Consumption and Change in Inventories	252.1	272.0	281.7	268.3	283.8	305.9
1.10 Gross Domestic Fixed Investment	49.1	60.8	64.4	60.7	66.1	73.3
1.11 Exports of Goods and NFS	27.4	29.8	29.2	27.5	30.1	35.1
1.12 Global Supply and Demand	328.6	362.6	375.3	356.6	379.9	414.3

Source: Ministry of Economy and Public Works and FIEL estimates and forecast

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Table 2 ARGENTINA Gross Domestic Product at Factor Cost by Sectoral Origin

	1996	1997	1998	1999	2000	2001	Average 1999/2001
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(Annual Growth Rates at Constant Prices)

2.1 GDP at Factor Cost	4.6	8.1	4.2	-1.9	4.1	5.3	2.5
2.2 Agriculture	3.0	3.3	4.8	-1.8	2.2	3.8	1.4
2.3 Mining	9.7	8.0	2.2	2.5	4.5	8.4	5.1
2.4 Manufacturing	5.3	9.2	2.0	-5.8	3.9	5.7	1.2
2.5 Construction	1.3	23.5	7.5	-2.9	7.3	10.3	4.9
2.6 Electricity, Gas and Water	5.0	7.4	5.7	3.1	4.5	5.4	4.4
2.7 Commerce, Restaurants and Hotels	6.4	10.4	4.3	-3.8	4.5	6.2	2.3
2.8 Transport, Storage, Communications	7.0	6.8	5.4	-1.9	4.5	6.7	3.1
2.9 Banking and Housing	7.2	7.6	5.1	1.5	3.1	3.7	2.8
2.10 Government and Other Services	0.1	2.9	5.0	1.0	4.5	3.2	2.9

(Percentages of GDP)

2.11 GDP at Factor Cost	100	100	100	100	100	100	100
2.12 Agriculture	7.7	7.4	7.4	7.4	7.3	7.2	7.3
2.13 Mining	3.0	3.0	3.0	3.1	3.1	3.2	3.1
2.14 Manufacturing	25.0	25.3	24.7	23.7	23.7	23.8	23.7
2.15 Construction	5.6	6.4	6.6	6.5	6.7	7.1	6.8
2.16 Electricity, Gas and Water	2.4	2.3	2.4	2.5	2.5	2.5	2.5
2.17 Commerce, Restaurants and Hotels	16.2	16.5	16.5	16.2	16.3	16.4	16.3
2.18 Transport, Storage, Communications	5.5	5.4	5.5	5.5	5.5	5.6	5.5
2.19 Banking and Housing	16.8	16.7	16.8	17.4	17.3	17.0	17.2
2.20 Government and Other Services	17.8	16.9	17.0	17.5	17.6	17.3	17.5

Source: Ministry of Economy and Public Works and FIEL forecast

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Table 3 ARGENTINA Manufacturing Industry - GDP by Subsector

	1996	1997	1998	1999	2000	2001	Average 1999/2001
<i>(Annual Growth Rates at Constant Prices)</i>							
3.1 GDP Manufacturing Industry	5.3	9.2	2.0	-5.8	3.9	5.7	1.2
3.2 Food Products, Beverages and Tobacco	1.9	2.0	2.7	-0.7	2.9	3.6	1.9
3.3 Textiles, Clothing and Leather Products	8.5	1.1	-3.3	-7.0	7.0	4.9	1.6
3.4 Wood Products and Furniture	12.5	4.5	4.5	-3.2	2.6	4.8	1.4
3.5 Paper and Printing	7.3	4.5	2.1	-3.1	5.9	7.6	3.5
3.6 Chemicals, Petroleum, Rubber, Plastic	2.7	3.3	2.1	-0.6	4.0	2.5	2.0
3.7 Nonmetallic Minerals	6.3	17.0	5.9	-6.6	6.7	9.5	3.2
3.8 Iron, Steel and Nonferrous Metal	12.5	6.9	3.1	-10.1	5.3	10.5	1.9
3.9 Machinery, Transport and Equipment	8.0	29.7	2.2	-14.7	2.1	9.4	-1.1
3.10 Other Manufacturing Industries	5.3	9.0	3.1	-2.4	5.0	5.7	2.7

(Percentages of GDP)

3.11 GDP Manufacturing Industry	25.0	25.3	24.7	23.7	23.7	23.8	23.7
3.12 Food Products, Beverages and Tobacco	6.1	5.7	5.7	5.7	5.7	5.6	5.7
3.13 Textiles, Clothing and Leather Products	2.7	2.5	2.3	2.2	2.3	2.3	2.3
3.14 Wood Products and Furniture	0.6	0.5	0.5	0.5	0.5	0.5	0.5
3.15 Paper and Printing	1.6	1.5	1.5	1.5	1.5	1.5	1.5
3.16 Chemicals, Petroleum, Rubber, Plastic	6.3	6.0	5.9	5.9	5.9	5.8	5.9
3.17 Nonmetallic Minerals	1.0	1.0	1.1	1.0	1.0	1.1	1.0
3.18 Iron, Steel and Nonferrous Metal	1.3	1.3	1.3	1.2	1.2	1.3	1.2
3.19 Machinery, Transport and Equipment	5.3	6.4	6.2	5.4	5.3	5.5	5.4
3.20 Other Manufacturing Industries	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source FIEL estimates and forecast

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Table 4 ARGENTINA Balance of Payments and External Debt

	1996	1997	1998	1999	2000	2001
<i>(Millions of US Dollars)</i>						
4.1 Current Account (4.2+4.9+4.13)	-3787	-9429	-11805	-11480	-13668	-16058
4.2 Resource Balance (4.3-4.6)	-873	-5586	-8219	-7333	-8424	-10135
4.3 Exports of Goods and NFS	27429	29829	29170	27519	30094	35107
4.4 Merchandise Exports (FOB)	23811	26025	25330	23568	26022	30826
4.5 Non Factor Services	3618	3804	3840	3951	4072	4281
4.6 Imports of Goods and NFS	28302	35415	37389	34852	38518	45242
4.7 Merchandise Imports (CIF)	23761	30355	32399	30026	33518	39927
4.8 Non Factor Services	4541	5060	4991	4826	5001	5315
4.9 Net Factor Service Income	-3248	-4190	-4271	-5010	-5925	-6468
4.10 Interest Perceived on External Assets	4587	5384	5447	4177	4533	5308
4.11 Interest Accrued on External Debt	-5913	-7139	-7127	-6427	-7410	-8597
4.12 Royalties and Dividends	-1922	-2435	-2591	-2759	-3047	-3179
4.13 Current Transfers	334	347	685	863	681	545
4.14 Balance on Capital Account	7569	12491	13871	10491	15352	18468
4.15 Public	9580	6530	10580	12624	9666	10984
4.16 Private	-2011	5961	3290	-2133	5686	7483
4.17 Net International Reserves (change)	3782	3062	2066	-989	1684	2410
4.18 Liquid External Assets of Central Bank (end of year)	19745	22807	24873	23884	25568	27977
4.19 External Debt	99468	110171	122904	133878	148501	166167
4.20 Public	73612	74775	84155	96779	107446	119630
4.22 Private	25856	35396	38748	37099	41056	46537
4.23 External Debt/Total Exports	3.63	3.69	4.21	4.86	4.93	4.73

(Annual Growth Rates, %)

Average
1999/2001

4.24 Exports of Goods and NFS	13.3	8.8	-2.2	-5.7	9.4	16.7	6.8
4.25 Merchandise Exports (FOB)	13.6	9.3	-2.7	-7.0	10.4	18.5	7.3
4.26 Non Factor Services	11.7	5.2	0.9	2.9	3.1	5.1	3.7
4.27 Imports of Goods and NFS	17.0	25.1	5.6	-6.8	10.5	17.5	7.1
4.28 Merchandise Imports (CIF)	18.1	27.8	6.7	-7.3	11.6	19.1	7.8
4.29 Non Factor Services	11.7	11.4	-1.4	-3.3	3.6	6.3	2.2
4.30 Net Factor Service Income	1.0	29.0	1.9	17.3	18.3	9.2	14.9

Source: Ministry of Economy and Public Works, adjusted as from 1993, and FIEL forecast

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Table 5 ARGENTINA Population, Employment and Capacity Utilization

1996	1997	1998	1999	2000	2001
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(Thousands, % rates and index numbers)

5.1 Population (Mid-year)	35220	35672	36125	36578	37032	37487
5.2 Active Population	13983	14366	14458	14666	14927	15207
5.3 Activity rate (%)	39.7	40.3	40.0	40.1	40.3	40.6
5.4 Employment	11575	12226	12593	12445	12698	13049
5.5 Workers	8582	9083	9358	9232	9391	9642
5.6 Non Workers	2993	3143	3235	3213	3307	3406
5.7 Unemployment Rate - Total (%)	17.2	14.9	12.9	15.1	14.9	14.2
5.8 Hours per worker - industry (1986=100)	102.6	104.4	101.3	101.3	101.7	101.7
5.9 Capacity Utilization - industry (%)	75.6	76.9	74.5	71.0	73.5	74.7

(Annual Growth Rates, %)

**Average
1999/2001**

5.10 Population	1.3	1.3	1.3	1.3	1.2	1.2	1.2
5.11 Active Population	0.7	2.7	0.6	1.4	1.8	1.9	1.7
5.12 Employment	0.9	5.6	3.0	-1.2	2.0	2.8	1.2
5.13 Workers	2.6	5.8	3.0	-1.4	1.7	2.7	1.0
5.14 Non Workers	-3.8	5.0	2.9	-0.7	2.9	3.0	1.8

Source: INDEC (5.1 and 5.7) and FIEL estimates based on INDEC, and forecast.

Unemployment Rate is an annual average and does not include "underemployment"

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Table 6 ARGENTINA Gross Fixed Investment

	1996	1997	1998	1999	2000	2001	Average 1999/2001
	<i>(Annual Growth Rates At Constant Prices, %)</i>						
6.1 Gross Fixed Investment	8.8	26.5	8.1	-3.4	7.4	10.2	4.7
6.2 Construction	1.6	22.4	7.5	-2.8	7.1	10.1	4.8
6.3 Public	-2.6	22.4	2.0	-10.0	8.0	9.0	2.3
6.4 Private	2.0	22.4	8.0	-2.1	7.0	10.2	5.0
6.5 Machinery, Tools and Transport Equipment	17.1	30.6	8.6	-3.8	7.6	10.2	4.7
6.6 Investment-Output Ratio at constant prices	0.207	0.241	0.250	0.247	0.254	0.266	0.256

(Billions of US dollars)

6.7 Gross Fixed Investment	49.1	60.8	64.4	60.7	66.1	73.3
6.8 Construction	30.9	37.2	39.8	37.6	41.2	45.9
6.9 Public	2.9	3.6	3.6	3.2	3.5	3.8
6.10 Private	27.9	33.7	36.2	34.5	37.7	42.1
6.11 Machinery, Tools and Transport Equipment	18.2	23.5	24.6	23.1	24.9	27.4

Source: Ministry of Economy and Public Works and FIEL estimates (6.3/6.4) and forecast

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Table 7 ARGENTINA Consumption and Saving

	1996	1997	1998	1999	2000	2001	Average 1999/2001
	<i>(Annual Growth Rates At Constant Prices, %)</i>						
7.1 Consumption plus Change in Inventories	6.1	7.8	4.2	-2.8	4.4	5.9	2.5
7.2 Public	-1.4	-1.2	-0.4	-0.5	1.0	1.0	0.5
7.3 Private	7.1	8.8	4.7	-3.0	4.8	6.3	2.7
7.4 Durable Goods	13.1	10.2	10.7	-7.2	6.2	11.3	3.5
7.5 Non-Durable and Services	6.8	8.8	4.3	-2.8	4.7	6.1	2.7
7.6 GDP Per Capita	3.4	7.2	3.0	-3.3	2.8	4.1	1.2
7.7 Total Consumption Per Capita	4.8	6.4	2.9	-4.0	3.1	4.6	1.2

(Percentage of GDP, current prices)

7.8 Saving Rate	16.3	18.6	19.1	18.9	19.4	19.9	19.4
7.9 Domestic Saving Rate	15.1	15.7	15.6	15.3	15.4	15.5	15.4
7.10 External Saving Rate	1.3	2.9	3.5	3.6	4.0	4.4	4.0

(Percentage of GDP, constant prices)

7.11 Consumption plus Ch. Inventories	83.7	83.0	82.9	82.3	82.5	82.9	82.6
7.12 Public	9.0	8.1	7.8	7.9	7.7	7.3	7.6
7.13 Private	74.7	74.9	75.1	74.4	74.8	75.5	74.9

Source: Ministry of Economy and Public Works and FIEL estimates (based on INDEC) and forecast

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Table 8 ARGENTINA Productivity, Employment by Sectoral Origin and Labor Income

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Growth Rates, %)</i>						Average 1999/2001
8.1 Average Productivity by Person	1.9	2.2	1.2	-0.6	2.4	2.5	1.4
8.2 Average Productivity by Hour Worked	-1.1	0.4	4.3	-0.6	1.9	2.5	1.3
8.3 Total Employment (Workers)	2.6	5.8	3.0	-1.4	1.7	2.7	1.0
8.4 Agriculture	-1.0	-1.2	0.3	-0.5	-0.5	-0.5	-0.5
8.5 Mining	-0.8	2.0	4.2	1.7	-1.6	2.1	0.7
8.6 Manufacturing	-4.0	4.1	4.6	-7.1	-1.0	1.8	-2.1
8.7 Construction	-0.4	18.7	7.1	-6.9	2.2	12.7	2.7
8.8 Electricity, Gas and Water	2.8	-1.6	0.9	1.2	1.2	1.3	1.2
8.9 Commerce, Restaurants and Hotels	0.6	4.0	5.8	1.1	1.9	2.4	1.8
8.10 Transport, Storage, Communications	2.4	3.9	0.7	-1.4	1.2	1.9	0.6
8.11 Banking and Housing	-2.2	8.5	1.3	0.5	0.8	0.9	0.7
8.12 Government and Other Services	7.4	7.1	2.0	-0.2	2.9	2.6	1.8
9.13 Non-Government	15.2	13.2	3.6	-0.1	4.1	3.6	2.6
8.14 Government	-1.4	-1.2	-0.4	-0.5	1.0	1.0	0.5
8.15 Average Labor Income (Real)	0.9	0.1	-1.5	-3.1	-1.9	1.0	-1.3
8.16 Average Labor Cost (US\$)	-3.6	-1.4	-1.1	-3.1	1.3	0.6	-0.4
8.16 Average Hourly Income (Real)	-2.0	-1.6	1.6	-3.1	-2.4	1.0	-1.5

Source: FIEL estimates and forecast

Deflator: Consumer Price Index. Labor Cost: Average Wage in US\$ adjusted by labor taxes (FIEL estimate)

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Table 9 ARGENTINA and Regional Exchange Rates Indices

	1996	1997	1998	1999	2000	2001
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(\$/US\$, \$/SDR and Index Numbers 1986=100)

9.1 Argentina Exch Rate \$/US\$	1.00	1.00	1.00	1.00	1.00	1.00
9.2 Argentina Exch Rate \$/SDR	1.45	1.38	1.35	1.37	1.39	1.42
9.3 Argentina Index of Real Exch Rate \$/US\$	57.4	57.2	56.5	57.3	56.6	56.1
9.4 Brazil Index of Real Exchange Rate	53.7	53.6	55.7	59.9	61.1	59.8
9.5 Chile Index of Real Exchange Rate	65.8	64.0	67.9	70.9	71.6	69.8

(Annual Growth Rates, %)

**Average
1999/2001**

9.6 Argentina Exch Rate \$/US\$	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.7 Argentina Exch Rate \$/SDR	-4.3	-5.2	-2.0	1.5	1.5	2.0	1.7
9.6 Argentina Real Exch Rate \$/US\$	0.7	-0.4	-1.2	1.3	-1.1	-0.8	-0.2
9.9 Brazil Real Exchange Rate	-4.3	-0.2	3.9	7.5	2.0	-2.0	2.5
9.10 Chile Real Exchange Rate	2.8	-2.7	6.0	4.5	1.0	-2.5	1.0

Source: FIEL estimates and forecast. Real Exchange Rate: Purchasing Power Parity \$/US\$, using US Producer Price Index (Total) and each country implicit deflator of GDP. SDR = Special Drawing Rights

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Table 10 ARGENTINA Terms of Trade

1996	1997	1998	1999	2000	2001
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(Index Number 1986=100)

10.1 Terms of Trade	131.6	130.1	122.2	119.3	123.2	128.0
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(Annual Growth Rates, %)

Average 1999/2001

10.2 Unit Value of World Exports	-0.8	-7.7	-6.0	-0.5	2.5	3.5	1.8
10.3 Unit Value of Argentina Exports	6.2	-3.0	-11.3	-2.6	4.8	5.6	2.6
10.4 Merchandises	6.7	-3.5	-12.4	-3.1	5.6	6.4	3.0
10.5 Primary and Agrobased Products	11.5	-4.5	-14.0	-4.1	8.9	8.7	4.5
10.6 Manufacturing	-5.2	-0.9	-1.5	-3.3	0.3	3.1	0.1
10.7 Energy	22.0	-6.0	-35.6	0.2	6.6	7.3	4.7
10.8 Non Factor Services	2.1	1.0	-2.2	-1.5	0.8	1.7	0.3
10.9 Unit Value of Argentina Imports	-1.0	-1.9	-5.6	-0.2	1.5	1.6	1.0
10.10 Merchandises	-1.2	-1.7	-5.4	-0.2	1.8	2.0	1.2
10.11 Capital Goods	-4.4	-2.1	-5.1	-1.2	1.4	0.6	0.2
10.12 Intermediate Goods	-3.6	-2.4	-4.2	-0.3	1.6	2.2	1.1
10.13 Consumption Goods	2.9	1.4	-4.4	1.1	3.0	3.2	2.4
10.14 Energy	32.2	-2.0	-35.0	0.0	7.0	8.0	5.0
10.15 Non Factor Services	2.0	0.6	-4.5	-1.4	1.1	2.0	0.6
10.16 Terms of Trade	7.2	-1.1	-6.1	-2.4	3.3	3.9	1.6

Source: FIEL estimates based on INDEC, and FIEL forecast

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Table 11 ARGENTINA Trade

	1996	1997	1998	1999	2000	2001	Average 1999/2001
<i>(Quantity Indexes, Annual Growth Rates, %)</i>							
<i>Factors affecting Trade</i>							
11.1 World GDP	2.9	3.2	1.6	1.6	1.8	2.7	2.0
11.2 GDP US	3.4	3.9	3.6	1.0	1.4	2.6	1.7
11.3 Regional GDP: Brazil	2.9	2.9	0.4	-4.0	3.5	5.7	1.7
11.4 Regional GDP: Chile	7.4	7.1	4.2	1.5	4.5	6.3	4.1
<i>Trade Growth</i>							
11.5 Exports	6.7	12.1	10.3	-3.2	4.3	10.5	3.9
11.6 Merchandises	6.4	13.2	11.1	-4.0	4.6	11.4	4.0
11.7 Primary and Agrobased Products	8.5	8.1	17.6	-4.8	5.4	11.3	4.0
11.8 Manufacturing	-2.7	28.7	3.6	-0.1	2.0	8.2	3.4
11.9 Energy	16.6	5.5	3.2	-8.7	6.9	18.2	5.5
11.10 Non Factor Services	9.4	4.2	3.2	4.4	2.2	3.4	3.4
11.11 Imports	18.2	27.6	11.8	-6.6	8.9	15.6	6.0
11.12 Merchandises	19.5	30.0	12.8	-7.1	9.7	16.8	6.5
11.13 Capital Goods	23.6	40.5	9.7	-10.6	10.4	21.7	7.2
11.14 Intermediate Goods	22.4	28.4	12.7	-5.7	12.5	17.4	8.1
11.15 Consumption Goods	17.8	25.5	15.2	-7.0	1.5	9.9	1.5
11.16 Energy	-21.1	3.9	28.4	-3.7	4.6	6.3	2.4
11.17 Non Factor Services	9.6	10.8	3.2	-1.9	2.5	4.2	1.6
11.18 Index of openness	18.6	19.9	19.7	19.4	20.1	21.8	20.4

Source: International: IMF, INDEC, FIEL estimate and forecast
 Index 11.18 is defined as (Exports+Imports)/GDP at current prices

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Table 12 ARGENTINA Prices

	1996	1997	1998	1999	2000	2001	
	<i>(Annual Average Growth Rates, %)</i>						Average 1999/2001
12.1 GDP Deflator	1.7	0.3	-1.0	-2.8	1.9	2.5	0.6
12.2 General Wholesale Price Index	3.2	0.1	-3.1	-3.8	1.5	2.6	0.1
12.3 Consumer Price Index	0.2	0.5	0.9	-1.7	2.4	2.4	1.0
12.4 Goods	0.0	-0.3	0.7	-2.7	2.0	2.9	0.8
12.5 Services	0.4	1.6	1.3	-0.4	2.8	1.8	1.4
12.6 Construction Price Index	-4.3	-1.5	0.0	-2.7	1.5	0.9	-0.1

*Source: 12.1: as estimated by the Ministry of Economy and Public Works. FIEL forecast based on the same methodology
12.2/12.6 INDEC and FIEL forecast*

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Table 13 ARGENTINA and World Financial Indicators

	1996	1997	1998	1999	2000	2001	
<i>(Stocks in Millions of US Dollars)</i>							
13.1 Total Domestic Deposits (End of Year)	53066	68172	76444	72462	79274	89274	
13.2 Total Domestic Deposits (Annual Average)	50219	62786	74048	72575	78089	87296	
13.3 Loans to Private Sector (Annual Average)	51179	57780	64587	60354	65867	73633	
							Average 1999/2001
<i>(Annual Growth Rates, %)</i>							
13.4 Total Domestic Deposits (End of Year)	22.6	28.5	12.1	-5.2	9.4	12.6	5.6
13.5 Total Domestic Deposits (Annual Average)	20.1	25.0	17.9	-2.0	7.6	11.8	5.8
13.6 Loans to Private Sector (Annual Average)	2.9	12.9	11.8	-6.6	9.1	11.8	4.8
							Average 1999/2001
<i>Argentina Interest Rates</i>							
<i>(Annual Averages in Percentage)</i>							
13.7 Deposit Rate in Pesos 30 days, Nominal	6.8	6.2	6.2	5.0	5.1	6.0	5.4
13.8 Deposit Rate in Pesos, Real	5.0	5.9	7.3	8.0	3.1	3.4	4.8
13.9 Country Risk (Spread - Avge. Life 2 Year)	4.5	3.0	6.1	8.0	6.0	4.5	6.2
<i>International</i>							
<i>(Annual Growth Rates, % and Annual Averages)</i>							
13.10 US Producer Price Index (Total)	2.3	-0.1	-2.2	-1.5	0.8	1.7	0.3
13.11 US Consumer Price Index (All Urban)	2.9	2.3	1.6	2.2	2.6	2.8	2.5
13.12 Oil Prices (WTI)	20.1	-6.5	-35.0	0.0	7.0	8.0	5.0
13.13 LIBOR 180	5.6	5.9	5.6	4.0	4.2	4.7	4.3
13.14 US Treasury 10 Years	6.4	6.4	5.3	4.3	4.5	5.2	4.7

Source: 13.1/13.7: Central Bank and FIEL estimates and forecast. Deposit rate deflator: implicit GDP deflator. 13.9 estimate based on yield over LIBOR. 13.10/13.14: IMF, and FIEL forecast

PROYECTO DE ESTUDIO SOBRE EL CAMBIO CLIMATICO EN ARGENTINA

PROYECTO ARG/95/G/31-PNUD-SECYT

***INFORME FINAL DEL SUB-PROYECTO
ESTUDIO DE MITIGACION DE GASES
DE EFECTO INVERNADERO***

Buenos Aires, diciembre 1997

EXECUTIVE SUMMARY**1. The problems of climate change in developing countries**

Although in the near future developing countries (PVD) are not required to undertake actions to mitigate greenhouse gases (GHG) emission according to commitments contained in Agenda 21, the increase in GHG concentration in the atmosphere and its potential consequences on the climate should be considered by all countries in the planet.

The uncertainty margin is significant, in spite of which consensus exists in the scientific field regarding the fact that the characteristics of global warming are of an anthropogenic origin.

Amidst this context of uncertainty the implementation –or non implementation– of actions to mitigate climate changes' eventual effects should be decided. Bearing in mind that such effects can be significant in socio-economic terms, the principle of caution should be employed when applying policies: whenever the future effect of a present cause is uncertain but can be very damaging or irreversible, it is prudent to act immediately and eliminate the causes that are best known among those on which action can be taken.

Such aspect is especially critical in the PVDs considering that the degree of vulnerability to possible phenomena strategically relates with social groups' capacity to absorb, dampen or mitigate the effects of such changes, which depend on the possibility to have technology, infrastructure and adequate means available.

In general, when discussing the impacts of climate change mitigation actions on the PVDs, the consequences that a mitigation policy implemented in a PVD would have on its own economic and social development are considered. However, the importance of analyzing the impact caused on PVDs' economic development possibilities by a growingly restrictive international context regarding GHG emission should be mentioned here.

In such sense, it should be borne in mind that most of the fossil energy traded in the international market originates in developing countries and passes to industrialized countries. A similar situation could appear in the market of other energy-intensive products, especially basic goods such as steel and other metals. On the other hand, since globalization started to evidence the need for economic adjustments in industrialized countries, the idea that international trade should be somehow regulated to prevent disloyal competition in the markets started to take root. Some voices started to demand that social and environmental aspects be considered in such regulations. The arguments presented in COP3 to delay the fulfillment of commitments by industrialized countries directly relate to such aspect.

Such considerations about impacts on development are not aimed at debating the inconvenience of climate change mitigation, which according to all analyses should be implemented in the short term. It seems important, however, to bear such aspects in mind at the time of agreeing on actions to be implemented and cost allocation.

The present degree of concentration is the result of a historic process during which one part of the planet used a Natural Capital, a commonly owned resource, applying, in the absence of control and regulation the "Law of Capture" overexploiting said resource and turning it from a "pure" into an

"impure" good, bringing about consequences for its own population and the rest of the planet. The short and long-term consequences are the additional costs to be paid by not having "free access" to such resource.

Such differential responsibility and the incorporation of equity-related considerations to climate change mitigation would force to alter the whole methodological approach to debating this issue, which can therefore not be omitted from a report on Greenhouse Gases mitigation actions.

2. Diagnosis of the Argentine situation

The socio-economic context

The Argentine economy has gone through successive development stages. The present one, dating back to the late '80s involves many causes and conditioning factors and exhibits two major features: greater internationalization of the economy and the State's withdrawal from goods and services' production.

The present economic program comprises three lines: prices stabilization on the basis of a convertibility plan, deregulation of the domestic market and State reform.

As a result of such reforms and a certain favorable international situation, growth started to expand. According to official estimates, the rise in GDP as of 1991 was significant, encouraging however a structural trend that evidences a relative lower participation by the primary and secondary sectors.

The economic reactivation that started in the second half of 1996 apparently resulted from both improvements in foreign funding conditions and growth in certain industrial areas within the MERCOSUR.

The energy context

The Argentine energy system evidences the major role played by Oil (50%) and Natural Gas (36%) in primary energy production, versus the low relevance of fuels of vegetable origin and coal, although such percentages may be overestimated because of deficiencies in the Energy Secretariat's statistics system to grasp the production and use of fuels of vegetable origin (wood, agroindustrial waste and charcoal).

Imports of primary energy sources are scarcely relevant at present, accounting for less than 4% of the country's domestic gross supply. On the other hand, the net balance of the foreign trade of crude reached about 37% of the domestic production in 1995, tripling the sale of petroleum products abroad. To that date exports had not enhanced Natural Gas production, a situation that changed in 1997 when two gas pipeline to Chile became operational and could increase even more when other export projects materialize.

Electric power plants act as a crossroad between various energy chains, as all the products represented are their input and they constitute the major intermediate use of energy offered. Petroleum products used in electric power plants are presently quite low (7% of total inputs) versus natural gas (42%) and hydraulic energy (39%). Gas' low relative price when compared to petroleum products is restraining the use of the latter solely to cases of gas supply shortages, either seasonal or permanent.

A totally different situation is that of end-use energy consumption, in line with energy for the different socio-economic sectors. In this case, petroleum products supply 50% of the demand and

natural gas one third. Petroleum products are mainly used for transport and agricultural machinery, while industries, trade and families have substituted petroleum products almost totally for natural gas in thermal uses. Consequently, and unless the natural gas substitution process evidenced in the past in such sectors reverses in future, the petroleum products' domestic market shall be essentially defined by the evolution of the transport sector and to a lesser extent by the mechanization of agriculture.

The State reform, launched in 1980, resulted in a substantial change in the institutional structure and the regulation of all energy-related activities, which evidenced different features depending on the energy chain. In general same were characterized by a transfer of the ownership right (privatization), establishing new regulatory frameworks and deregulation of one or more segments of the various production chains.

The supervision and general regulation of the electricity and gas industries is the responsibility of Federal Regulatory Agencies, established by law in the scope of the SE as autonomous bodies.

The crude production increase geared a 33% natural gas production growth between 1990 and 1995, slightly higher than the gas' domestic demand rise (30%) which was offset by means of a reduction of imports from Bolivia.

Oil companies' interest in expanding their activities in the country is clearly evidenced by an ongoing search for new markets to sell their production.

Generation in the electricity industry has also been very active since 1992. After the reform about 3400 effective MW were installed in 3 years -1/3 of the maximum load recorded in 1995- increasing reserves to 57% of the maximum capacity demand. However, 61% of the capacity added was from hydroelectric plants already under construction with public funds before the reform. However, the investments made by private players focussed totally on natural gas-based thermal generation. Such process is leading the electricity industry to a growing natural gas dependence, regarding both availability and price.

The government has driven increases in hydrocarbons' production, especially oil, without substantial restrictions on domestic oil uses. Should the country's low reserve horizon persist it could result in reviewing such policy, particularly affecting exports.

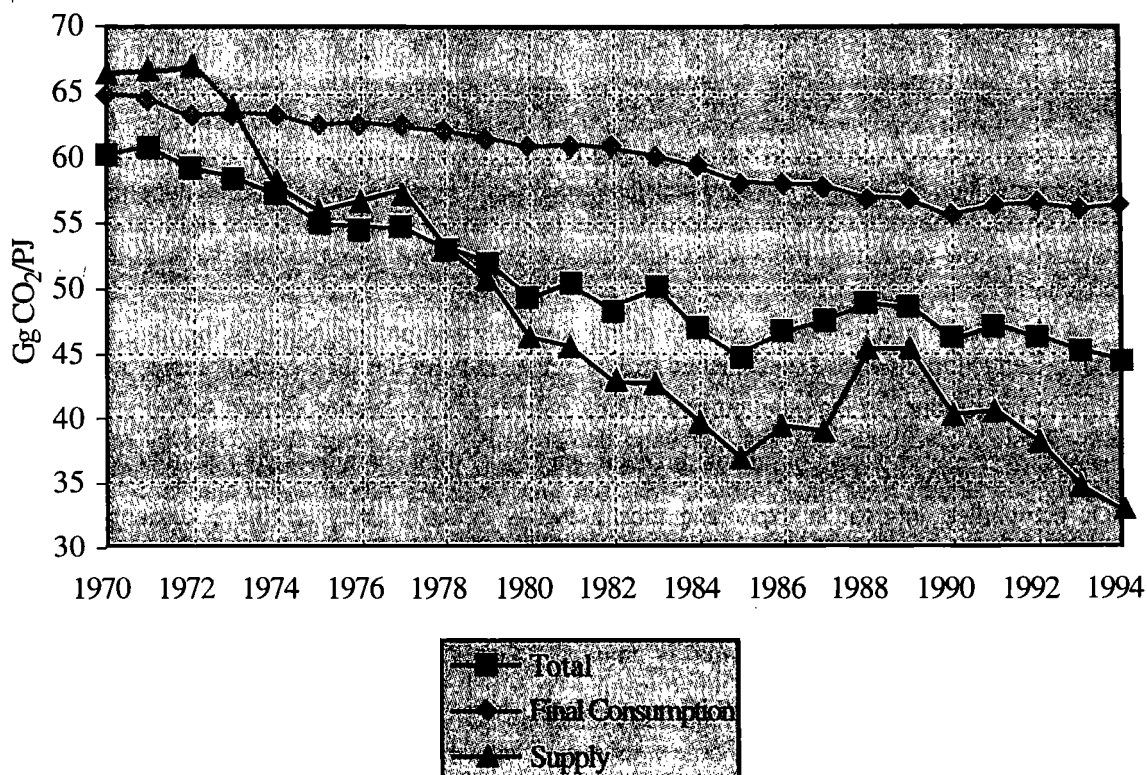
The environmental context

The Argentine public perception relative to environmental problems is changing fast. Toxic waste management, soil degradation and streams' pollution are more often an issue of public concern. On the contrary, air quality does not seem to rouse general concern, except for toxic compounds concentration in downtown Buenos Aires. The public opinion seems to be less concerned by GHG emission, although a growing interest can be noted regarding climate change potential effects.

As expected, the Inventory shows CO₂ emission's clear preeminence over the remaining GHG from energy production and consumption. Although the energy system's CO₂ emissions evidence an upward trend values are still very low when compared to industrialized countries' indicators.

Presently, 70% of CO₂ emission come from final energy consumption whereas the remaining 30% is accounted for by energy supply-related activities. The Transport sector is not only responsible for 32% of total emission, but its consumption pattern largely contributes to total emission evolution. The industry and buildings' energy consumption, despite an almost 16% contribution to total emission each, have a moderate impact due to the high natural gas share in their energy consumption.

As for the environmental efficiency of the Argentine energy system, the following graph illustrates CO₂ evolution per energy unit supplied.

Evolution of CO₂ specific emission

As seen, the amount of CO₂ emitted from each PentaJoule supplied shows a very clear trend. Total specific emission decreased persistently throughout the whole period being today 25% lower than in 1970.

It can be stated that the Argentine energy system has reached a degree of development such that in future an important effort shall be required to dampen the effects of economic growth on CO₂ total emission.

3. Methodological aspects

Following the guidelines set forth by the World Environment Fund (Fondo Mundial para el Medio Ambiente) (FMAM) for climate change mitigation studies, two future scenarios of the system under analysis are developed. One of them (*Base Scenario*) refers to the evolution expected given the system's present dynamics, without resorting to actions or explicit policies to abate greenhouse gases' (GHG) emission or to increase greenhouse gases (GHG) absorption capacity. The second (*Mitigation Scenario*) on the other hand, involves selecting a set of climate change mitigation options, to evaluate the benefits derived from its implementation.

The formulation of scenarios is based on a *Diagnosis* allowing to understand the relations between economy-energy and energy-environment, as well as the economic performance and the energy system's behavior, analyzed in the present study. The impact on atmospheric GHG accumulation is also studied. After the *Diagnostic* stage and prior to formulating the *Mitigation Scenario*, mitigation options available in the sectors under analysis are identified and characterized.

In the case of the Base Scenario, efforts were made to reproduce business strategies as closely as possible in the context of the development expected in the Argentine socio-economic system, resorting to the experience acquired since energy deregulation. To formulate the Mitigation Scenario the options available in the industry, transport and energy industries themselves were analyzed, selecting first those considered easier to implement although the objective was to include enough industries so that the country's mitigation potential could be assessed.

Based on these hypotheses, the energy system's detailed operation is analyzed in both Scenarios controlling energy flows' consistency, from reserves to consumption, using the LEAP model (Long-range Energy Alternatives Planning System) developed by the Stockholm Environment Institute - Boston Center at the Tellus Institute.

LEAP is a simulation model that contains 6 modules and an environmental data base used to calculate environmental impacts associated to the energy system's expected evolution. The purpose of the 6 modules is to analyze: Demand, Biomass, Environment, Scenario Assessment, Results' Aggregation.

On the basis of a data base generated specifically on the basis of emission coefficients adopted in the Report on GHG Emission Inventory in Argentina, the LEAP supplied the GHG emissions compatible with those calculated in the Inventory Study for 1990 and 1994.

4. Developing scenarios

The International Context

In the face of a growing globalization process, the Argentine situation evolution will largely depend on the international context. Such dependence becomes evident at different levels, of which the economic, technologic and energy-environmental are the ones relevant to this study.

Economic aspect

The globalization process shall require central economies to further adjust, especially in Europe. However, after the adjustments made since the beginning of the eighties, global growth is expected to be slow albeit steady in the long term, although more moderate consumption patterns shall be adopted.

The geographic displacement of production towards less developed countries, geared by globalization, will not necessarily cause recession in the central economies due to the development of other activities in the service area, the existence of positive financial flows and the control of technology resulting from the corporate ownership structure at international level. However, unemployment may generate substantial changes in consumption and labour patterns that could impact other regions as well.

Industrialized countries shall gradually eliminate subsidies and tariff barriers imposed on certain raw materials originating in developing countries, especially Latin America. However, the greater potential for trading agricultural products shall derive from global economic growth.

It is assumed that the international financial market shall be more stable, leading to more advantageous funding rates and terms. Conditions for foreign debt repayment shall also improve.

The following are the long-term economic growth hypotheses:

Región	Rate Period 1995/2030		
	1995/2005	2005/2030	1995/2030
Africa	3.0%	2.2%	2.4%
Asia (PVD)	6.5%	5.6%	5.9%
E. Europe	4.3%	3.7%	3.9%
M. East	2.5%	3.2%	3.0%
L.America	3.8%	3.9%	3.9%
Japan	2.5%	1.9%	2.1%
Europe	2.5%	2.0%	2.1%
USA+Canada	2.5%	2.2%	2.3%
TOTAL	3.0%	2.8%	2.8%

Technological aspect

Future technological development is part of the international context in which developing countries (PVD) act as "technology takers". The PVD will only differ on the basis of the advantages and obstacles posed to the penetration of new energy technologies and to the production of goods and services, as a function of their strategies to join international markets.

Based on the Workshop "Technological Innovation in the use of energy", attempts were made at establishing a clearer framework on future technological expectations. The results were extremely useful to elucidate international efforts in the development and introduction of new technologies. The conclusion drawn was that the international research dynamics and the introduction of new technologies evidence a fast development and are fuelled by economic factors and environmental concerns.

It has been assumed that the technologies available in the international field in the next 30 years shall not be notoriously affected by the position of industrialized countries' governments with respect to climate change.

Energy-environmental aspects

International energy markets perspectives shall strongly depend on the international attitude vis-a-vis environmental concerns.

Although the international community is rapidly becoming aware of the fragility of the environment and the dangers of its ongoing degradation, effective environmental protection involves very deep changes in consumption patterns and in present economic organization standards, difficult to implement in the current political and economic context. A proof of this is the obvious difficulty to reach an agreement on governments commitments to abate GHG emissions.

In spite of the uncertainty on GHG reduction margins and the terms that will finally be agreed to attain such levels, the PVD will be strongly affected by such process. Regardless of the commitments industrialized countries may locally undertake, pressure shall be exerted on the PVD for them to contribute to climate change mitigation. In such sense restrictions shall be imposed on their products in both industrialized countries' and financial markets, based on environmental considerations.

As regards the evolution of energy products' international markets and in spite of the fact that oil's share in primary energy supply has decreased, its price still is a benchmark for energy, given its relative importance compared to primary energy sources, the fact that it is a tradable good and also a fuel substituting for other sources.

In the context of OPEC's loss of power, the European Union's steady import percentages and increased levels by the U.S. and China, Russia's production upkeep and increases in Great Britain's and Norway's supply, a certain stability is forecast for the price of crude oil with a slightly upward trend, especially after 2010. Crude oil international prices act as benchmark to define the evolution of petroleum products and gas' domestic prices.

Domestic socio-economic context

The socio-economic scenario assumes as a starting point that the growth of regional blocks shall basically depend on a greater opening of Northern developed countries' markets to PVD products.

At a regional level, the agreements signed within the MERCOSUR shall help stabilize national economies and lead to a search for more coordinated solutions among countries. In turn, countries' stability shall become a key issue for the success of MERCOSUR. The integration process will not only increase exchange but also result in greater sectoral complementation and increased competitiveness.

Argentina will mostly be geared to agroindustries and mining, which involve activities that rely on and impact different chains. Significant impact will result from investments in the Agro-industries, Mining and complementary investments in these sectors, many of which have a strong environmental impact.

Growing specialization is seen in sectors devoted to the processing of natural resources, be they traditional or industrial commodities (non-mineral oils, iron and steel industry, petrochemicals, natural gas, aluminum, fish flour, etc) whose plants have undergone strong restructuring to approach international efficiency levels, although in some cases, with noticeably lower production scales.

As for the exporting profile, all indicators seem to prove that major items will closely relate to the production of gas, minerals, fuels and commodities in general, with a low added value.

Long-term growth of the GDP

Interannual growth rates and GDP values by sector in 10⁶ US\$ of 1994

	GDP	a. rate	GDP	a. rate	GDP	a. rate	GDP	a. rate	GDP
	1995	1995-05	2005	2005-10	2010	2010-20	2020	2020-30	2030
Agro-industries	21975	4.4%	33729	7.5%	48410	5.5%	82713	5.5%	141288
Mining	6953	3.1%	9434	8.0%	13863	7.0%	27261	6.0%	48831
Industry	71874	3.8%	104597	5.0%	133493	5.2%	221609	4.5%	344162
EE, GD & Water	5705	3.8%	8261	4.8%	10453	4.0%	15458	4.0%	22876
Construction	15155	4.1%	22722	4.5%	28324	3.8%	41124	4.5%	63845
Commerce	46535	5.2%	77158	4.8%	97528	3.8%	141620	4.2%	213703
Trans. y Comm.	13907	5.1%	22921	5.4%	29808	4.5%	46306	5.0%	75427
Finances	41877	4.1%	62386	4.2%	76623	4.0%	113429	3.8%	164718
Services	45108	2.9%	59773	4.0%	72726	3.2%	99654	3.5%	140557
TOTAL	269089	4.1%	400981	5.0%	511228	4.4%	789174	4.4%	1215407

As a result of the assumptions relating to the long term growth path, the production structure would tend to concentrate in goods producing sectors, while service sectors would decrease in relative terms.

From the production standpoint the most salient feature shall be a relative reprimarization of the economy. However, such trend would be offset by the industry's relative consolidation. Argentina would thus grow above the region's average, at rates however close to those forecast for the region.

On the other hand, trade would benefit in the long term from a favorable ratio in the prices of primary export products and the high added value of agroindustrial exports.

5. Results expected in the Base Scenario

The evolution of energy consumption

This scenario assumes that government intervention in future energy markets shall not place barriers to private businesses, devoting only to the implementation of policies aimed at: controlling competition levels in domestic energy markets, promoting the creation of regional energy markets on competitive bases, guarantying future energy supply, enhancing energy efficiency.

It is assumed that energy supply follows the trend in which energy efficiency exhibits a dynamic behavior, where improvements occur "naturally" without specific intervention.

Total final energy consumption

SOURCES	1995	1995	2005	2005	2010	2010	2020	2020
	10 ⁶ GJ	%	10 ⁶ GJ	%	10 ⁶ GJ	%	10 ⁶ GJ	%
Hydrogen							16.59	0.4
Biomass & O. Prim.	94.05	5.2	129.93	5.4	162.03	5.3	250.11	5.4
Coals	3.58	0.2	4.80	0.2	5.88	0.2	9.09	0.2
Petroleum Products	700.90	38.9	805.14	33.4	978.11	32.2	1475.11	31.9
Electricity	200.92	11.1	324.03	13.4	416.40	13.7	634.25	13.7
Distributed Gas	660.75	36.7	956.21	39.7	1246.10	41.1	1924.19	41.6
GLP	59.24	3.3	69.18	2.9	75.86	2.5	91.84	2.0
Other Gases	26.77	1.5	41.67	1.7	50.63	1.7	69.46	1.5
Non-Energy	56.52	3.1	78.53	3.3	100.16	3.3	158.85	3.4
TOTAL	1802.73	100.0	2409.49	100.0	3035.17	100.0	4629.49	100.0

The annual cumulative growth rate between end years (1995/2020) reaches 3.8%.

Energy productivity evolves, measured on final consumption (GDP/Final Consumption), increasing by 14% for 2020 compared to 1995 values.

Total final consumption increases by the following percentages compared to base year figures:

1995	2005	2010	2020
Base	+34%	+68%	+157%

There is a penetration of distributed gas which becomes the most important source, while Petroleum Products, PLG and Other Gases lose ground and Electricity grows.

As for the share of various sectors, it should be pointed out that:

The most dynamic sector is Agriculture, Silviculture and Fishing, whose share increases 1.63 points (27%) in 2020 with respect to the base year.

The industrial sector's relative importance increases 1.16 points (4.5%) in 2020.

The Residential, Commercial and Institutional and Own Consumption sectors' share drops.

The Transport sector's share slightly decreases, with a percentage above 28% it still remains a higher final consumption sector.

Including supply-related data, considering that trends will remain stable in the electricity, gas and oil industries, the following should be pointed out:

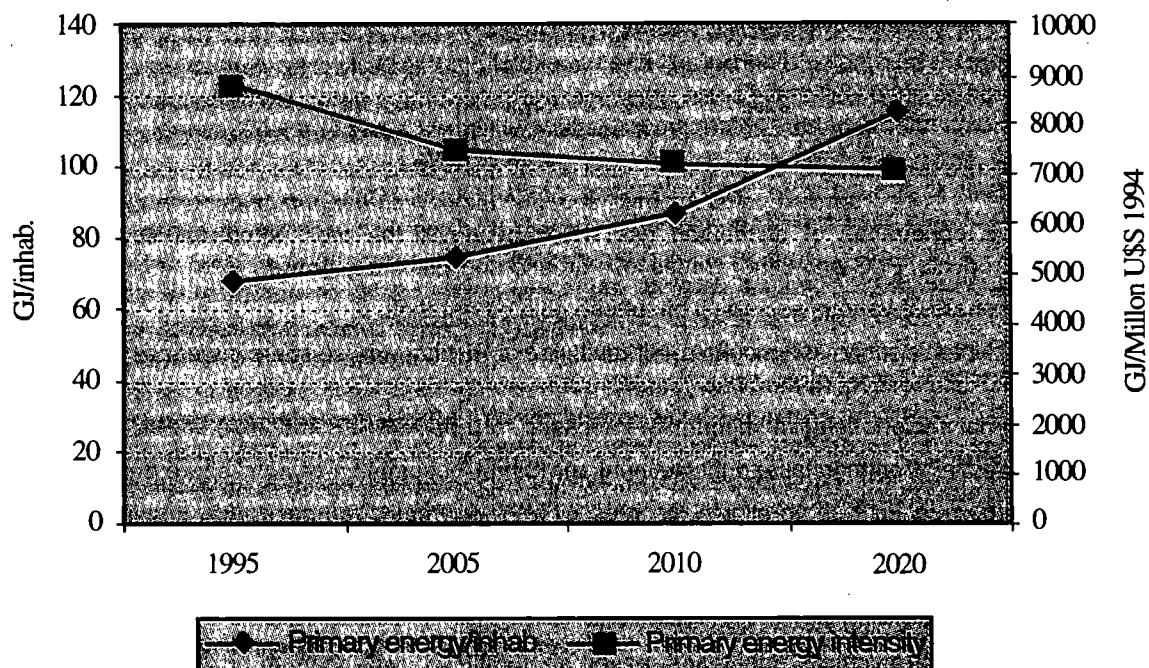
The major role of electricity generation, based on combined cycle thermal power plants (90% of thermal generation).

The need to undertake very significant exploration efforts to meet the scenario's natural gas requirements. Discoveries shall be kept at a pace implying the addition of 70000 million cubic meter of gas a year to keep an adequate reserve horizon (8/9 years).

Crude oil's domestic production is assumed to plateau in 52 million cubic meter a year by the year 2002, a level that could be maintained until 2005. From such date, production would decline to reach 35 million cubic meter in the year 2020. Such crude oil production would be insufficient to meet the needs of refineries which would then have to import one third of their requirements.

Primary energy consumption evolution implies an increase in natural gas' share, a drop in coal and nuclear and a substantial loss in oil and petroleum products.

An increase in energy efficiency is also expected as a result of technological progress and the growing need to sustain market competitiveness.

Energy intensity and per capita consumption**GHG Emissions**

According to the GHG Emissions Inventory results, nitrous oxide (N₂O) emissions from the Argentine energy system are clearly negligible, 0.2% of CO₂ emission, even considering that their warming potential is equivalent to 320 fold that of CO₂.⁽¹⁾ Given that such ranges fall within assessment errors, it has been decided not to measure future N₂O emission and restrict the analysis to CO₂, CH₄, NO_x and CO emissions for both scenarios.

Gas Type	Unit	Inventory			Mitigation study		
		1990	1994	1995	2005	2010	2020
CO ₂	Gg	97402	109001	118190	143900	182620	281660
CH ₄	Gg	371.8	474.9	35.0	61.1	108.4	203.1
NO _x	Gg	535.9	619.2	684.1	839.3	1083.8	1731.5
CO	Gg	1510.7	1735.7	1752.9	1624.5	1813.1	2052.0
CO ₂ Equiv.		<u>132479</u>	<u>150611</u>	151671	183842	<u>234067</u>	362052

⁽¹⁾ In order to compare various GHG volumes the following factors were adopted for heating potential

CH₄: 24.5 (Source UNEP-RISO)

N₂O: 320 (Source: UNEP-RISO)

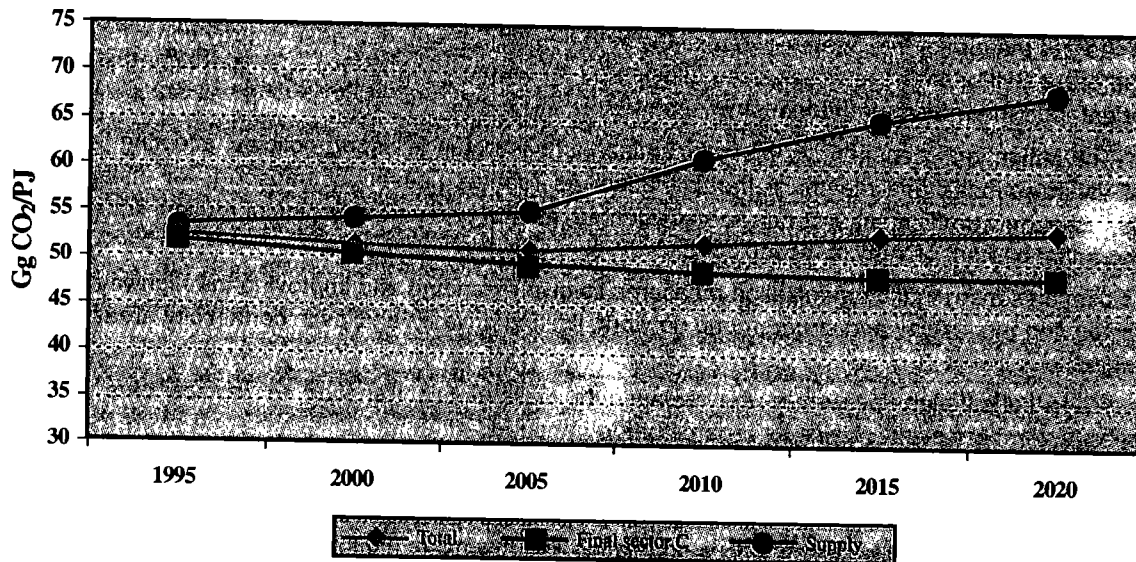
NO₂: 40 (Source: IPCC)

CO: 3 (Source: IPCC)

The most substantial energy system's emissions originate in carbon dioxide, although the growth of methane emission shall be faster in future. In spite of its different growth pace, direct CO₂ emission accounts for 78% of the total throughout the period, whereas methane would barely exceed 1% in the horizon year.

The "environmental efficiency" of energy used by the whole energy system and various consumption sectors and/or energy supply-related activities can be measured by emission's specific coefficient.

CO₂ specific emission



As shown in the graph total specific emission would remain relatively stable throughout the whole period under analysis. Such total specific emission's long term stability implies interrupting the historic trend prevailing in the last 25 years affected by a 25% drop.

As for methane emissions, in spite of the expansive context of gas production and consumption, the gas industry as a whole would increase its total methane emission by 12% throughout the period.

The evolution of NO_x emission will fundamentally rely on three sectors: transport, agriculture and cattle breeding and electricity generation. The increase of conventional thermal generation, even burning natural gas, would increase NO_x emissions from electricity power plants at a pace higher than that of the whole energy system.

As for CO, practically 99% of CO emission originates in final consumption sectors, although the growth in emission from power plants will prompt a rise in energy supply-related activities' share which will anyhow account for under 2% of the total in the horizon year.

6. The Mitigation Scenario

From this study's perspective, the Argentine Mitigation Scenario only differs from the Base Scenario to the extent it implies the implementation of options and actions to abate GHG emissions within its territory. The electricity industries' organization and the operators' interest shall remain unchanged, although development strategies should adapt to the new context outlined by official policies to mitigate climate change.

The mitigation options

As it is the aim of this Scenario to take the best opportunities to decrease energy consumption and therefore GHG emissions, it has been considered that regarding final consumption efforts should be oriented to the transport and industrial sectors.

The Mitigation Scenario involves substantial changes in the transport policies, affecting the share of various modes and means of transportation. As regards passenger transport, for instance, the impact of new traffic measures has been evaluated, as well as the substitution of modes, sources, and the enhancement of vehicle technology.

In such sense, traffic organization measures involve extending and improving the highway system, expanding the railway and underground network, limiting private vehicles in certain city areas, among others.

Mode substitution focuses in the increase of mass public transport to replace cars and the substitution of trucks for trains as regards cargo transport.

Additionally, less emitting sources should also be promoted (CNG) and a decrease in the age of the car fleet as a way to improve its mean specific consumption.

In the case of industry, actions focus on heating and mechanic uses, while the role of cogeneration is also being considered. As for heating and mechanic uses, changes in processes are assumed, as well as the partial replacement of equipment and general preservation measures.

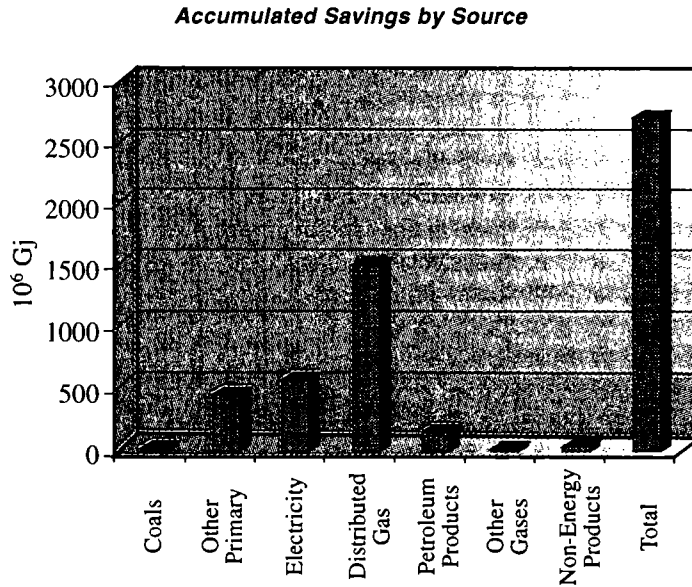
As for supply-related activities special attention was given to electricity generation as it involves the highest fuel consumption within the energy sector. In this case mitigation options cannot be based on improving energy efficiency, considering the high future performance of conventional thermal stations. Therefore the search aims at GHG emission-free technologies.

The effects of mitigation measures

The Industrial Sector

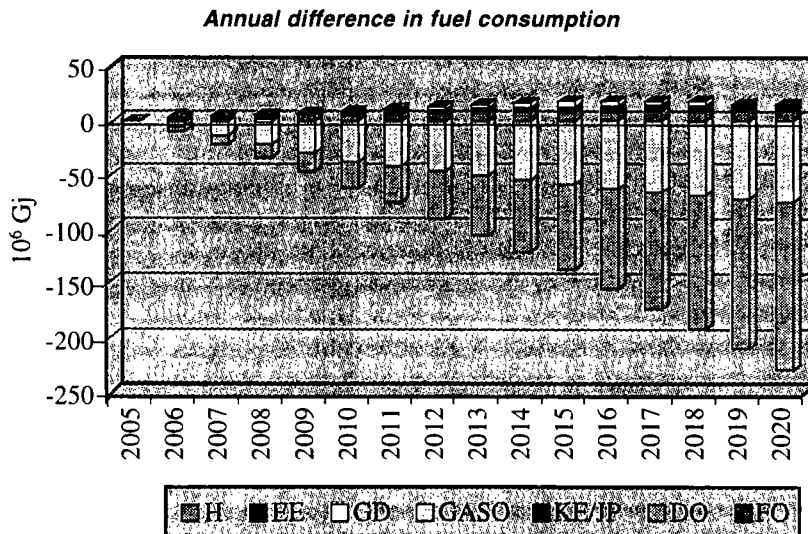
The hypotheses assumed on the possibility of undertaking mitigation actions in the industrial sector by improving present equipments' efficiency, sources' substitution, incorporation of more efficient technologies and processes brings about an impact that might be considered spectacular. The difference between both scenarios is 24.7% in 2020. Of such savings, distributed gas accounts for 55% and electricity for 20%. The energy-intensive industry drops its consumption by 21.2% whereas non-energy intensive industry decreases consumption by 29.5%, in both instances compared to base scenario figures.

Effects are illustrated in the following graph, which shows that the responsibility for lower consumptions lies in distributed gas, electricity and other primary sources.



The Transport Sector

“Savings” accumulated as a result of greater efficiency amount to 1476 million GJ, i.e. 1.35 fold the annual consumption projected for 2020, and close to three fold the base year consumption. The lower consumption concentrates in diesel oil and gasolines, and to a lower degree in kerosene/JP.



Considering highly emitting sources' lower consumption, the penetration of zero emission sources such as electricity and hydrogen is achieved (at least at consumption level). Hydrogen's accrued differential consumption is 113 10⁶ GJ and that of electricity 32 10⁶ GJ. Distributed gas (CNG) accounts for 42 10⁶ GJ additionally accrued and fuel oil 8.61.

The electricity supply sector

In spite of the lower growth rate of electricity requirements in this Scenario compared to the Base Scenario, in coming years the pace of new power plants' incorporation is kept up, considering that the decision to install most of them has already been made and they are already under construction. As for the remaining ones, they represent operators' need to improve their market competitiveness.

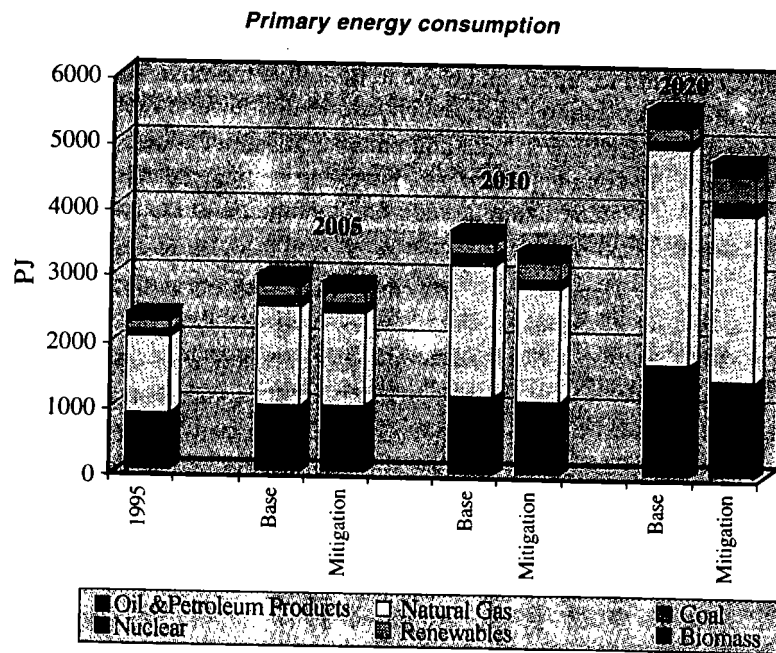
In such situation it is possible to install about 5000 MW less than in the Base Scenario. The search of GHG emission-free generation technologies implies not only savings in installed capacity but also a radical change in the structure of added power plants.

Both Scenarios differ as regards the size and type of energy sources consumed in power plants. As for structure, fossil fuels would progressively decrease their share and reach 54% of power plants' total consumption in the year 2020, compared to 82% forecast in the Base Scenario.

Primary energy consumption

Considering the functioning conditions of the Mitigation Scenario, primary energy consumption growth in the next 25 years would be equal to 2.9% accrued annual rate, becoming faster after the year 2005 (3.5%).

The mitigation actions selected, especially in the electricity sector, imply greater diversification than in the Base Scenario regarding primary sources' consumption.



In this case oil and petroleum products' loss of share (7% in the next 25 years, just like in the Base Scenario) would be captured at the same pace by natural gas and renewable sources (3% each) and to a lesser extent by nuclear fuel (1%). Although renewable sources include both hydro and wind electricity and hydrogen, the strongest impact in terms of primary energy consumption lies in hydroelectric power plants construction. Anyhow, natural gas shall still be the major primary source as regards consumption, with a maximum 52% penetration in the horizon year.

Mitigation actions' impact on the Argentine economy's energy intensity are clearly observed when comparing the growth expected in both Scenarios. Primary energy consumption per GDP unit shall decrease 30% by the end of the period, compared to present figures. This implies a 10 point reduction above Base Scenario's forecasts.

It is interesting to point out that considering equal "energy service" supply in both Scenarios, per capita primary energy consumption after mitigation actions shall be about 14% lower than the Base Scenario forecasts for the year 2020. However, the fast growth rate assumed, together with Argentina's low demographic growth rate would result in a clearly upward trend in the country's per capita primary energy consumption.

GHG emissions

The expected evolution of the four gases under analysis in the Mitigation Scenario appears in the next Chart, where values corresponding to the base year and the horizon year in the Base Scenario were also included to facilitate the comparison between both Scenarios.

GHG Emissions in the Mitigation Scenario

(in Gg)

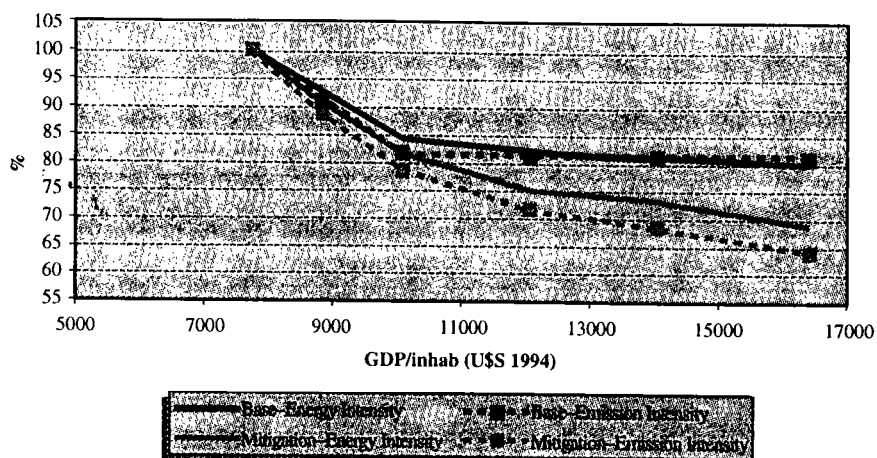
Gas Type	Units	Base Year	Mitigation Scenario			Base Scenario
			2005	2010	2020	2020
CO ₂	Gg	118190	138440	161860	223780	281660
CH ₄	Gg	35.0	61.1	113.4	199.6	203.1
NO _x	Gg	684.1	824.1	1001.6	1463.4	1731.5
CO	Gg	1752.9	1622.9	1538.9	1437.5	2052.0
CO ₂ Equiv.		151671	177767	<u>209319</u>	291517	362052

Compare 2010 BAU: 234067

Even if mitigation actions are implemented the true differences between both Scenarios shall become more clearly evident after the year 2005. CO₂ total emission savings shall amount to 20700 Gg in the year 2010, rising to 58000 Gg in the horizon year. In terms of annual emissions expected in the Base Scenario, such savings would imply 11% reduction in the year 2010 and almost 21% in 2020. Total specific emissions would persist along a downward trend throughout the period under analysis, with a 7% decrease compared to present values.

To overcome the analytic constraints posed by specific emission per energy unit used as an indicator of environmental efficiency in the use of energy, the energy pathways and CO₂ emission were calculated for both Scenarios.

The energy pathway graphically represents the variations in domestic economic activity's energy intensity (energy offered per GDP unit) as a function of the economic system's evolution, measured by the per capita GDP. A similar curve can be drawn for CO₂ emissions, i.e. the emissions pathway, which represents the emissions' evolution per GDP unit as a result of changes recorded in the per capita product.

Energy and CO₂ emission pathways

Mitigation measures as a whole, would permit a reduction in the Argentine economy's energy intensity in the next ten years, 3% above the 16% considered in the Base Scenario. It is important to point out that such trends would materialize in an openly expansive economic activity, resulting in 30% increase in present per capita product.

In the longer term their impact on energy intensity would increase, adding a reduction of over 10 points to the drop considered in the Base Scenario. Compared to present values, energy intensity in the Mitigation Scenario would drop over 30% as a result of the combined effect of technological innovation, structural adjustment and the promotion of a higher energy efficiency.

As for total methane emissions, same shall originate mainly in final energy consumption sectors. In effect, future growth of CH₄ emissions shall be driven by the transport sector, whose share would persistently grow, to reach slightly over 97% in the horizon year, compared to the present 95%, values similar to those expected in the Base Scenario.

Differing from figures expected in the Base Scenario, the future evolution of NO_x emission shall be defined by two major sectors: transport and agriculture and cattle breeding, as the decrease in electricity generation by thermal power stations would largely reduce the share of electricity power plants in NO_x total emission.

The simultaneous decrease of NO_x emission in electricity power plants and in transport as a result of the decrease in the use of petroleum products, highlights the relevance of agriculture and cattle breeding in NO_x total emission in the Mitigation Scenario.

As for CO, mitigation measures in the transport sector shall result in a 34% reduction of the sectoral emission expected in the Base Scenario for the year 2020. Given transport's high participation in CO total emission, the global effect of such measures would be a persistent reduction of total CO volumes emitted by the energy system, which in the horizon year shall reach only 82% of present volumes.