



Ideias • Diálogos • Defesa

Innovation and Defense from a Brazilian Perspective

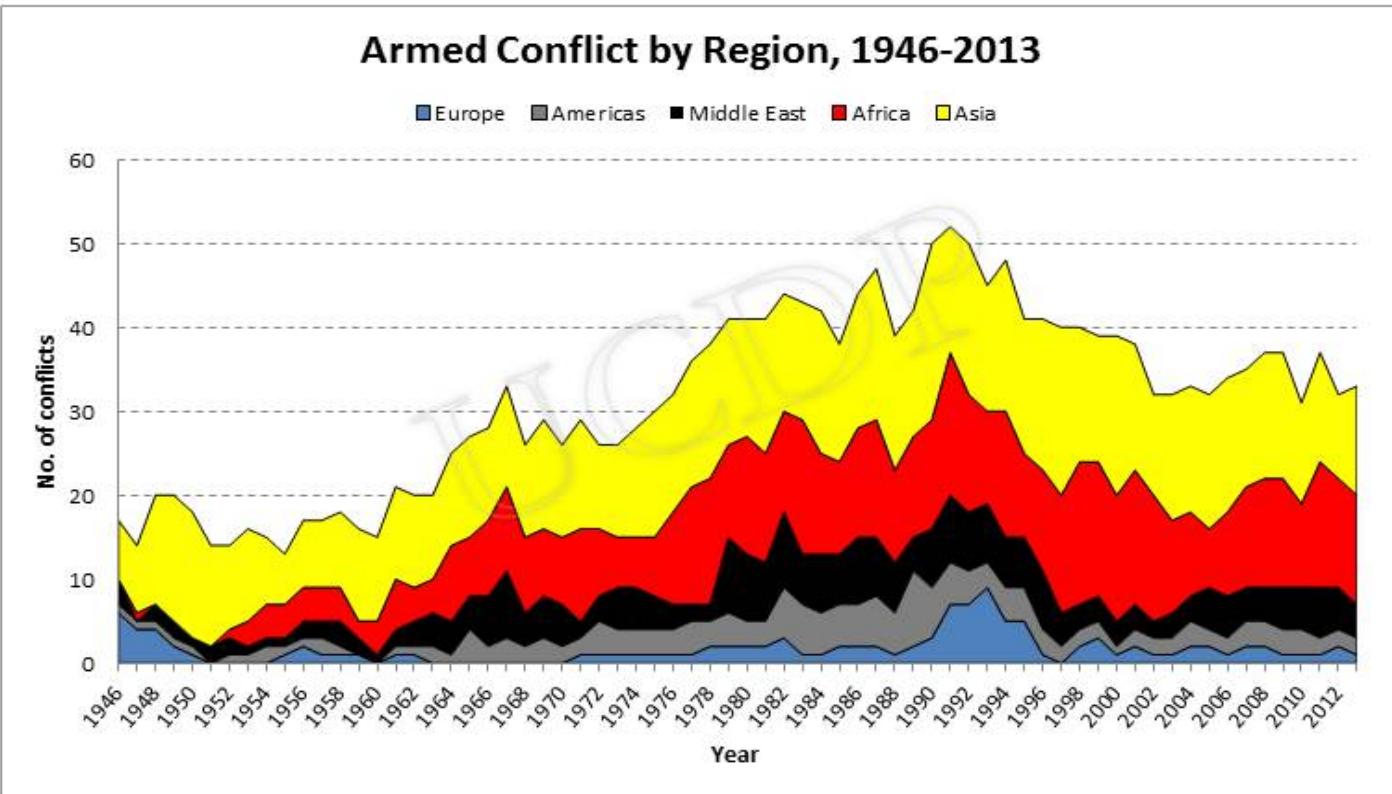
King's College, November 2015

Prof. Antonio Jorge Ramalho
UnB/ IREL; Pandiá; ESUDE

Agenda

- The challenge of investing in defense
- To understand Brazil, take the long view: This crisis will end; Institutions will be more solid and effective
- Defense in the Brazilian Society & economy
- The role of Defense in Innovation

Figures and trends



Source: http://www.pcr.uu.se/digitalAssets/66/66314_1armed-conflict-by-region-jpg.jpg (Access Aug 04, 2015)

© UCDP 2014

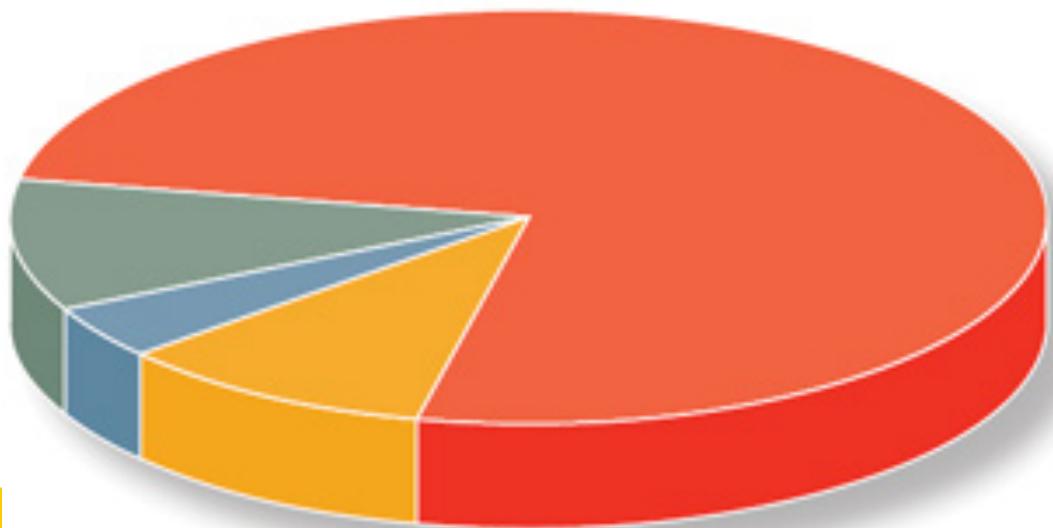
Military expenditures: World & South America



Gastos militares (em US\$ bilhões, preços constantes de 2011)

Peaceful countries, violent societies

Figure 1 The distribution of the global burden of lethal violence

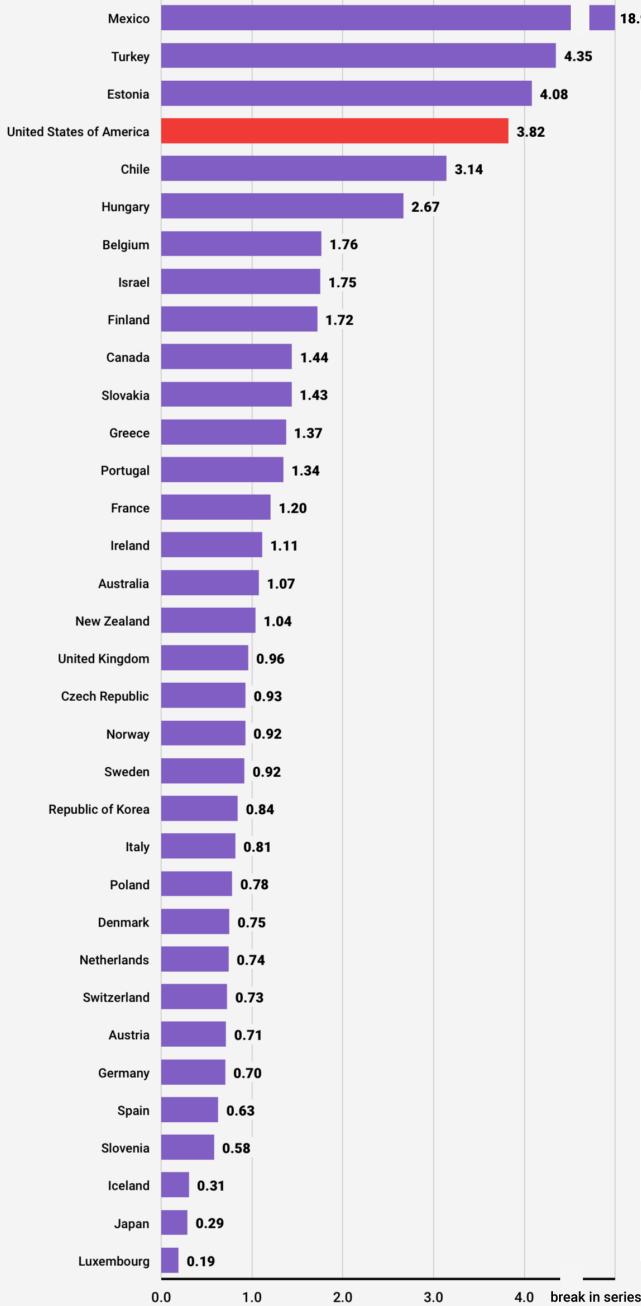


LEGEND:

- Direct conflict deaths (70,000; 14%)
- Intentional homicide (377,000; 74%)
- Unintentional homicide (42,000; 8%)
- Legal intervention killings (19,000; 4%)

Source: Geneva Declaration Secretariat (2014) <http://www.genevadeclaration.org/en/measurability/global-burden-of-armed-violence/gbav-2015/executive-summary.html> (Access Aug 05, 2015)

HOMICIDES PER 100,000 PEOPLE



Peaceful countries, violent societies

■ Percentage of firearm-related homicide ■ Firearm homicide rate

PERCENTAGE OF HOMICIDES THAT ARE FIREARM-RELATED



Northern Europe

Eastern Asia

Oceania

Western Europe

Eastern Europe

Southern Europe

South-eastern Asia

Northern Africa

Western Asia

Central Asia

Eastern Africa

Southern Asia

Northern America

Western Africa

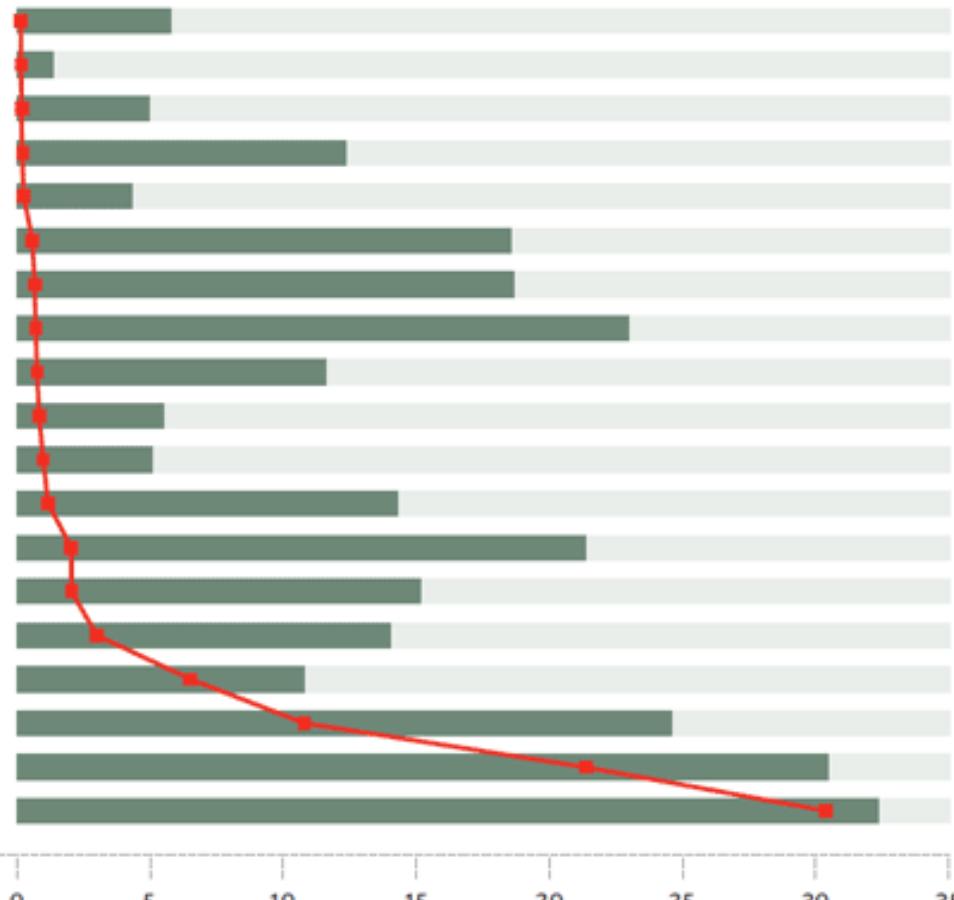
Middle Africa

Southern Africa

South America

Caribbean

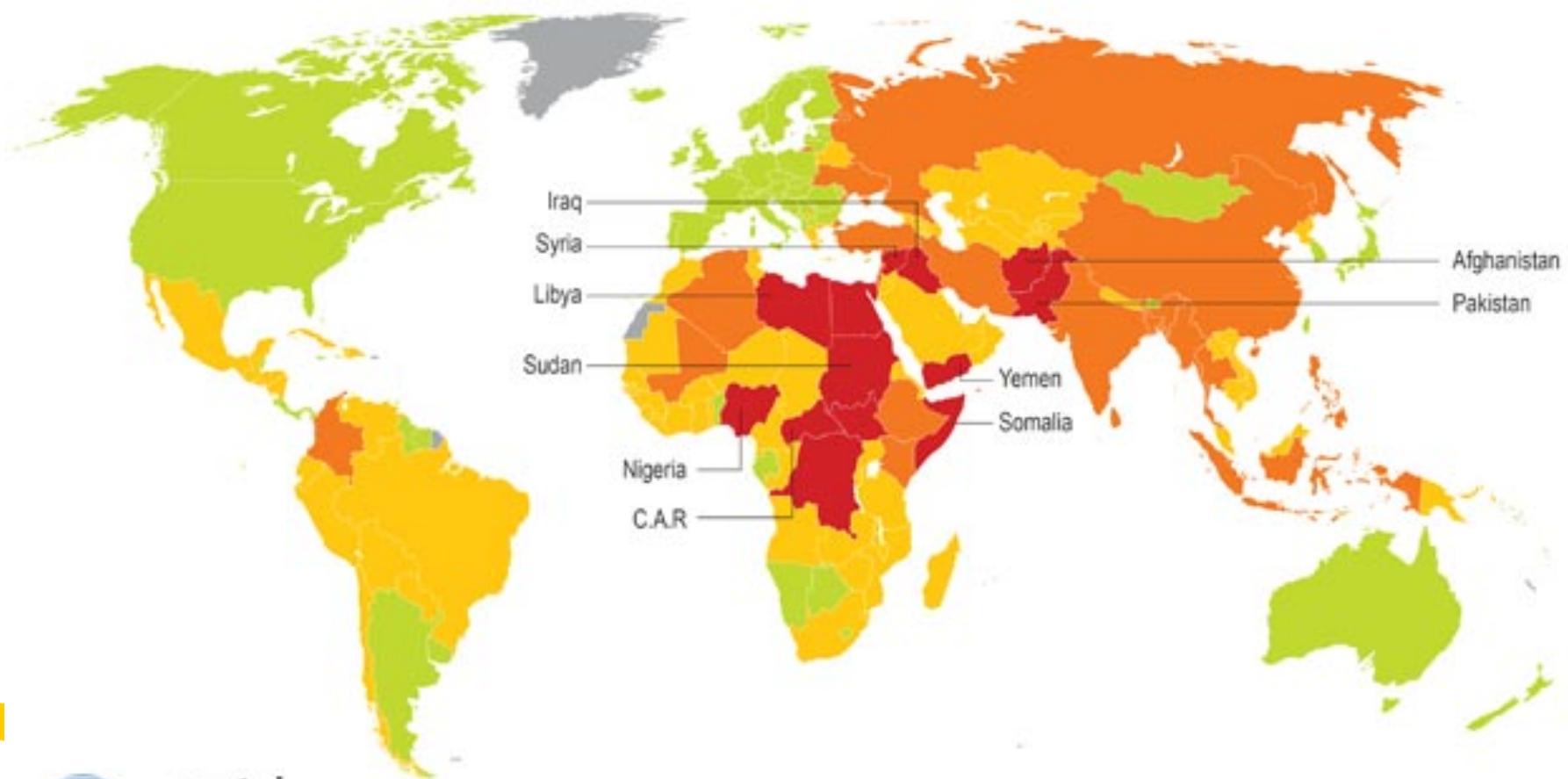
Central America



FIREARM HOMICIDE RATE PER 100,000 POPULATION

Source: Geneva Declaration Secretariat (2014)
<http://www.genevadeclaration.org/en/measurability/global-burden-of-armed-violence/gbav-2015/executive-summary.html> (Access Aug 05, 2015)

Risky places...



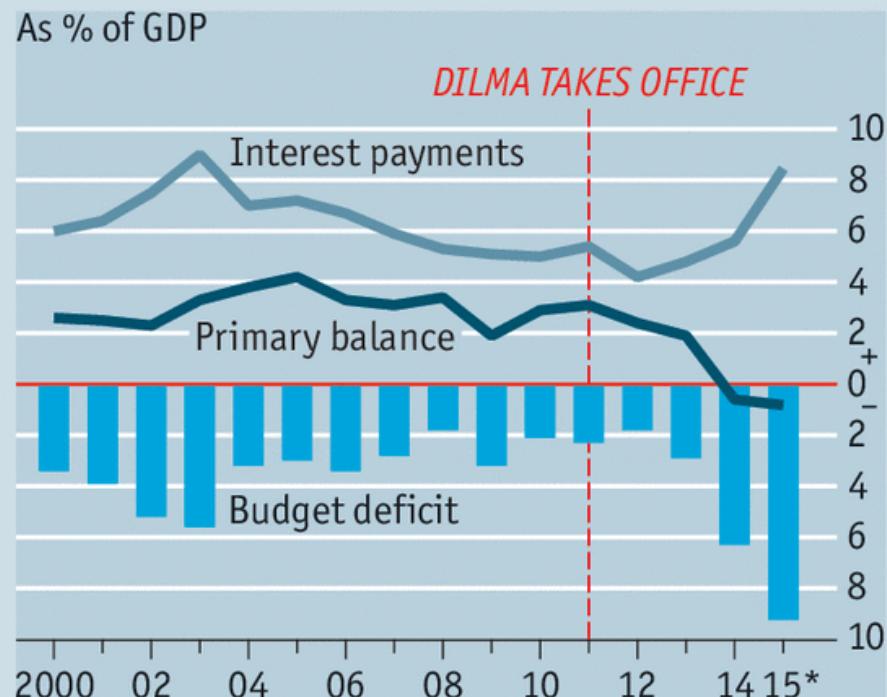
This crisis will end;
Institutions will be more solid
and effective

The need to improve...

Going the wrong way

Brazil

As % of GDP



Real interest rates

%

6

5

4

3

2

1

0

6

5

4

3

2

1

0

Brazilian real per \$

Inverted scale

0

1

2

3

4

5

6

Sources: Economist Intelligence Unit; Thomson Reuters; Haver Analytics; Goldman Sachs; Central Bank of Brazil *12 months to August

Economist.com

Source: Economist, Oct 31st, 2015

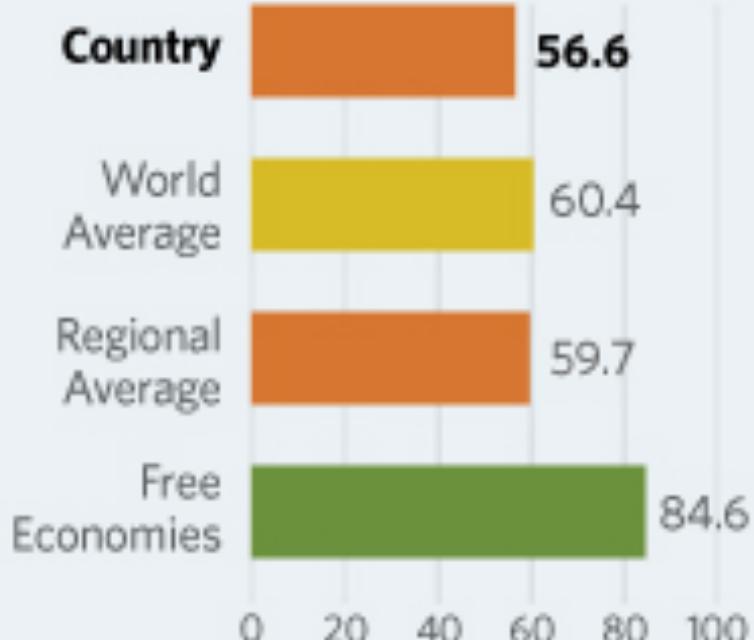
(<http://www.economist.com/news/finance-and-economics/21677232-are-dire-public-finances-hindering-central-bank-tackling-inflation-broken>)

The need to improve...

Country's Score Over Time



Country Comparisons



Source: Heritage 2015 Index of Economic Freedom
(<http://www.heritage.org/index/country/brazil>)

Fonte: FACES

Inflação - média mensal no ano - Evolução: 1940-2010

— Inflação Brasil - média mensal - IPC/Fipe

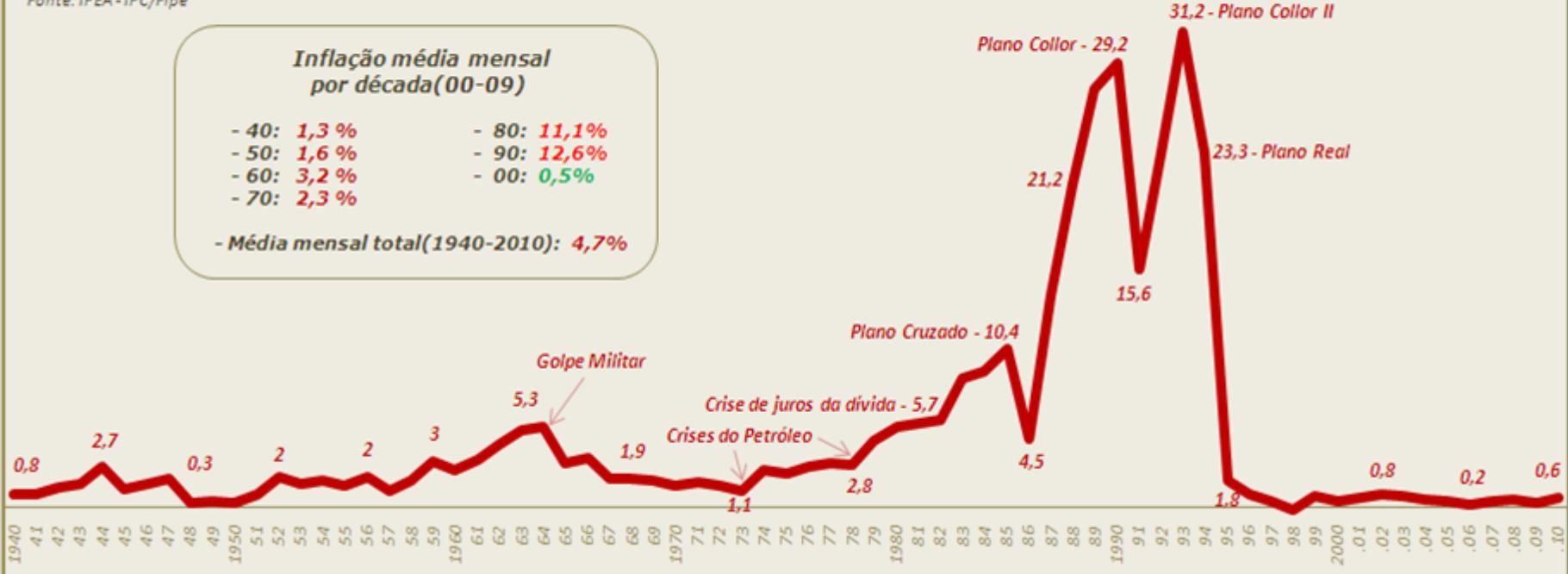
brasilfatosedados.wordpress.com

Fonte: IPEA - IPC/Fipe

Inflação média mensal por década(00-09)

- 40: 1,3 %
- 50: 1,6 %
- 60: 3,2 %
- 70: 2,3 %
- 80: 11,1%
- 90: 12,6%
- 00: 0,5%

- Média mensal total(1940-2010): 4,7%



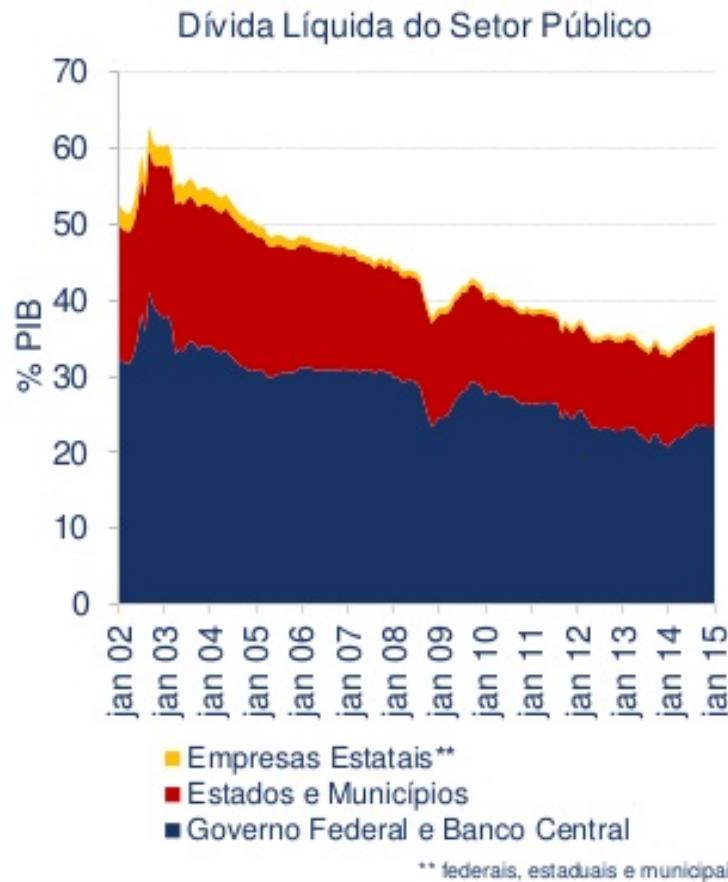
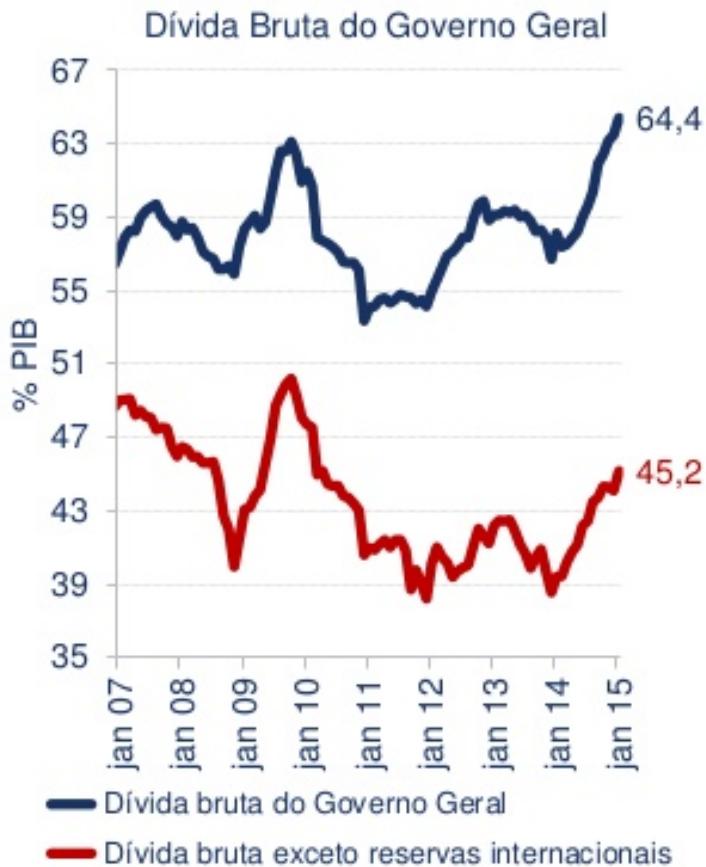
CRISE NA INDÚSTRIA

Participação do setor na economia brasileira cai e volta ao nível dos anos JK

Participação da indústria de transformação no PIB, em %



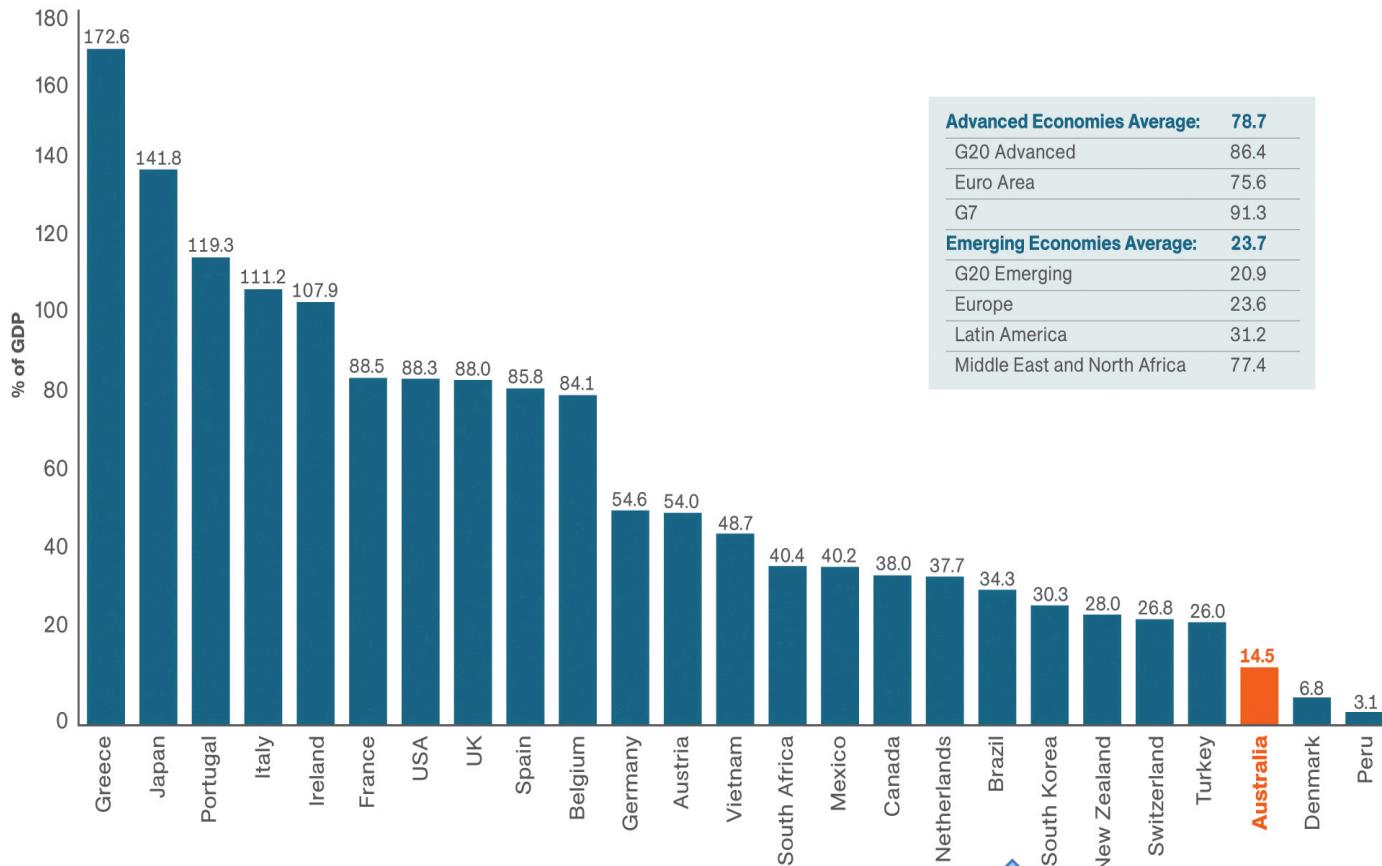
Evolução da Dívida Pública



Fonte: BCB

Fonte: A. Tombini, Audiência Pública na CAE/Senado Federal em 24/03/2015.

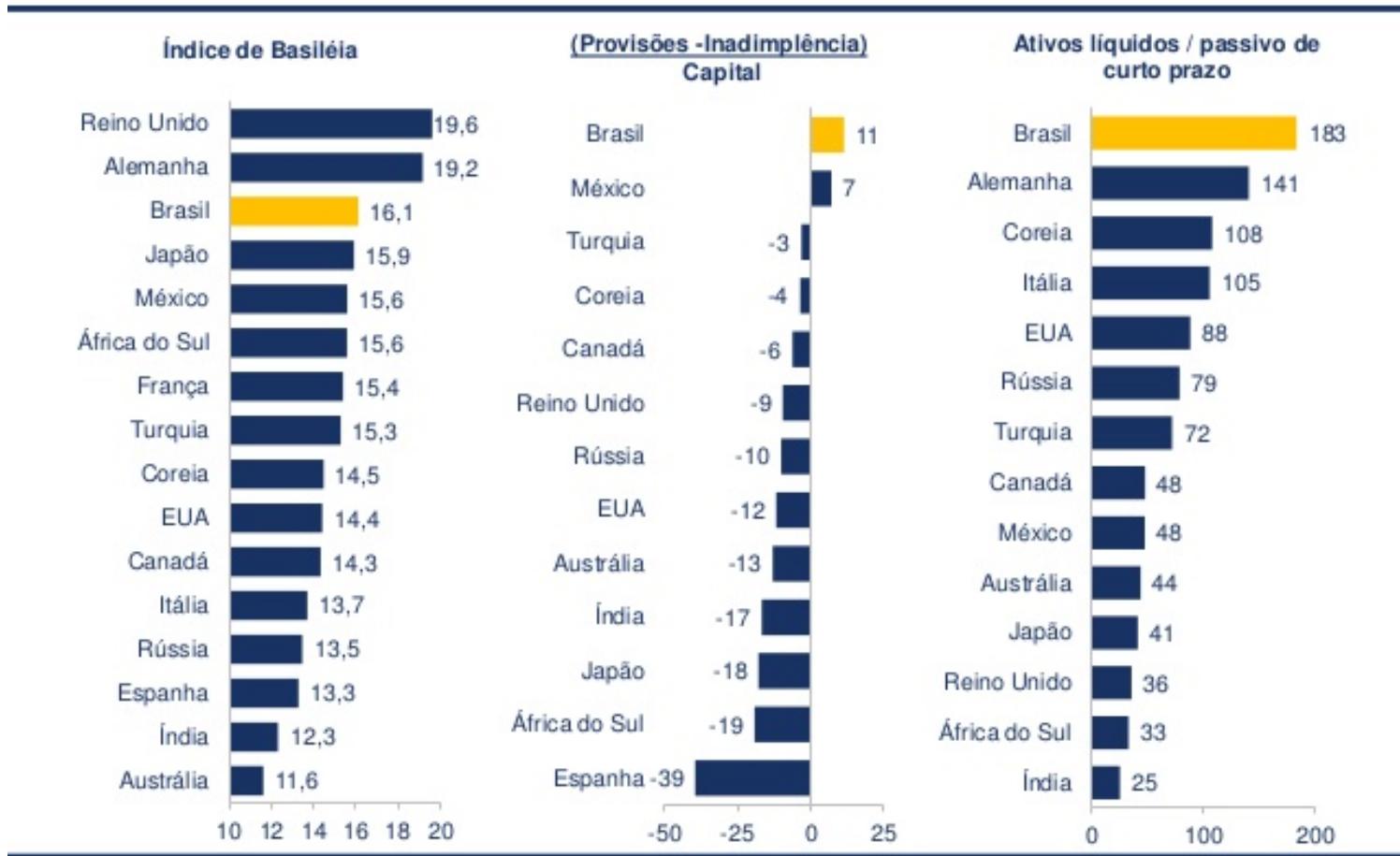
GENERAL GOVERNMENT NET DEBT¹ – 2014



1. International Monetary Fund (IMF) staff estimates and projections. Projections are based on staff assessment of current policies

Source: International Monetary Fund (IMF) Fiscal Monitor Database, October 2013, Statistical Tables 4 and 8; Austrade

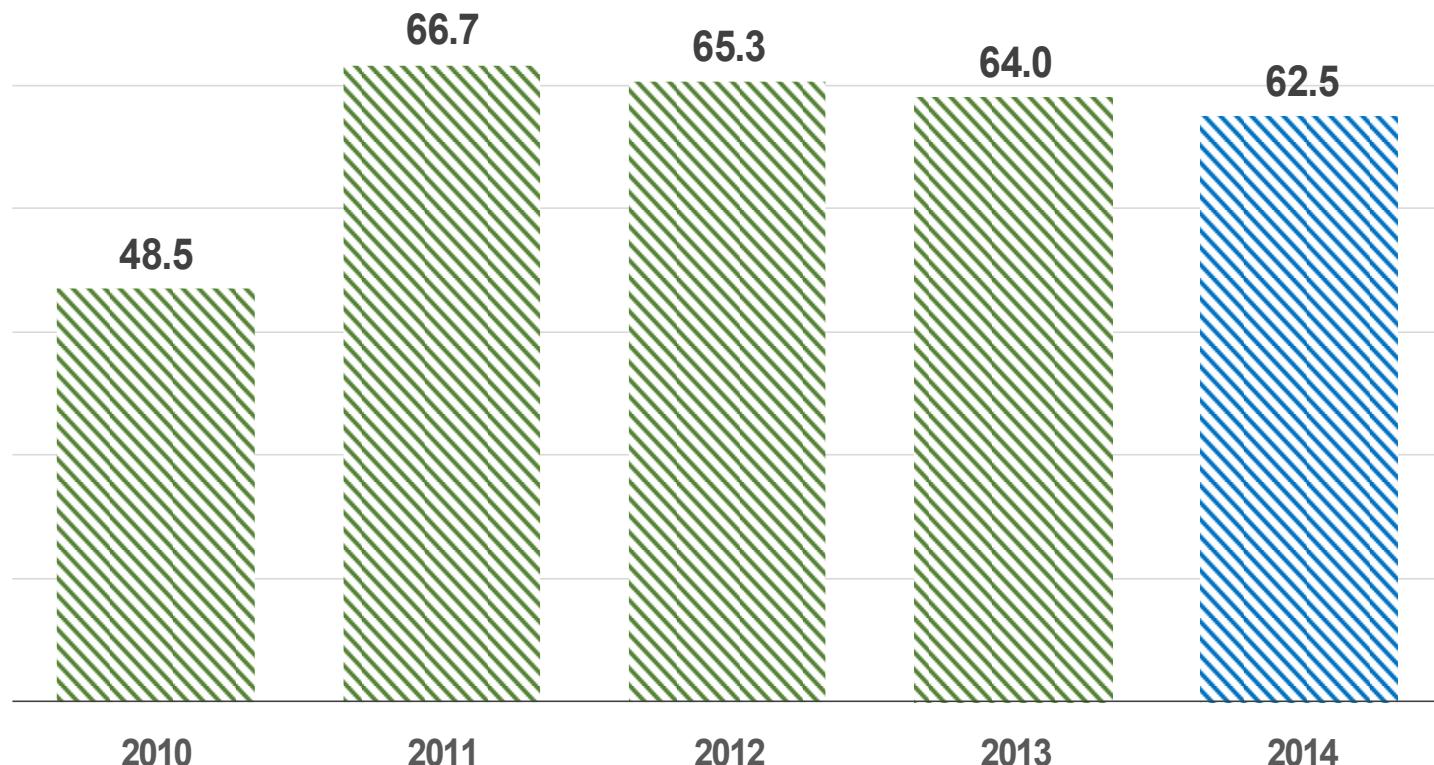
Indicadores de solidez financeira



Fonte: FMI (FSI – últimos dados disponíveis)

Fonte: A. Tombini, Audiência Pública na CAE/Senado Federal em 24/03/2015.

ANNUAL NET INWARD FDI (US\$ billion)

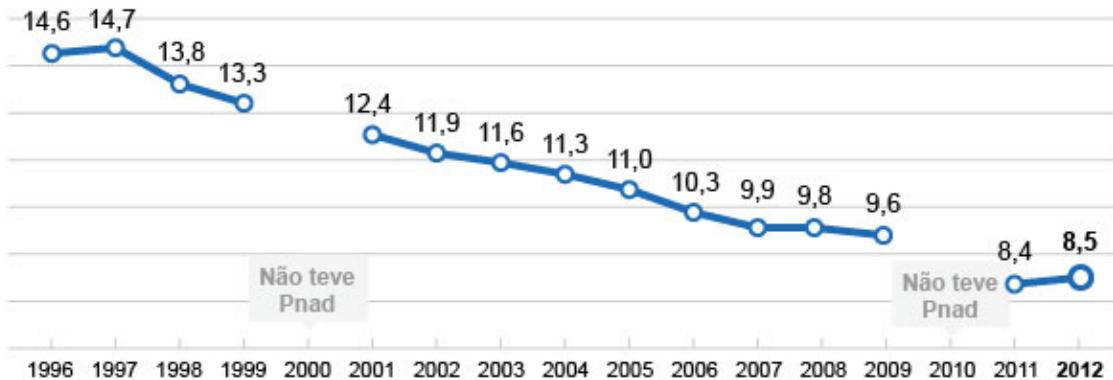


Analfabetismo no Brasil

% de pessoas com 15 anos ou mais de idade analfabetas

Taxa de analfabetismo

Houve estagnação na queda do número de analfabetos no Brasil. Há 300 mil novos analfabetos em relação à pesquisa de 2011

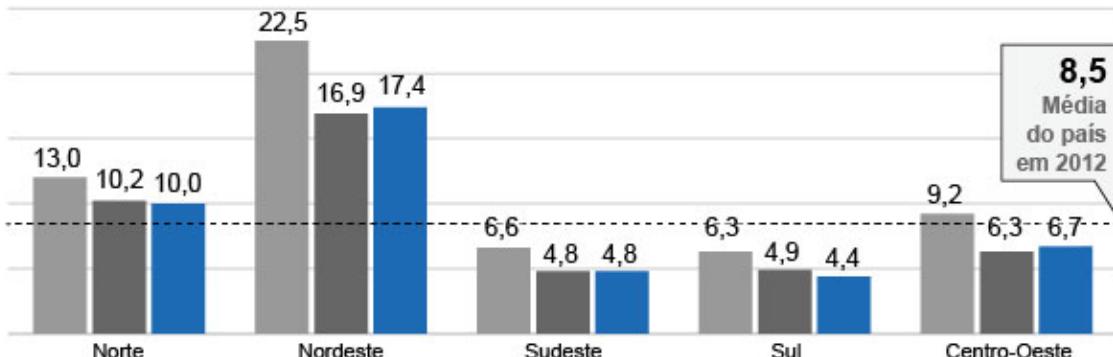


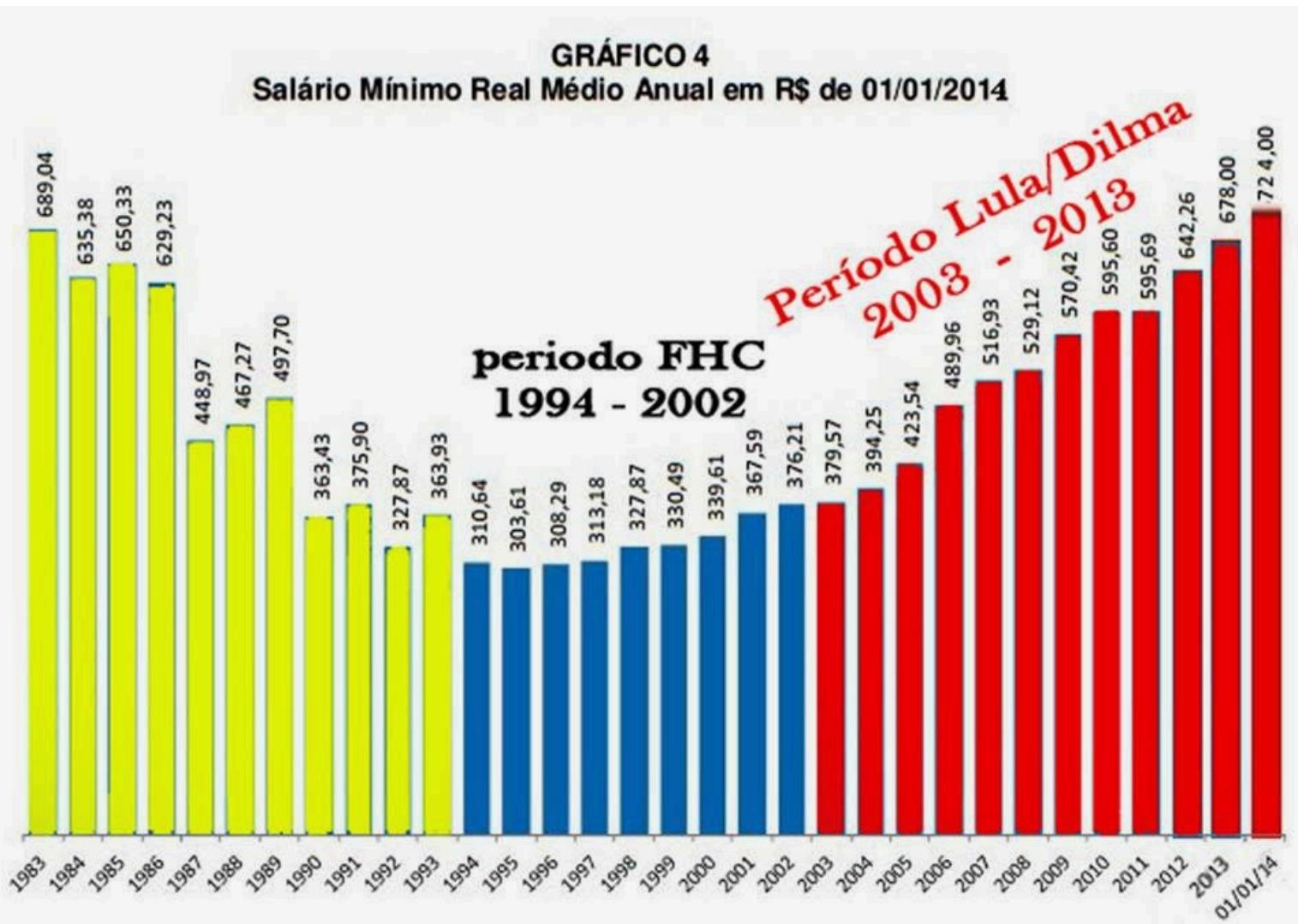
Analfabetismo por região

■ 2004

■ 2011

■ 2012

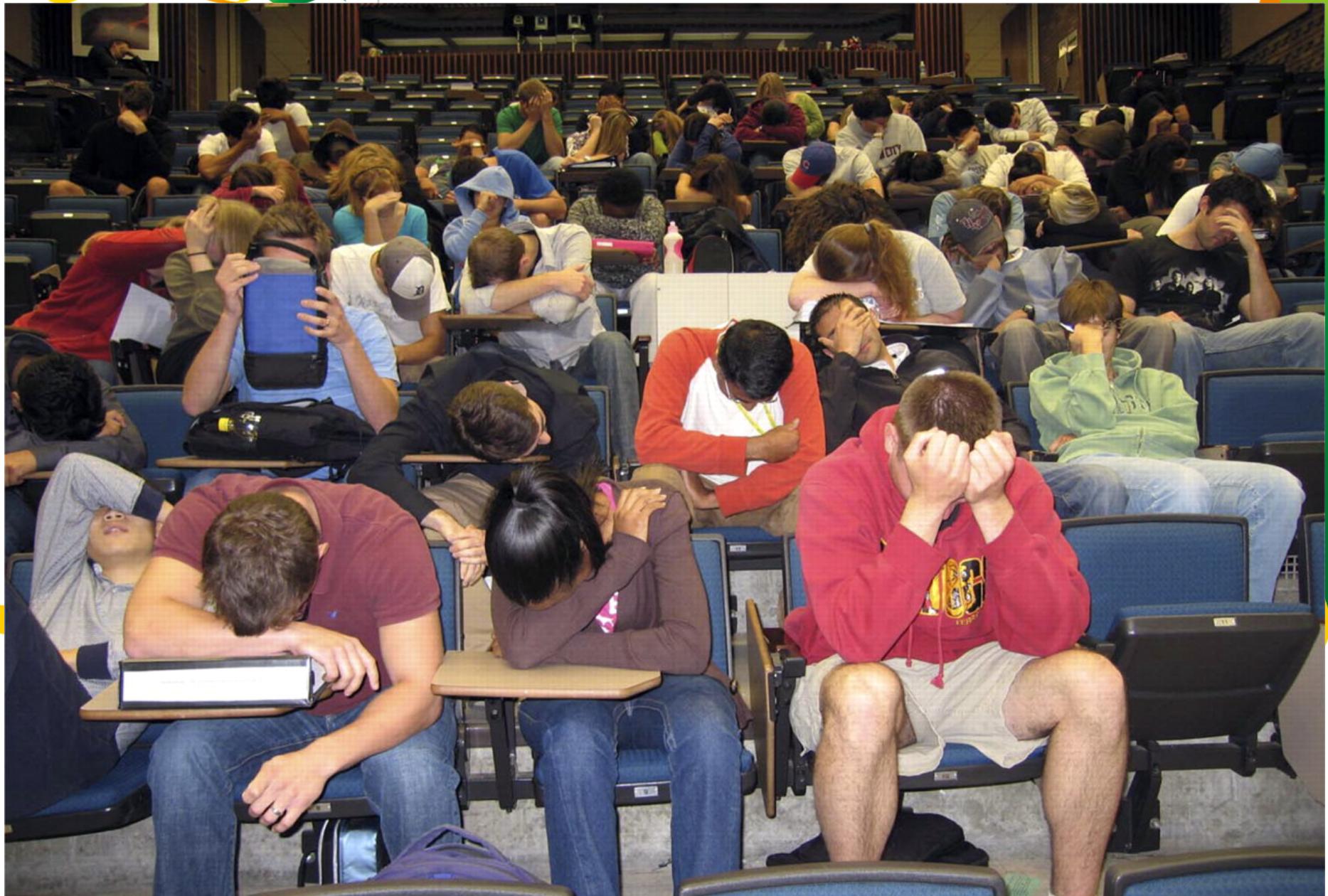




This crisis will end.
Competitive sectors, which
innovate, go on...

I Know, Stats are boring...

But please, pay attention



How the BRICS stack up

The Global Competitiveness Index 2014-2015

Global rank*

China	28
Russian Federation	53
South Africa	56
Brazil	57
India	71

Source: The Global Competitiveness Report 2014-2015

Note: * 2014-2015 rank out of 144 economies



Latin-America: Competitiveness



Latin America Top 10

The Global Competitiveness Index 2014-2015

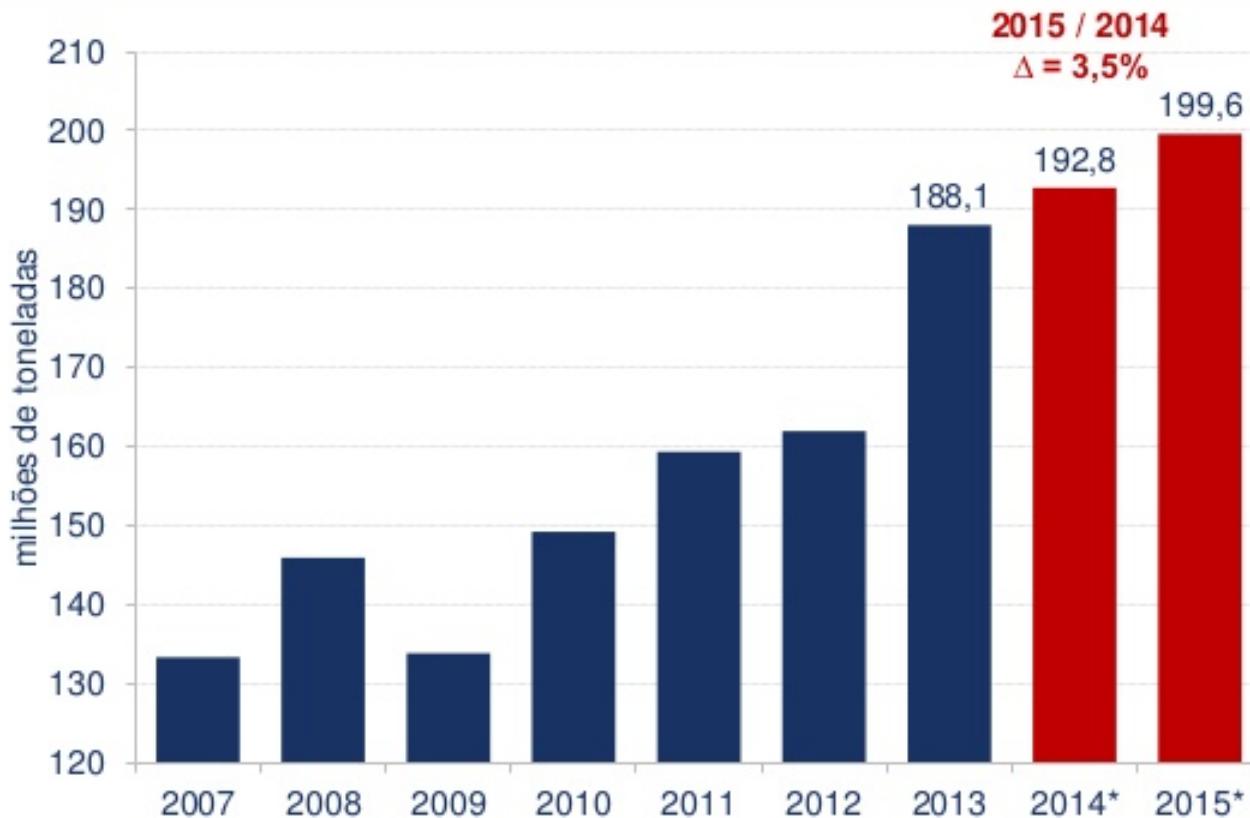
Global rank*

	Global rank*
Chile	33
Panama	48
Costa Rica	51
Brazil	57
Mexico	61
Peru	65
Colombia	66
Guatemala	78
Uruguay	80
El Salvador	84

Source: The Global Competitiveness Report 2014-2015

Note: * 2014-2015 rank out of 144 economies

Produção de grãos

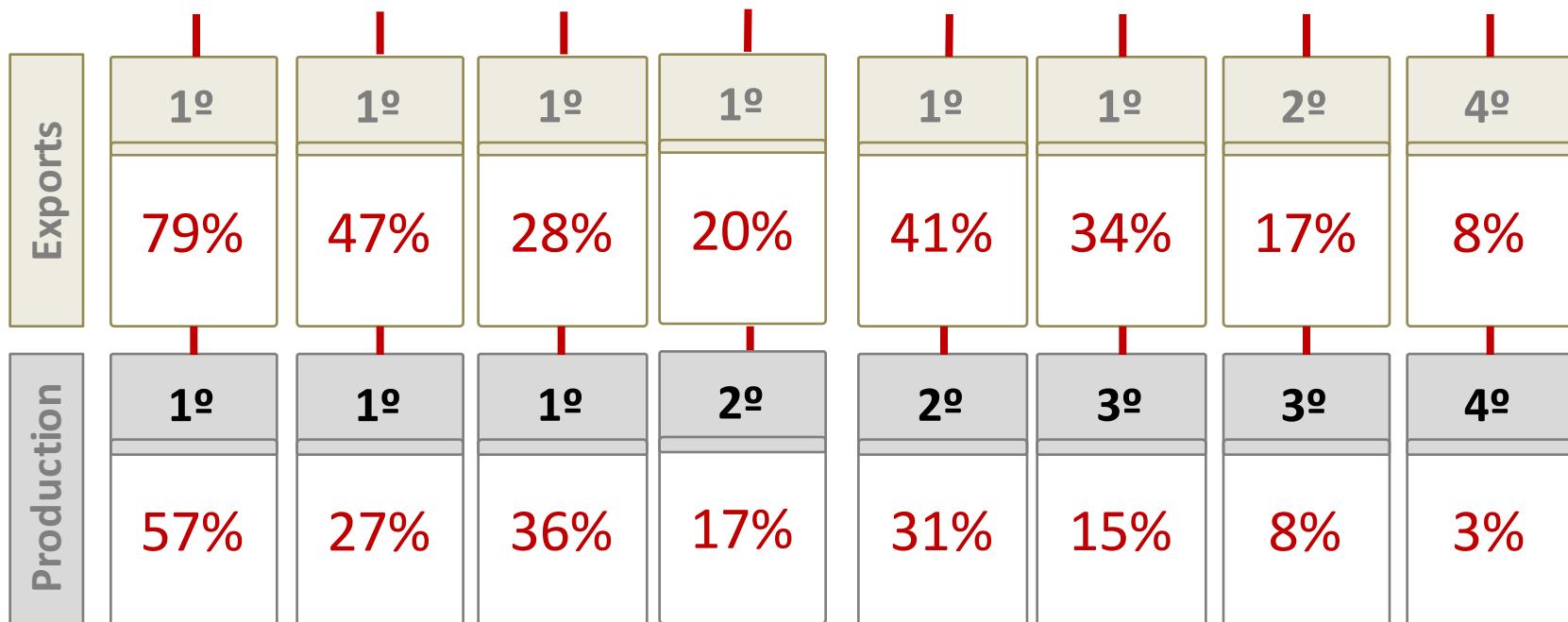


*estimativa em fevereiro de 2015

Fonte: IBGE (LSPA)

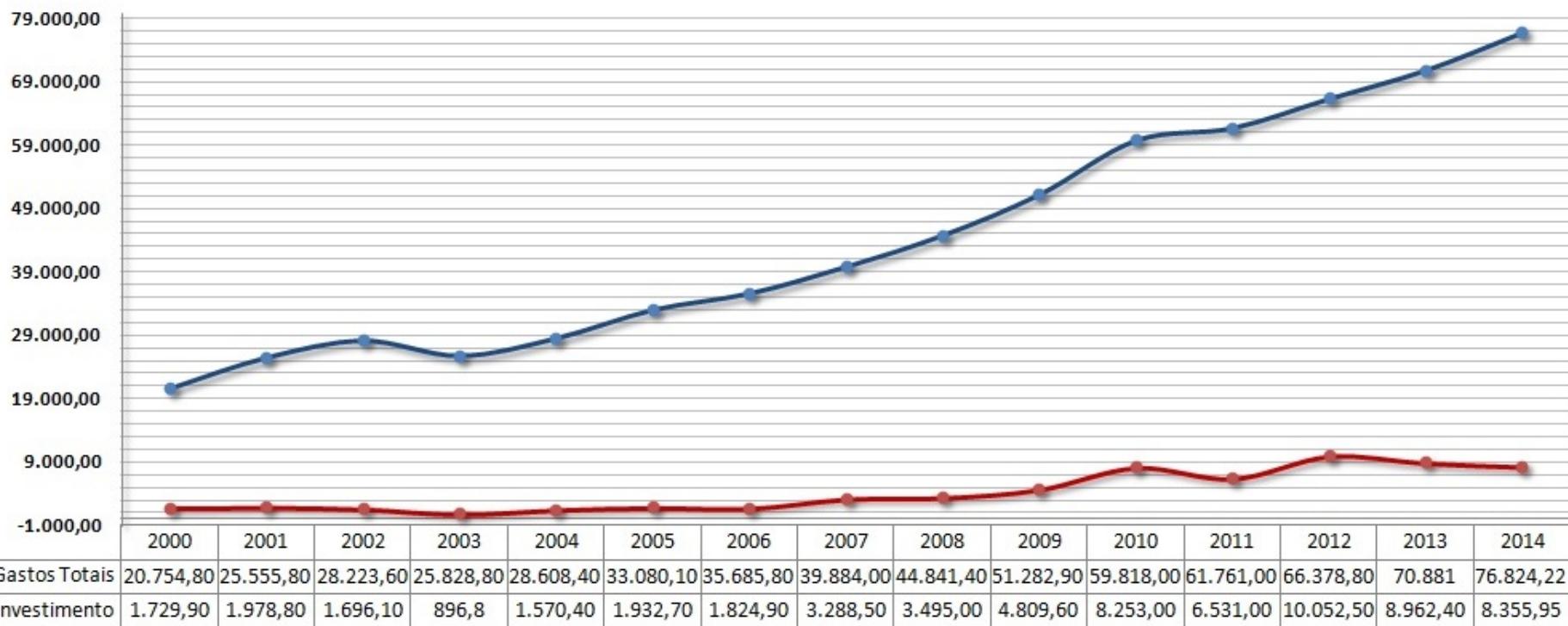
BANCO CENTRAL
DO BRASIL

23



The Defense sector in Brazil

EVOLUÇÃO DO ORÇAMENTO DE DEFESA - 2000 a 2014
(R\$ milhões)



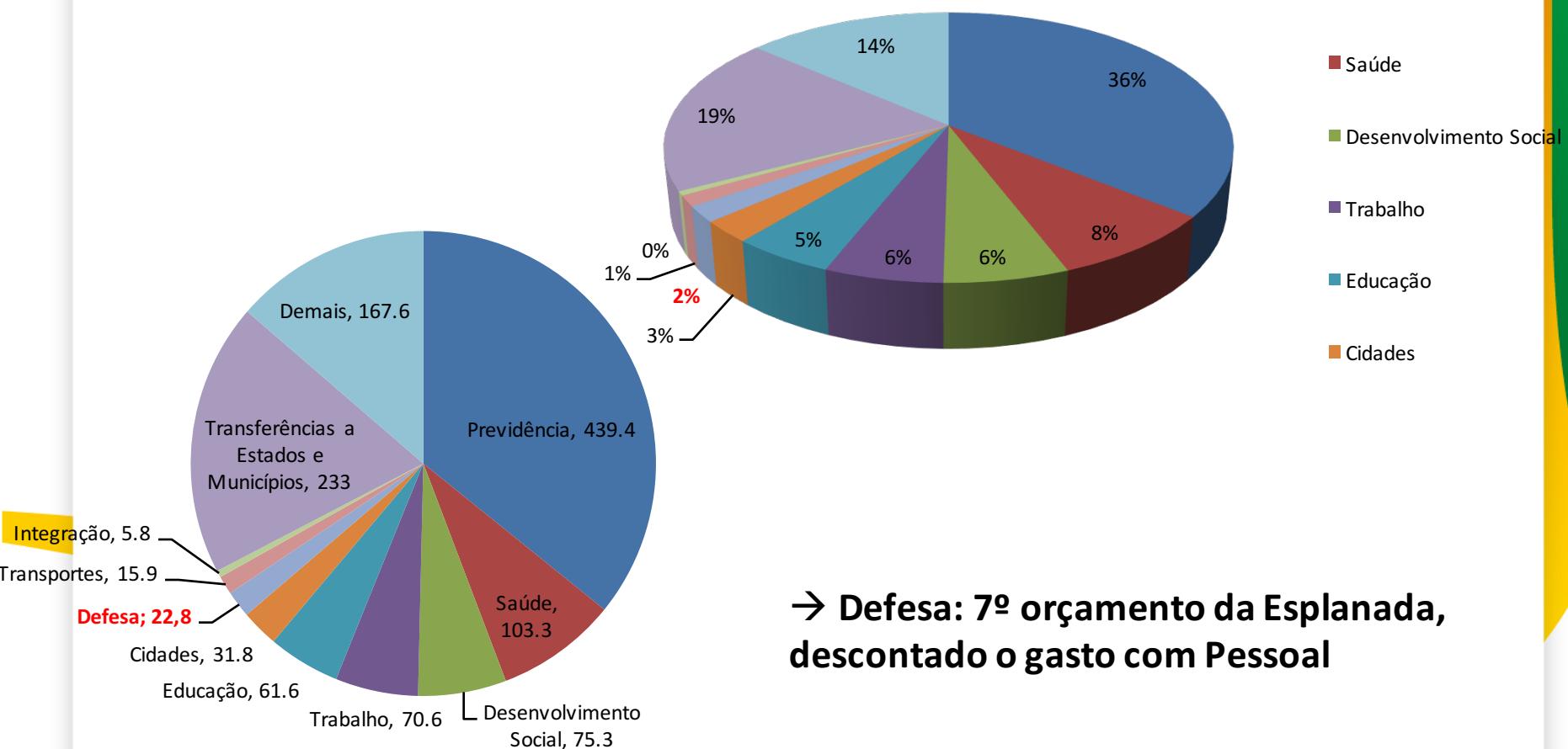
Fonte: MD/SEORI

ÓRGÃO	2014	%
Previdência	401,5	23,3
Saúde	100,3	5,8
Educação	92,4	5,4
Defesa	72,8	4,2
Desenvolvimento Social	68,4	4,0
Trabalho	67,9	3,9
Transportes	20,8	1,2
Encargos Financeiros/Operações de Crédito	451,3	26,2
Transferências Estados e Municípios	230,6	13,4
Demais	235,1	13,6
TOTAL	1.723,2	100,0

Expenditures per Ministry (Maintenance & Investments, R\$ bi)

ÓRGÃO	2014	%	PLOA 2015	%	LOA 2015	%
Social Security (Previdência)	390,8	35,3	439,4	39,4	439,4	35,8
Health	89	8	90,7	8,1	103,3	8,4
Social Development	68,5	6,2	75,4	6,8	75,3	6,1
Labor	62,1	5,6	51,9	4,7	70,6	5,8
Education	54,9	5	59,5	5,3	61,6	5,0
Cities/ Interior (Cidades)	25,4	2,3	12,4	1,1	31,8	2,6
Defense	20,7	1,9	19,7	1,8	22,8	1,9
Transportation	17,3	1,6	15	1,3	15,9	1,3
National Integration	8,2	0,7	4,7	0,4	5,8	0,5
Transfers to States & Municipalities	225,1	20,3	235,3	21,1	233,0	19,0
Other	60,5	5,5	110,2	9,9	167,6	13,7
TOTAL	1.106,90	100	1.114,20	100	1.227,1	100,0

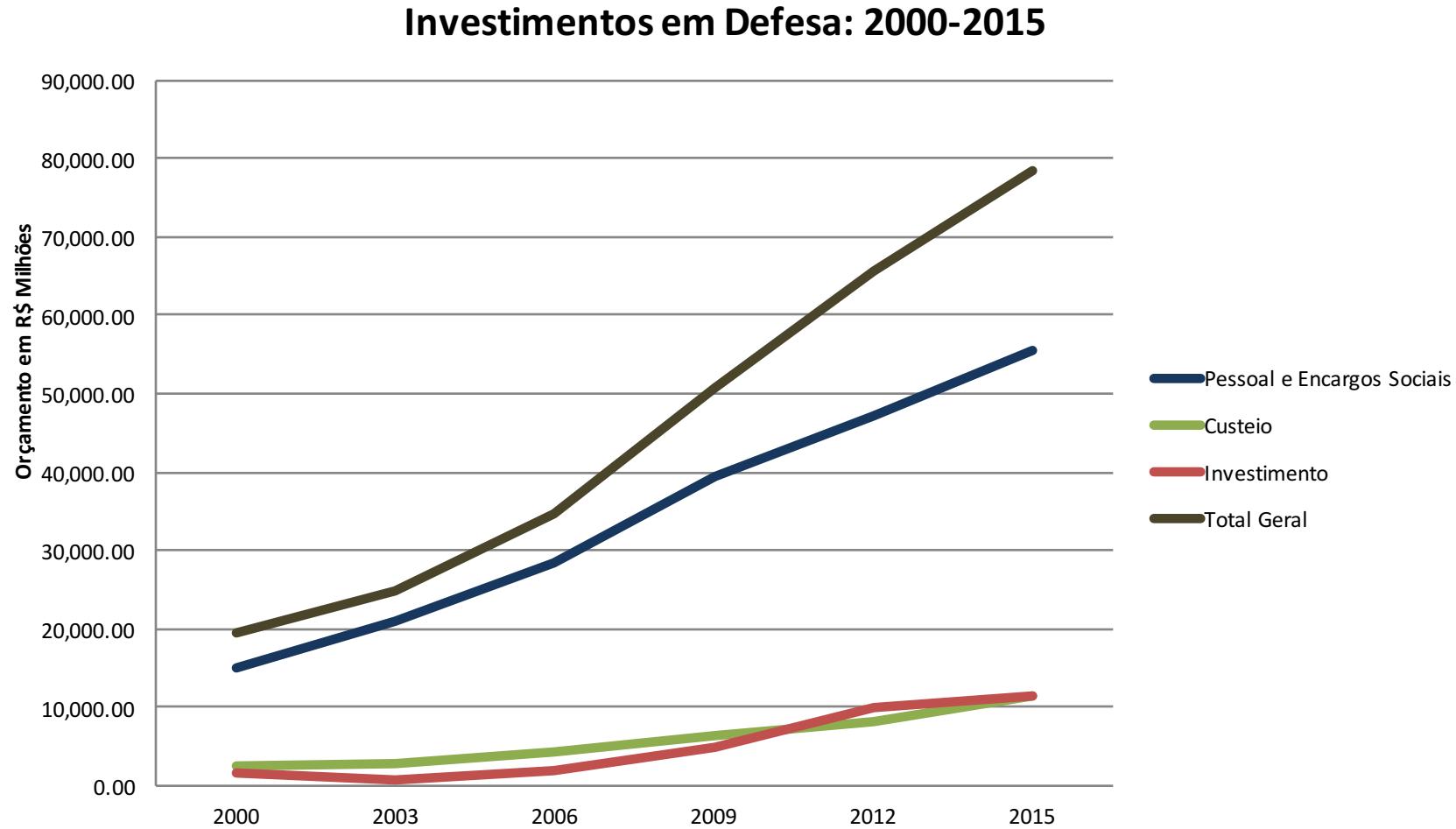
Pandiá Expenditure per Ministry – Union, All Powers (Maintenance & Investments, R\$ bi)



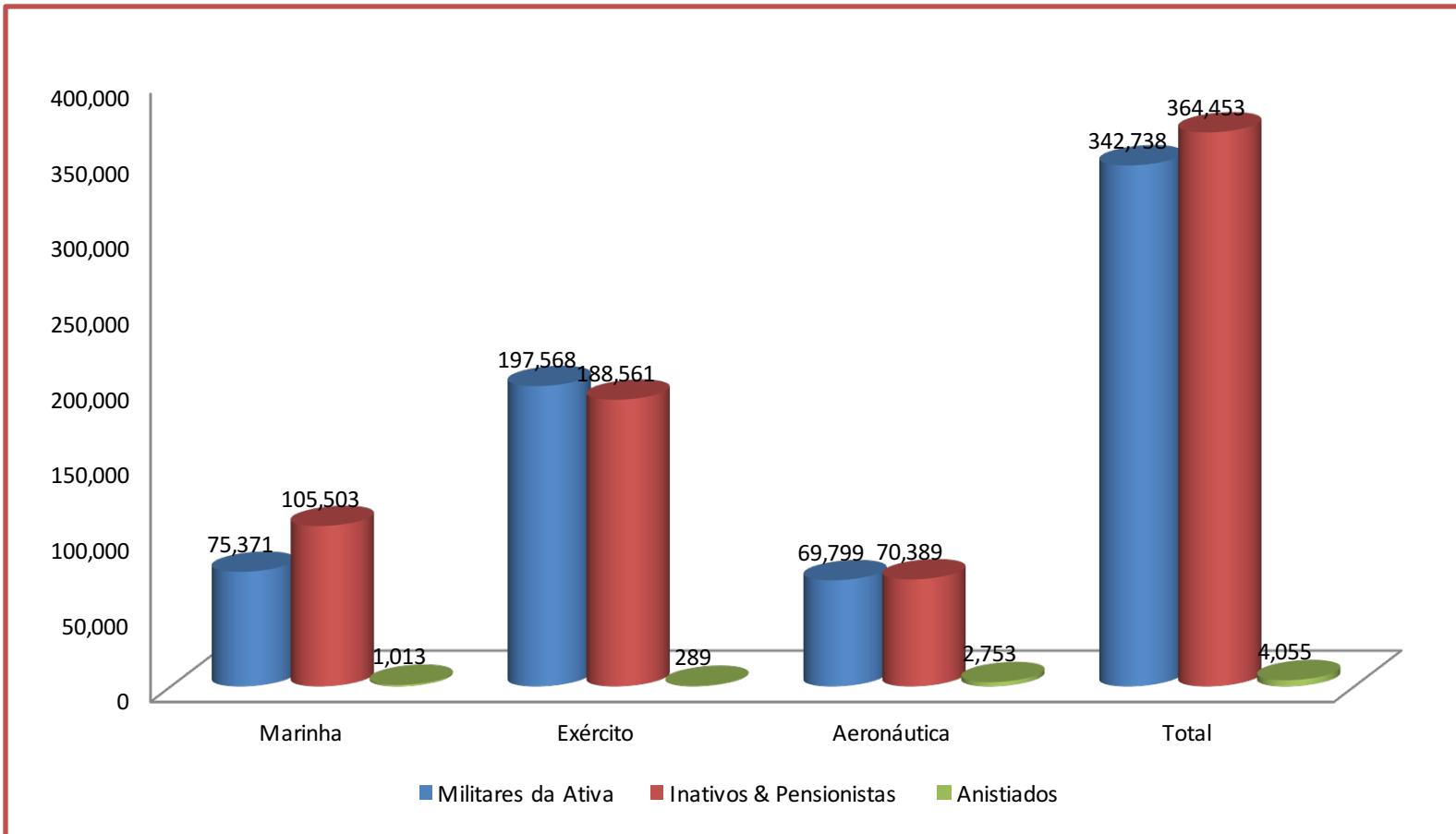
→ Defesa: 7º orçamento da Esplanada,
descontado o gasto com Pessoal

Fonte: Instituto Pandiá/MD - SG

Evolution of real expenditures (R\$ Mi)



Pandiá Personnel in the Armed Forces (Jan/2015)



Fonte: Instituto Pandiá/MD - Seori

Where does the money go? (R\$ bi)

SITUAÇÃO	FOLHA DE PAGAMENTO - 2014 (DESPESAS EXECUTADAS)		
	EFETIVO (*)	PAGAMENTO	%
		QTDE	R\$ MIL
ATIVOS	342.738	20.510.000	36,90%
INATIVOS	148.309	34.650.000	62,33%
PENSIONISTAS	216.144		
ANISTIADOS	4.055	430.000	0,77%
TOTAL	711.246	55.590.000	100%

% Folha de Pagamento em 2014

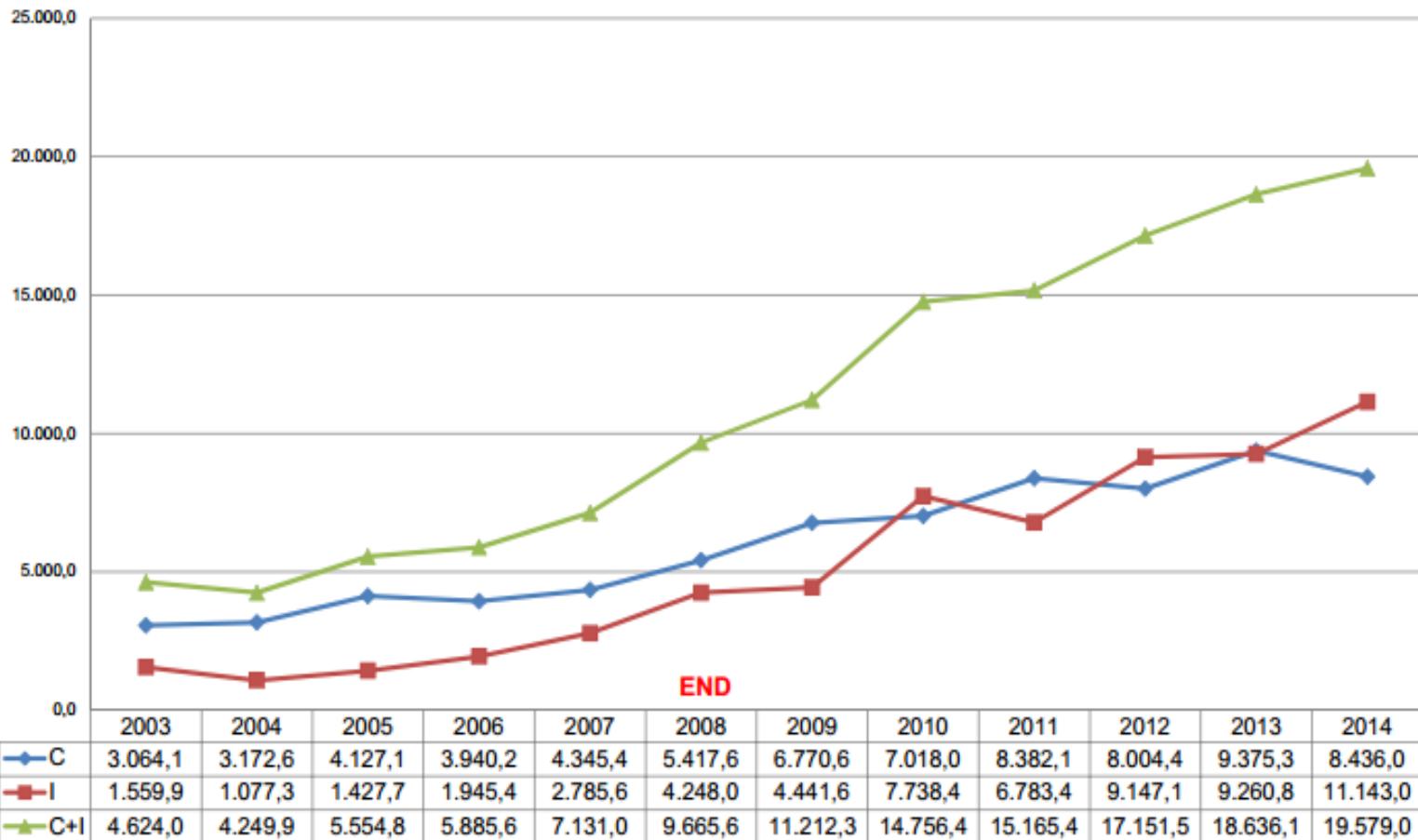


Fontes: * BRASIL. MD/SG/SEORI/DEORG/DIREM. Banco de Informações Estratégicas e Gerenciais (BIEG) – janeiro.

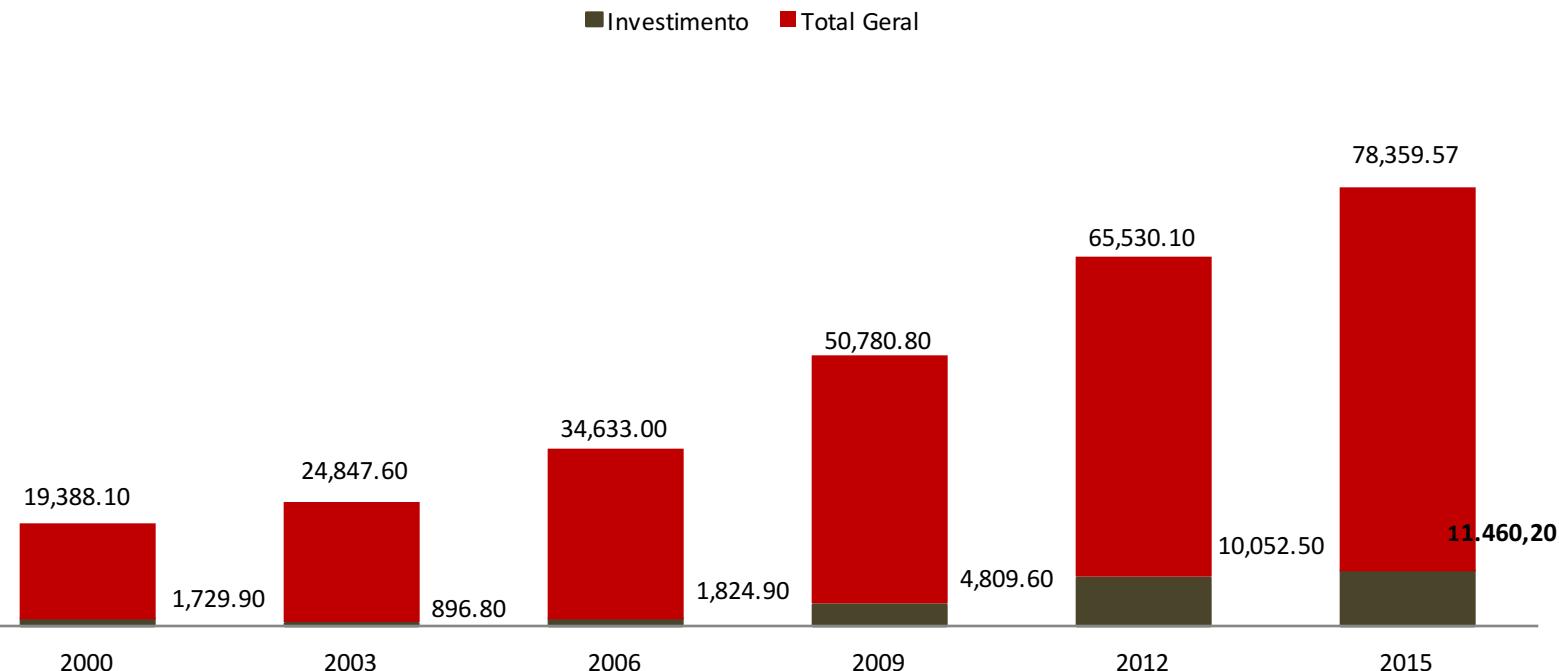
2015.

** Dados do SIAFI Gerencial (despesa de janeiro a dezembro de 2014).

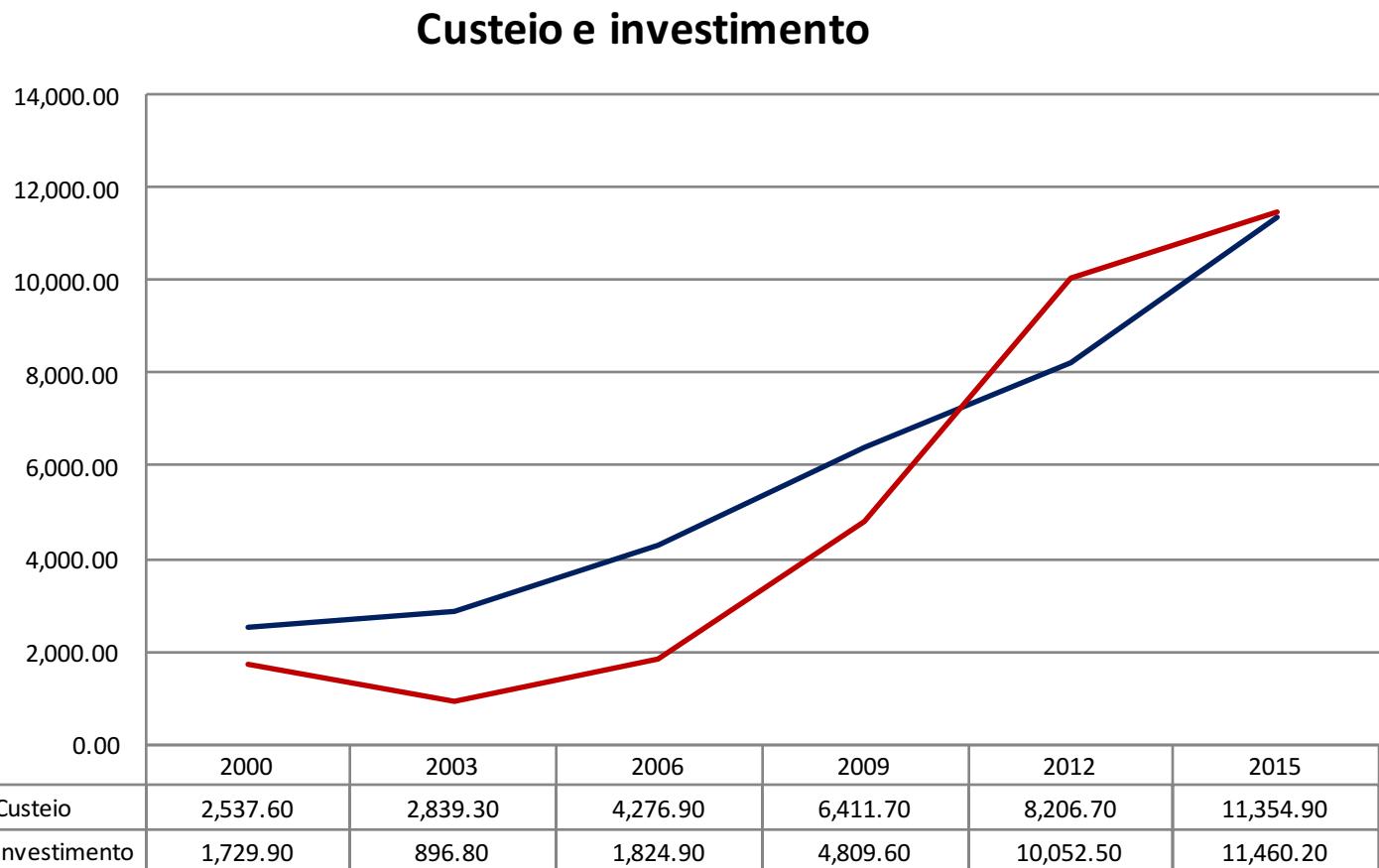
Expenditures in Maintenance & Investments 2003 -2014 (IPCA=81,8%)



Fonte: MD/SEORI

Ministério da Defesa: evolução orçamentária total e investimentos (R\$Mi)

Obs: o número de 2015 corresponde à previsão da PLOA



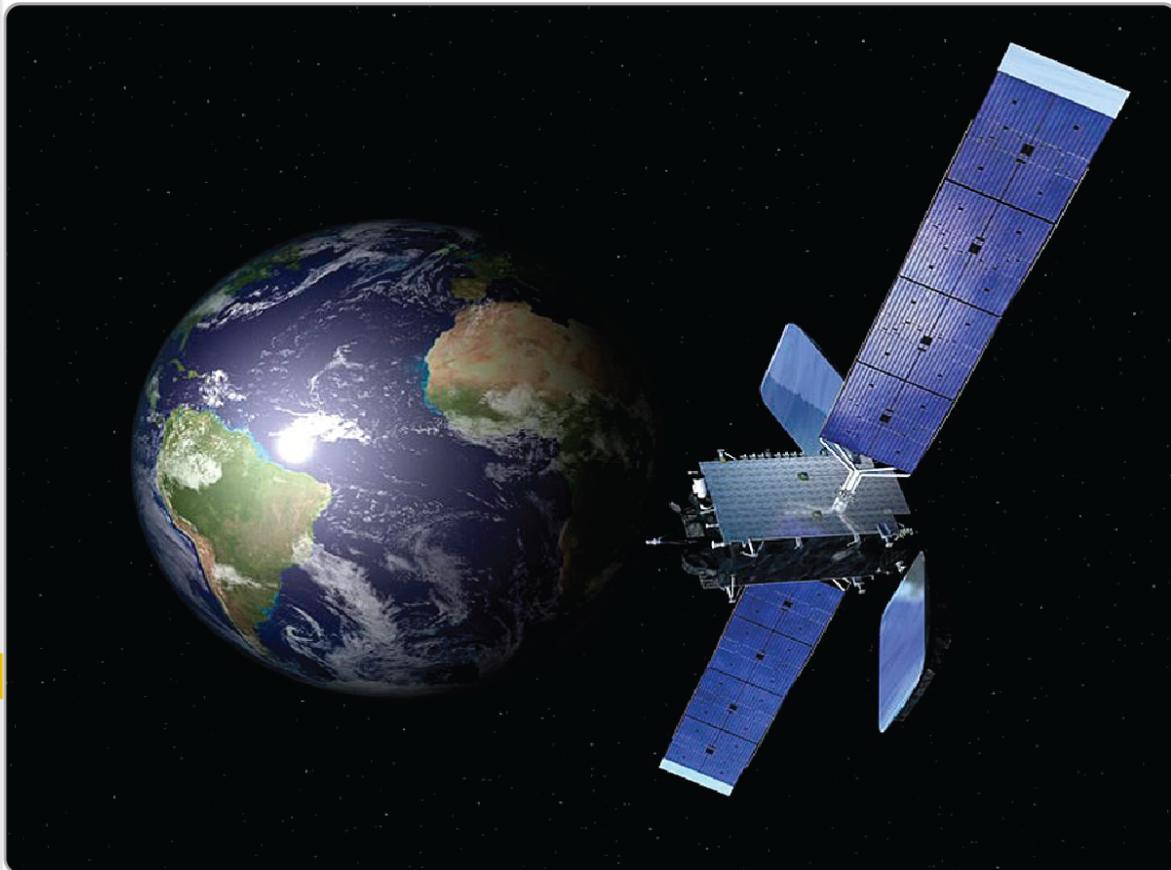
PAC Defesa 2015:

ÓRGÃO	R\$ Milhões
	PLOA 2015
Defesa	5.725,6
Administração - Projeto H-X BR	538,9
Aeronáutica - Aquisição de Caças FX-2	1.000,0
Aeronáutica - Aquisição do Cargueiro Tático Militar KC-390	400,0
Aeronáutica - Projeto Desenvolvimento KC-X	771,0
Exército - Blindados Guarani	200,0
Exército - SISFRON Total	285,0
Exército - Sistema de Defesa Estratégico ASTROS 2020	90,6
Marinha - PROSUB	1.771,7
Marinha - Tecnologia	316,4
Satélite Geostacionário de Defesa e Comunicação SGDC	352,1

Strategic projects



Geostationary Satellite SGCD

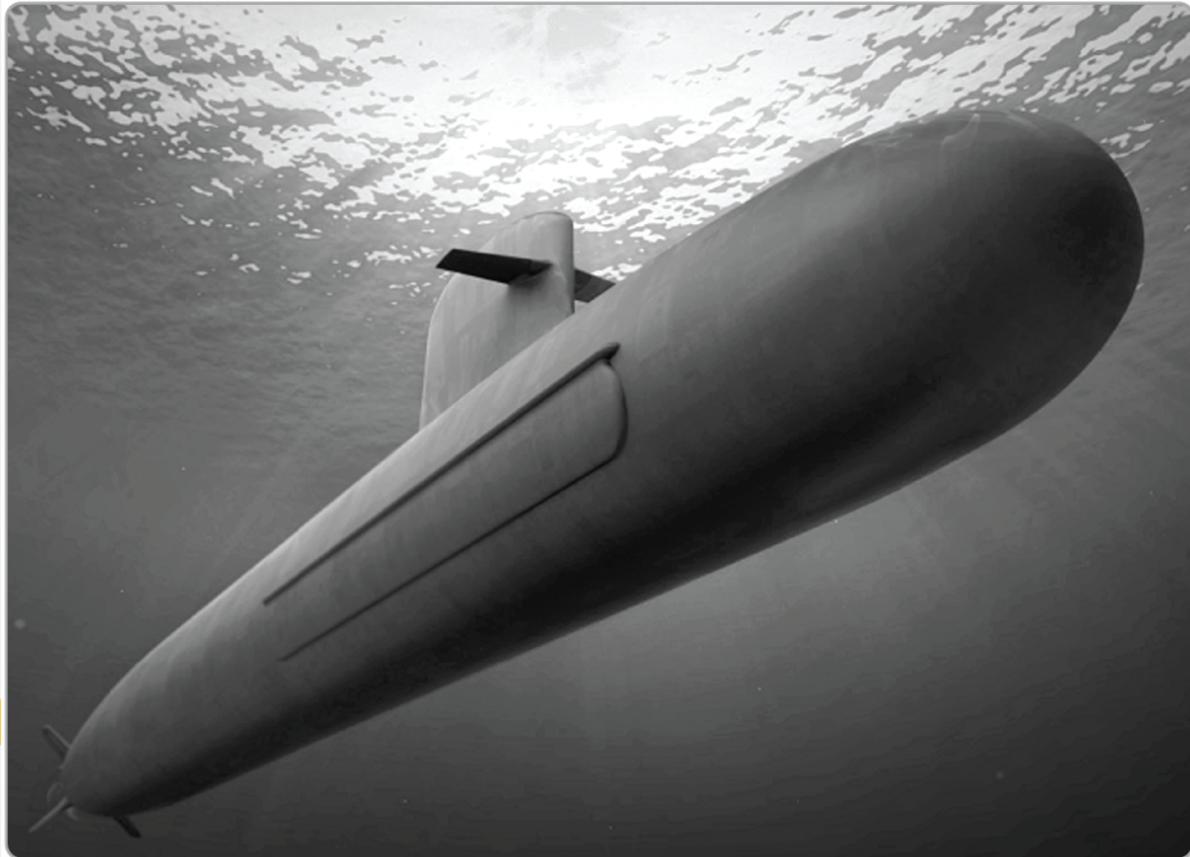


VALOR TOTAL DO PROJETO:

R\$ 1,7 bilhão

VALOR DO MD:
R\$ 489 milhões

PREVISÃO DE TÉRMINO EM 2017



VALOR TOTAL:

R\$ 31 BILHÕES

PREVISÃO DE TÉRMINO EM 2025

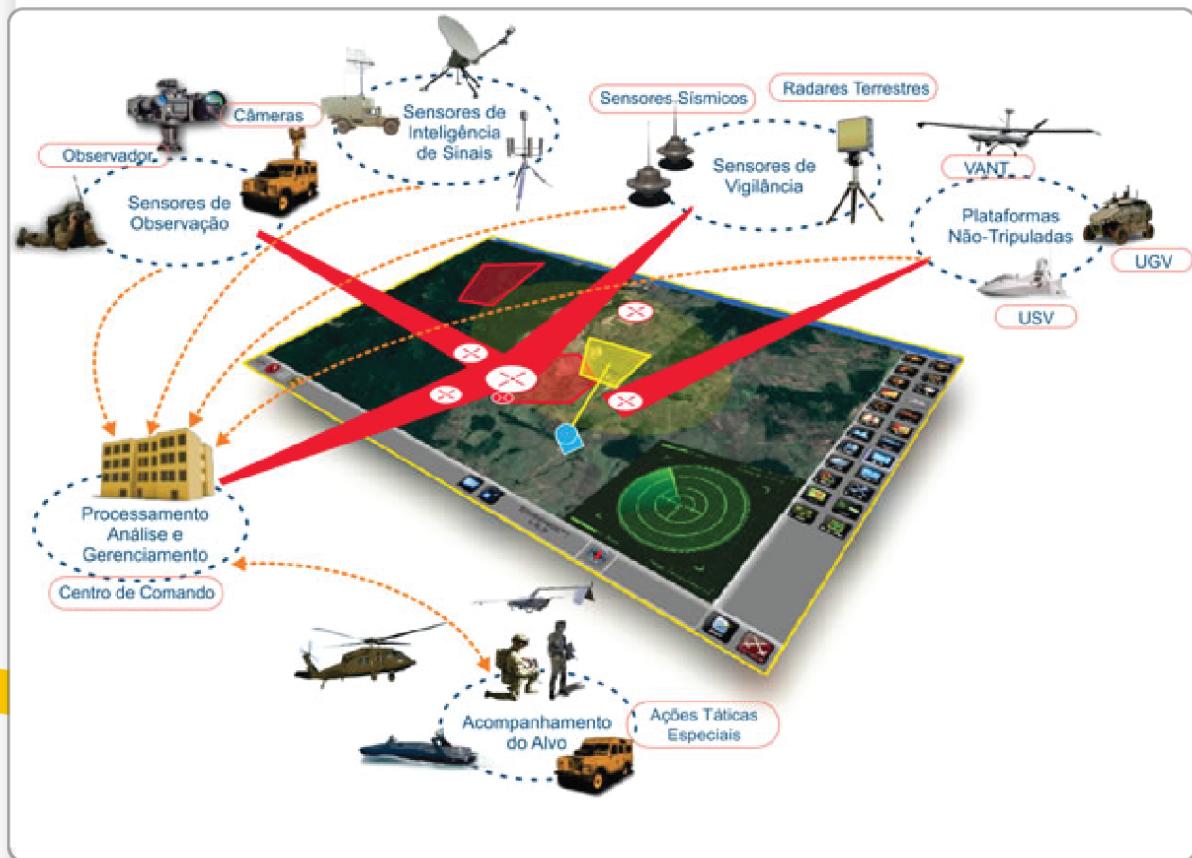
Navy's NUCLEAR Program



VALOR TOTAL:

R\$ 5 BILHÕES

PREVISÃO DE TÉRMINO EM 2030



VALOR TOTAL:

R\$ 11 BILHÕES

PREVISÃO DE TÉRMINO EM 2035

Wired Amazon



OBJETIVO:
Implantar uma
infovia de 7,8 mil
km, utilizando
cabos subfluviais
nos rios da Bacia
Amazônica.

→ Conectividade
até locais de
difícil acesso

GUARANI



VALOR TOTAL:

**R\$ 20,8
BILHÕES**

PREVISÃO DE TÉRMINO EM 2035

FX-2 GRIPEN



VALOR TOTAL:

R\$ 21 BILHÕES

PREVISÃO DE TÉRMINO EM 2024

KC-390



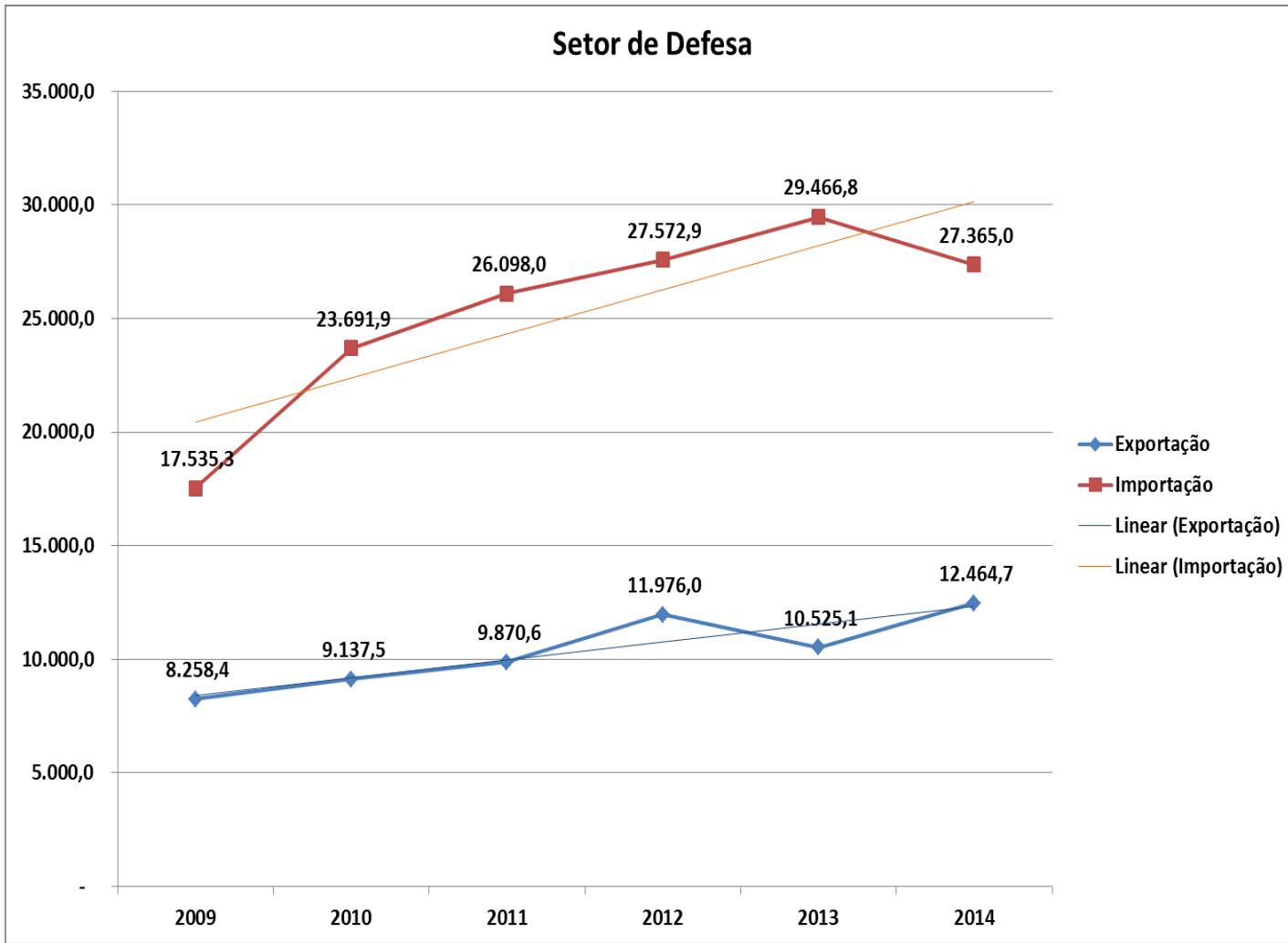
VALOR TOTAL:

**R\$ 12
BILHÕES**

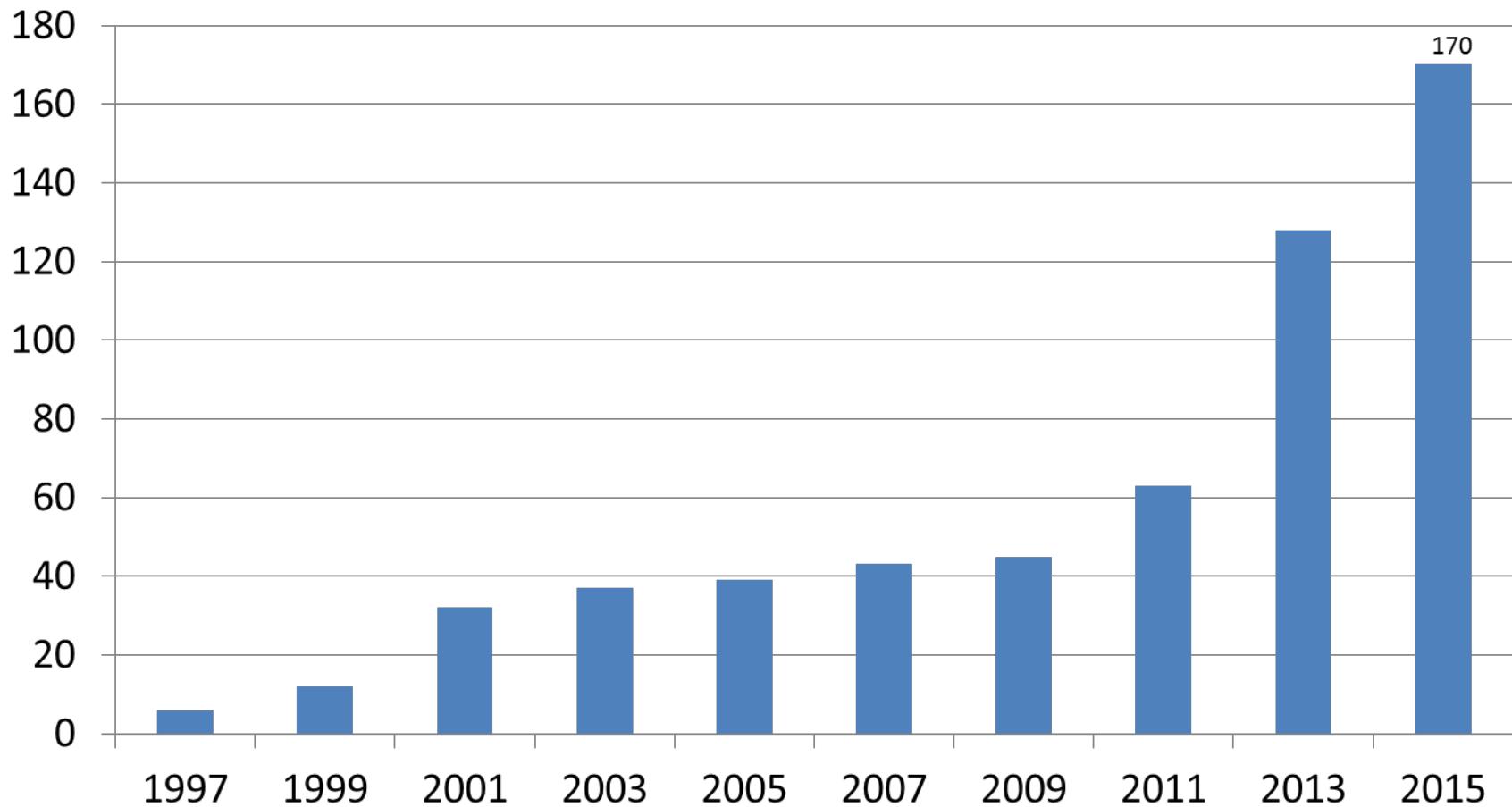
PREVISÃO DE TÉRMINO EM 2025

Some results

Defense in the Brazilian trade balance (2009-2014, US\$ Mi)



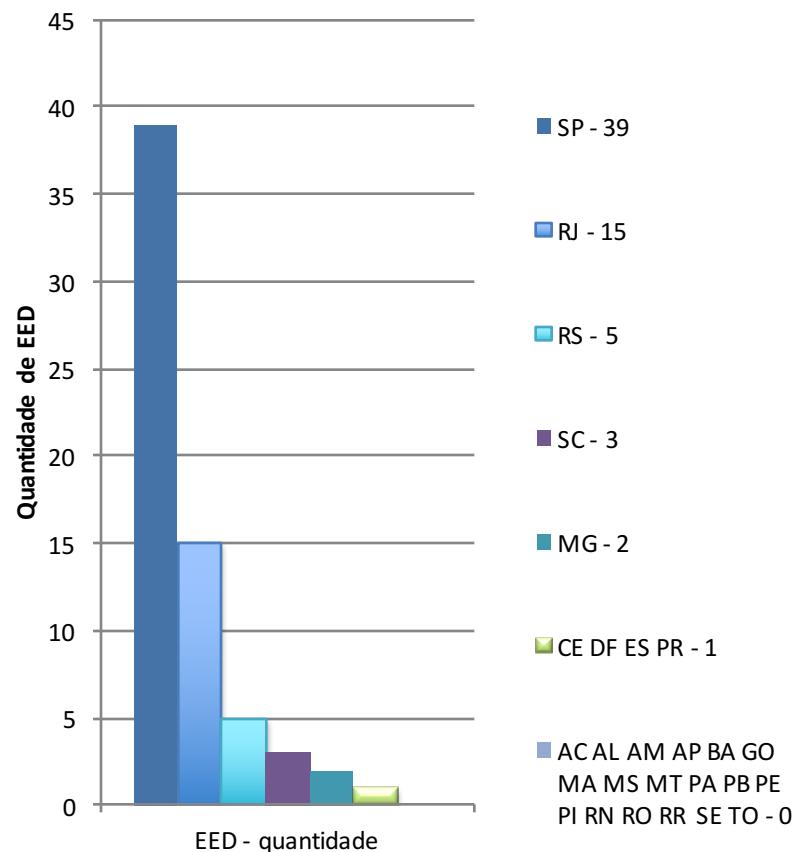
Delegações Oficiais



New rules for defense investments

Law 12.598: Number of firms considered strategic

- Expanding the Defense Industry
- Fiscal Inducements - RETID
- Supporting innovation
- Restructuring the relation between tech institutes (IME e ITA) & firms
- Jobplaces: From 4,000 in 2007 to 7,000 in 2013 (ABINDE)



Fonte: Instituto Pandiá/MD

Investir em Defesa é investir no Brasil



\$1,5
TRILHÃO
MERCADO ESTIMADO POR ANO (EM DOLARES)



\$3
BILHÕES
GERADOS PELA INDÚSTRIA DE DEFESA NO BRASIL POR ANO (EM DOLARES)



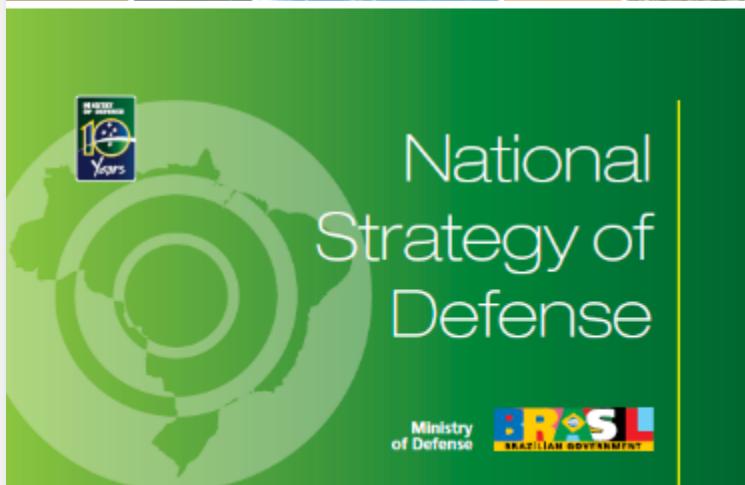
30 MIL
EMPREGOS DIRETOS GERADOS



40 MIL
NOVOS POSTOS DE TRABALHO NO BRASIL ATÉ 2020

(Dados da ABIMDE)

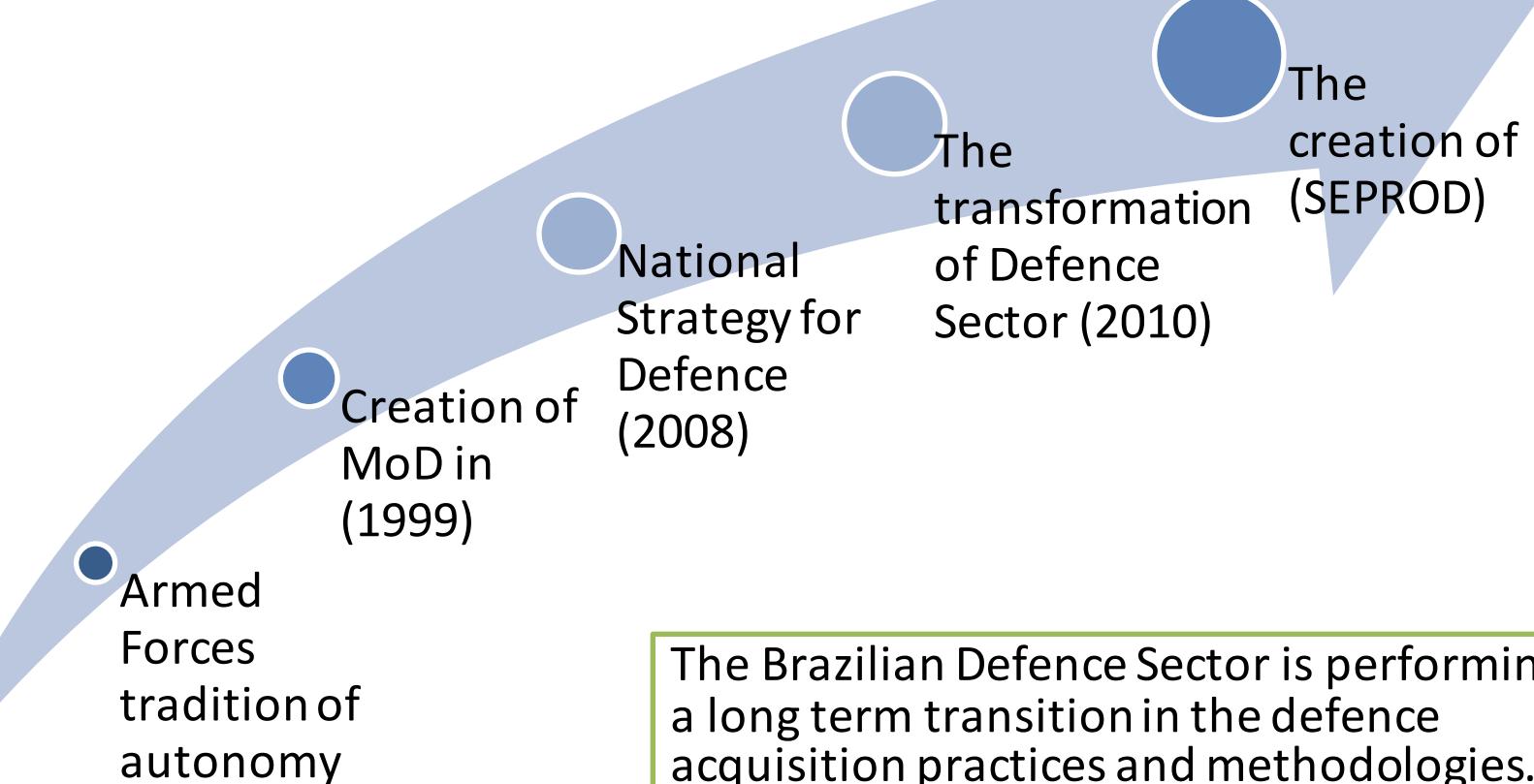
Organisational structure



Leverage of Defence Industry

- Brazilian defence industry is intended to ensure that the equipment needs of the Armed Forces are based on technologies that are domestically mastered.
- Strategic Sectors: Nuclear, Spatial and Cybernetic

Brazilian Defence Sector Historical perspective



The Brazilian Defence Sector is performing a long term transition in the defence acquisition practices and methodologies.

Organisational Structure

Minister of Defence

Secretariat General

EMCFA
Joint
Staff

Navy

Army

Air
Force

SEORI

SEPESD

CENSIPAM

Secretariat of
Defence Products
(SEPROD)

Department
of Defence
Products
(DEPROD)

Department
of Industrial
Technology
(DECTI)

Department
of
Cataloguing
(DECAT)

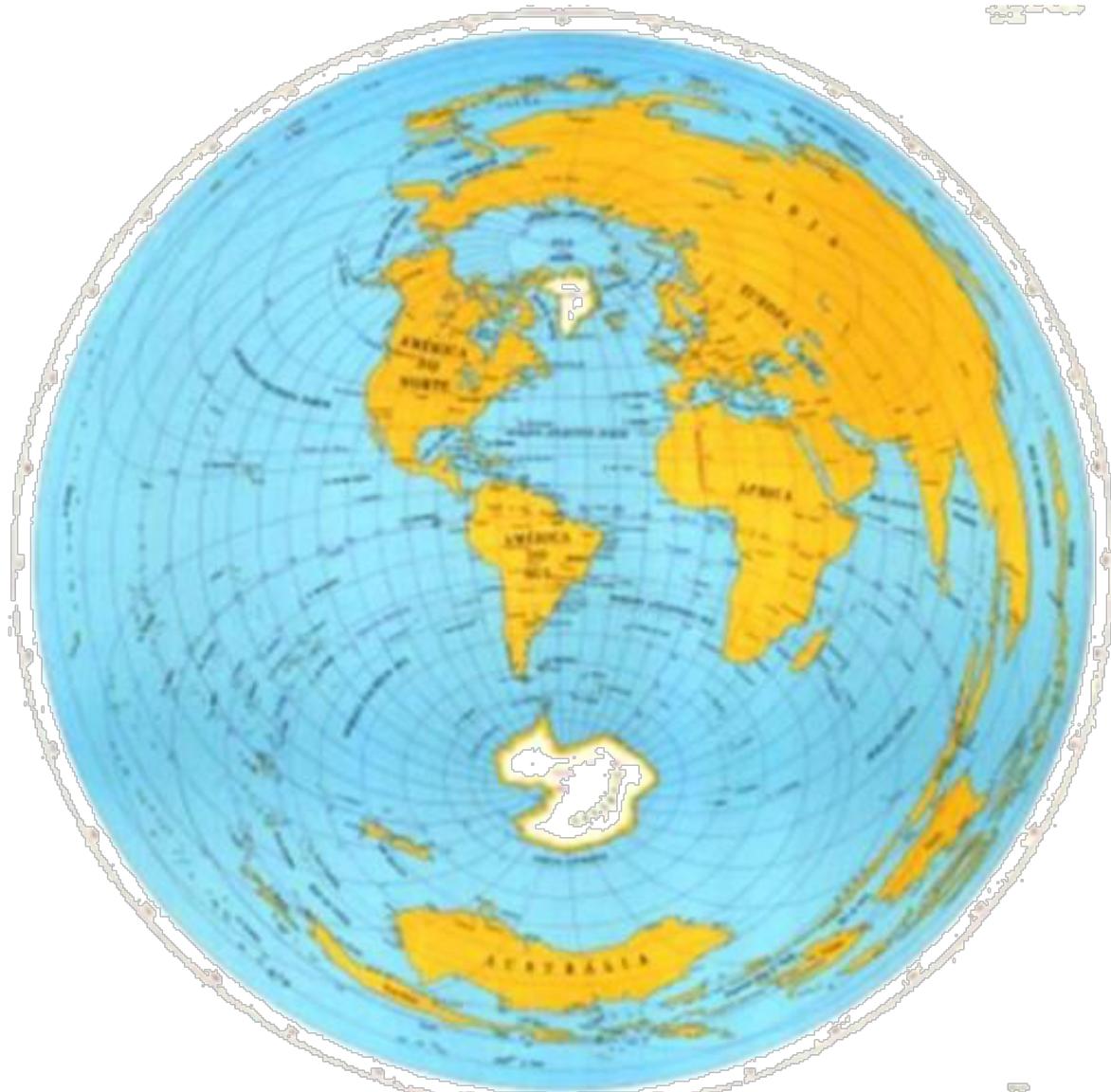
EMCFA: JOINT STAFF OF ARMED FORCES

SEORI: SECRETARIAT OF INSTITUTIONAL COORDINATION AND ORGANIZATION

SEPESD: SECRETARIAT OF PERSONAL, EDUCATION, HEALTH AND SPORTS

CENSIPAM: MANAGEMENT AND OPERACIONAL CENTRE FOR THE AMAZON PROTECTION SYSTEM

Geopolitical and strategic context



Huge areas to protect or to defend. Amazon and Blue Amazon.

Natural resources: water, biodiversity, energy, food...

Defined borders and jurisdictional waters.

Challenging social inequality.

New and *hybrid* threats.

“Global player” aspirations.

Complex and fast changing world.

Demands for defence and dissuasion capability.

Force Planning and Defence

Politics

Strategy

Force
Planning

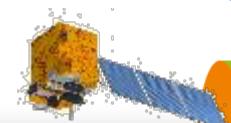
Strategic
Projects

“Defence White Paper”

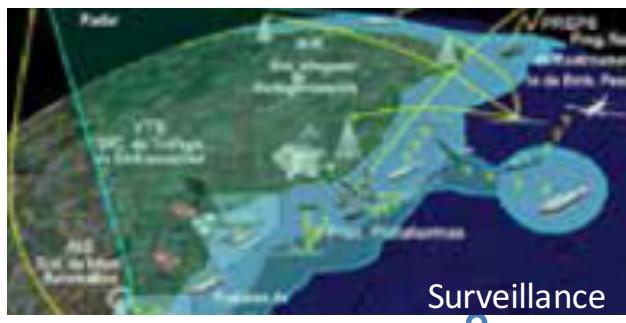


Technological Challenges

Space Program



Imagens: divulgação



Imagens: divulgação

Strategic Projects and the DIB

Technological demands (orders) from the defence sector are a major challenge.

which is reflected in an enclosed and competitive defence market.

The answer depends on the DIB, the degree of technological self reliance,

among other factors, ST&I-Def. conforms an international arena of power struggle,

its determination to overcome obstacles and pursue innovation...

For emerging countries, the DIB requires an extraordinary effort because...

Final considerations

The challenge of the long term planning in the current S&T evolution pace.

The limitations and risks of the "technological determinism".

The importance of a "defence acquisition system"...

Between the list of needs and the acquisition of the military assets there may be a large distance...

Defence procurement can leverage the industry self reliance, but can also cause more dependence from abroad.

The force planning process requires the S&T feasibility to be continuously considered since the beginning.

It also requires taking into account the defence acquisition system dynamics and its intrinsic limitations.

It is inherent to the highest political levels the responsibility for the choices and risks of technological options.