

Special Report

Small Arms in Brazil: Production, Trade, and Holdings

By Pablo Dreyfus, Benjamin Lessing, Marcelo de Sousa Nascimento, and Júlio Cesar Purcena



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*By Pablo Dreyfus, Benjamin Lessing, Marcelo de Sousa Nascimento,
and Júlio Cesar Purcena*



A study by the Small Arms Survey, Viva Rio, and ISER

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Viva Rio is a non-governmental organization headquartered in Rio de Janeiro. Its main goal is to promote a culture of peace and social development through fieldwork, research, and the formulation of public policies. It was founded in December 1993 by representatives of different sectors of civil society as a response to growing violence in Rio de Janeiro. In recognition of the diverse nature of security matters, however, Viva Rio's area of interest has since expanded from the local to the regional and international levels. The organization seeks to raise awareness and affect change through community action, communication, and involvement in international activities concerning human security.

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- firearms—the main vector of the violence epidemic; and
- poor areas—favelas and impoverished suburbs that are in need of targeted social work within a framework of urban rehabilitation.

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ISER

Since its creation 35 years ago, ISER (Instituto de Estudos da Religião, or the Institute of Religious Studies) has been actively engaged in promoting development with social justice and environmental responsibility. Headquartered in Rio de Janeiro, Brazil, ISER most frequently partners with other NGOs, local governments, universities, agencies dealing with issues of religion or social development, churches, and, more recently, private companies motivated by corporate social responsibility.

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Contents

List of boxes and illustrations	14
List of abbreviations	19
About the authors	22
In memoriam: Pablo Dreyfus	23
Acknowledgements	24
Executive summary	27
Chapter 1. The Brazilian Small Arms Industry: Legal Production and Trade	
Pablo Dreyfus, Benjamin Lessing, and Júlio Cesar Purcena	30
Introduction	30
History of the small arms industry in Brazil	33
Findings: Brazil's small arms industry	39
<i>Producers</i>	39
<i>Production</i>	47
<i>Sales</i>	51
<i>The size of Brazil's small arms industry in context</i>	52
<i>Foreign trade</i>	54
Conclusion	64
Appendix 1: Sources and methodological obstacles	68
<i>Production and sales data</i>	69
<i>Foreign trade</i>	70
<i>Estimated total annual units produced by Taurus and CBC</i>	76
Endnotes	81

Chapter 2: Small Arms and Light Weapons Holdings in Brazil: Towards a Comprehensive Mapping of Guns and Their Owners	
Pablo Dreyfus and Marcelo de Sousa Nascimento	84
Introduction	84
Obstacles	85
<i>The regulatory framework</i>	85
<i>The regulations in practice</i>	87
Small arms in Brazil: distribution and holders	94
<i>Private (non-governmental) holdings</i>	95
<i>State holdings</i>	103
What the numbers reveal	130
Counting guns: distribution and holders	134
<i>Distribution of (legal and illicit) small arms by holding group</i>	135
<i>Holding groups at the state level</i>	142
Conclusion	148
Appendix 2: Questionnaires used during field research	150
Endnotes	154
Bibliography	158

List of boxes and illustrations

Boxes

- 1 Glock in Brazil?
- 2 Keeping the guns: the military police of Rio de Janeiro, São Paulo, and Paraná

Figures

- 1.1 Cooperation between the state and the private sector
- 1.2 Brazil: small arms exports by type in USD millions (2007 constant), 1982–2007
- 1.3 Forjas Taurus: estimated production of small arms, in thousands of units, 1983–2007
- 1.4 Net sales: Group Taurus vs. Forjas Taurus (small arms only) in BRL millions (2006 constant), 1986–2003
- 1.5 CBC: estimated production of ammunition in millions of rounds, 1987–2003
- 1.6 Brazil: small arms production in BRL millions (2006 constant), 1998–2005
- 1.7 Brazil: small arms production in BRL millions (2006 constant), 1950–85
- 1.8 Brazil: production of permitted-use firearms in Brazil, in thousands of units, 1967–95
- 1.9 Brazil: small arms production and sales in BRL millions (2006 constant), 1998–2005
- 1.10a Brazil: employment in the small arms and military equipment industry, 1996–2005
- 1.10b Brazil: employment in the small arms industry, 1996–2005

- 1.11 Latin America and the Caribbean: percentage of market share, by exporters of small arms, 2000–05
- 1.12 Forjas Taurus: net sales by market segment, 1983–2006
- 1.13 CBC: net sales by market segment, 1996–2006
- 1.14 Brazil: small arms exports by product, in USD millions (2007 constant), 1982–2007
- 1.15 Brazil: small arms exports, as percentage, by world region, 1982–2007
- 1.16 Brazil and Forjas Taurus: small arms exports to the United States, in USD millions (2006 constant), 1988–2006
- 1.17 Brazil: small arms exports to Latin America in USD millions (2007 constant) and percentage of total exports, 1982–2007
- 1.18 Brazil: destinations of firearms and parts exports by world region in USD millions (2007 constant), 1982–2007
- 1.19 Brazil: small arms ammunition exports by world region in USD millions (2007 constant), 1982–2007
- 1.20a Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 1982–89
- 1.20b Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 1990–99
- 1.20c Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 2000–07
- 1.20d Top ten importers of Brazilian-made ammunition in USD millions (2006 constant), 1982–89
- 1.20e Top ten importers of Brazilian-made ammunition in USD millions (2007 constant), 1990–99
- 1.20f Top ten importers of Brazilian-made ammunition in USD millions (2007 constant), 2000–07
- 1.21 Brazil: share of small arms in total exports, 1982–2007
- A1.1 Brazilian exports under 9303.30 vs. US imports under 9302, in USD millions (at current values), 1990–2007
- A1.2 Brazil: small arms, ammunition, and parts and accessories, in USD millions, 1996–2007
- A1.3 Brazil: small arms, ammunition, and parts and accessories exports by type in USD millions (2007 constant), 1982–2007

- A1.4 Brazil: small arms, ammunition, and parts and accessories exports (corrected) by type in USD millions (2007 constant), 1982–2007
- 2.1 'Ideal SINARM' (1997)
- 2.2 Universe of study: holding groups
- 2.3 Distribution of small arms holdings per group
- 2.4 Small arms holdings in Brazil (16,990,200)
- 2.5 Legal holdings (7,490,300)
- 2.6 Illicit holdings (9,499,900)
- 2.7 Private civilian legal holdings (4,125,500)
- 2.8 Legal small arms privately held by military and state military police personnel and collectors, hunters, and sports shooters (1,245,000)
- 2.9 Collectors, hunters, and sports shooters (212,600)
- 2.10 State holdings (2,119,500)

Tables

- A1.1 HTS sub-headings
- A1.2 Brazilian exports, 1997–2002
- A1.3 US imports for consumption, 1997–2002
- A1.4 The USD 500,000 hunting rifle
- A1.5 Suspected non-small arms line items removed from small arms export totals, USD current
- A1.6 Estimated total annual units of ammunition produced by Taurus and CBC (as of January 2005)
- 2.1 Underreporting of registered small arms data
- 2.2 Estimated strength of the Brazilian armed forces
- 2.3 Current strength of the Brazilian Navy
- 2.4 Estimated current armed forces' small arms and light weapons requirements
- 2.5 Firearms held by CSC combat factions
- 2.6 Firearms held IC sections
- 2.7 Firearms holdings of combat units of a Brazilian infantry battalion
- 2.8 Firearms holdings of combat personnel in infantry units
- 2.9 Small arms held by individual artillery crews, by type of artillery piece

- 2.10 Small arms holdings for combat personnel of artillery units
- 2.11 Small arms held by cavalry crews
- 2.12 Small arms and light weapons holdings of cavalry unit combat personnel
- 2.13 Total estimates for army police corps
- 2.14 Holdings of the rest of the Army
- 2.15 Partial and total estimated holdings of the Brazilian Army
- 2.16 Small arms held by specific artillery units of the Marines
- 2.17 Small arms holdings per armoured Marines vehicle
- 2.18 Light weapons held by the Marines
- 2.19 Navy holdings
- 2.20 Air Force holdings
- 2.21 Strength and holdings of the reserves
- 2.22 Strength of Brazilian public security and criminal justice sectors
- 2.23 Public security and criminal justice holdings
- 2.24 Estimated holdings by CAC (2003)
- 2.25 Urban–rural distribution of registered private holdings
- 2.26 Proportion of registered small arms by type and state (if available)
- 2.27 Seized small arms by type and state

Maps

- 1.1 Political map of Brazil
- 2.1 Military regions of the Brazilian Army
- 2.2 Private (legal and illicit) holdings per 100 inhabitants (2007), by state
- 2.3 Legal private holdings per 100 inhabitants (2007), by state
- 2.4 Illicit (informal and criminal) holdings per 100 inhabitants (2007), by state
- 2.5 Private security sector small arms holdings per 100 people (2007), by state
- 2.6 State military and non-military police small arms holdings, per 100 people (2007)
- 2.7 Distribution of the Brazilian Army bases (and their stockpiles) and main arsenals

- 2.8 Distribution of the Brazilian Navy bases, Marines battalions (and their stockpiles), and arsenals
- 2.9 Distribution of the Brazilian Air Force bases, infantry battalions (and their stockpiles), and arsenals
- 2.10 Distribution of the Brazilian Army reserves shooting ranges

List of abbreviations

AG	Artillery group (Brazilian Army)
AnEEEx	Anuário Estatístico do Exército (Statistical yearbook of the Brazilian Army)
BINFAE	Batalhão de Infantaria da Aeronáutica Especial (Infantry Battalion of the Brazilian Air Force)
BNDE	Banco Nacional de Desenvolvimento Econômico (Brazilian Development Bank), subsequently BNDES
BNDES	Banco Nacional de Desenvolvimento Econômico e Social (Brazilian Development Bank), formerly BNDE
BRL	Brazilian real
CAC	<i>Colecionadores, atiradores, caçadores</i> (collectors, sports shooters, and hunters)
CACEX	Carteira de Comércio Exterior do Banco do Brasil (Bank of Brazil's Foreign Trade Bureau)
CBC	Companhia Brasileira de Cartuchos
CEV	Companhia de Explosivos Valparaíba
CNAE	Classificação Nacional de Atividade Econômica (National Classification of Economic Activities)
CSC	Command and support company (Brazilian Army)
CVM	Comissão de Valores Mobiliários (Securities and Exchange Commission of Brazil)
DFP	<i>Demonstrações financeiras padronizadas</i> (standardized financial statements)
DFPC	Diretoria de Fiscalização de Produtos Controlados (Directorate of Controlled Products of the Brazilian Army)
DFV	DF Vasconcellos Participações S.A.
DIMABEL	Dirección de Material Bélico (War Materials Department of Paraguay's Ministry of Defence)

EMBRAER	Empresa Brasileira de Aeronáutica S.A.	SENASP	National Public Security Secretariat
ENGESA	Engenheiros Especializados S.A.	SICOFA	Sistema de Controle Fabril (Arms Factories Control System)
FAMAE	Fábricas y Maestranzas del Ejército (Factories and Armouries of the Army of Chile)	SIGMA	Sistema de Gerenciamento Militar de Armas (Military Firearms Management System, run by the Brazilian Army)
FFE	Força de Fuzileiros da Esquadra (Fleet Marine Force)	SINARM	Sistema Nacional de Armas (National Firearms System)
FNSP	Força Nacional de Segurança Pública (National Public Security Force)	SIPRI	Stockholm International Peace Research Institute
GDP	Gross domestic product	TIMI	Taurus International Manufacturing, Inc.
HTS	Harmonized Tariff Schedule	USD	US dollar
IAN	<i>Informações anuais</i> (annual report)		
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)		
IC	Infantry company (Brazilian Army)		
IGP-DI	<i>Índice geral de preços–disponibilidade interna</i> (general price index–internal supply)		
IISS	International Institute for Strategic Studies		
IMBEL	Indústria de Material Bélico do Brasil		
INA	Indústria Nacional de Armas (Brazil)		
INDUMIL	Industria Militar (Colombia)		
MANPADS	Man-portable air defence system		
MR	Military region		
NBM	Nomenclatura Brasileira de Mercadorias (Brazilian Merchandise Nomenclature)		
NCM	Nomenclatura Comum do Mercosul (Mercosur Common Nomenclature)		
NCO	Non-commissioned officer		
NSD	National Security Doctrine		
PIA	Pesquisa Industrial Anual (Annual Industry Survey)		
PNEMEM	Política Nacional de Exportação de Material de Emprego Militar (National Policy for Export of Military Equipment)		
RO	Royal Ordnance, armaments division of BAE (British Aerospace) Systems		
SECEX	Secretaria de Comércio Exterior (Brazilian Foreign Trade Secretariat)		

About the authors

Pablo Dreyfus was research coordinator of the Small Arms Control Project of the Brazilian NGO Viva Rio. **Júlio Cesar Purcena** is researcher at the Small Arms Control Project of Viva Rio. **Benjamin Lessing** is a former researcher at the Small Arms Control Project of Viva Rio. **Marcelo de Sousa Nascimento** is chief statistician at the Instituto de Estudos da Religião (ISER). Viva Rio and ISER are both based in Rio de Janeiro, Brazil.

In memoriam: Pablo Dreyfus

Júlio Cesar Purcena, Benjamin Lessing, Marcelo de Sousa Nascimento, and the Small Arms Survey would like to express their ongoing sense of loss in the wake of Pablo Dreyfus's untimely passing in the tragic Air France accident on 1 June 2009.

Through his influential reports and his expertise in gun violence and arms trafficking, Pablo informed not only Brazil's gun legislation—notably the weighty Disarmament Statute of 2003—but also the establishment of the Permanent Commission on Arms Trafficking in the Brazilian Congress. While Pablo's main area of interest was Latin America, he also advised governments outside the region, such as Angola, and made significant contributions to international efforts to stem illicit arms flows.

Although Pablo was not able to see this *Special Report* to its completion, it is perhaps among the testaments of his enduring impact on small arms research. His co-authors sincerely hope that this volume will further deepen our understanding of the role of small arms in Brazil—and beyond.

On the personal level, we remember Pablo as a driven, intelligent, compassionate, and affable colleague. We will continue to miss him. Our deep condolences go out to his family, friends, and colleagues.

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Products (DFPC) of the Brazilian Army; Lieut.-Col. Jorge Toledo Freitas, DFPC, Brazilian Army; Special Agent Mario Marques, Rio de Janeiro SINARM office, Federal Police.

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Executive summary

It is not difficult to find evidence of Brazil's high levels of armed violence. The proof is in the grim statistics of the country's hospitals, morgues, and prisons.

This *Special Report* looks at two aspects of this problem. First, it explores the thriving Brazilian small arms industry, which, together with international trafficking networks, contributes to control failures and fuels small arms violence. Second, it maps out weapons holdings—by weapon type, holder, and location. This volume is a companion to the *Special Report* entitled *Small Arms in Rio de Janeiro: The Guns, the Buyback, and the Victims* (published December 2008), which focuses on the Brazilian city where the expression of the issues outlined here is at its most extreme.

Brazil is the second-largest producer of small arms in the western hemisphere. The firearms used in the country's crime are mainly these domestically produced weapons, particularly handguns, not the imported small arms as has been argued by Brazil's gun lobby and firearms industry. In fact, domestic small arms production boomed during the very same decade that witnessed a rise in violence.

Chapter 1 of this *Special Report* surveys Brazil's small arms manufacturers, providing detailed information on production, sales, and the domestic and export markets. It begins with a historical overview of weapons production in Brazil, paying particular attention to the policies of the military governments of 1964–85, which have moulded today's small arms industry. The chapter also looks at the ownership structure of Brazil's three large producers—Taurus, CBC, and IMBEL—and analyses the impact of their close relationships with the Brazilian military on the small arms market and on small arms regulations. Further, it investigates the ways in which companies have been able to acquire technology through public-private partnerships and, in some cases, by selling the companies only to later 'renationalize' them along with the know-how stemming from a stint of foreign ownership.

The chapter finds that:

- Brazilian production of small arms has grown steadily over the past three decades, particularly during the military governments of 1974–83, reaching a current value of some USD 100 million per year. Handgun production is the key to that increase.
- Exports of small arms, parts, accessories, and ammunition tripled between 1982 and 2007 to USD 199 million. The United States is the dominant importer of Brazilian firearms and parts—mostly Taurus handguns—while Western Europe has increasingly become a purchaser of ammunition.
- Despite its dominance in the region, Brazilian arms production constitutes just 0.06 per cent of the country’s industrial sector and has not been affected since the adoption of the Disarmament Statute in 2003.
- Production is unlikely to dip in the near future since Taurus (the leading company and exporter) has secured a niche in the enormous US market for good-quality pistols and revolvers, while CBC sells mainly to a captive and protected domestic public security market.

Chapter 2 finds that small arms possession is extremely heterogeneous across Brazil’s many states and geographical regions. There are some important common denominators, however, chief among them a history of poor registration and inadequate—though improving—control of small arms. Estimating weapons holdings is thus particularly difficult, since registers of small arms—if they exist and are open to the public—are incomplete. The authors triangulated data sets and supplemented them with scores of interviews with public officials in 25 states to arrive at estimates of holdings.

The chapter begins with an analysis of the regulatory framework for small arms and how it is applied in practice. It then maps out the universe of gun holdings in Brazil, both state-held and privately held, and, in the latter case, both legal and illicit. The final section analyses the data according to geographical distribution, drawing conclusions about the state-by-state and rural-to-urban distribution of small arms. The chapter contains some startling findings, such as:

- There are 17.6 million small arms in Brazilian hands.
- Illicit holdings account for 57 per cent of the total.

- Individuals and companies privately hold 72 per cent of legal small arms.
- There are high rates of privately held (legal and illicit) small arms in São Paulo and Brasília, the latter due to the large numbers of public security and military officials who reside there. High possession rates are also observable in states that underwent relatively recent colonization (expansion of the agrarian frontier), such as Acre, Roraima, Mato Grosso, and Mato Grosso do Sul.
- While handguns tend to predominate in urban areas, a more even distribution between revolvers and shotguns can be found in rural areas.

Both chapters expand and update research that first appeared in Brazil as *Armas e as Vítimas*, coordinated by Rubem César Fernandes and published in Rio de Janeiro by 7 Letras in 2005. ▀

Map 1.1 **Political map of Brazil**



Chapter 1

The Brazilian Small Arms Industry: Legal Production and Trade

Pablo Dreyfus, Benjamin Lessing, and Júlio Cesar Purcena

Introduction

While it is not the only country plagued by widespread armed violence, Brazil is one of only a few that also possess a large and thriving small arms industry. This situation translates into myriad implications for small arms issues in Brazil.

At the most immediate level, it is becoming clear that Brazilian-made small arms—particularly handguns—and not military-style automatic weapons smuggled into Brazil, make up the majority of small arms related to criminal activity. In 1998–2006, for example, 139,100 small arms were seized in the three important Brazilian states of Rio de Janeiro, São Paulo, and the Federal District (Brasília), with a clear predominance of Brazilian-made handguns (Câmara dos Deputados, 2006, pp. 338–40).¹ This finding runs counter to what was once conventional wisdom—in part circulated by the small arms industry itself: that criminals use military-style foreign-made small arms to commit crimes while law-abiding citizens use registered Brazilian-made small arms for legitimate self-defence. In reality, Brazil’s own small arms manufacturing companies produce a large percentage of the guns that are responsible for the country’s astronomical levels of armed violence.

The small arms industry has always been a part—and today makes up the most active sector—of a larger military–industrial complex, whose development and growth were shaped by Brazilian 20th-century political history, particularly by the policies of the military governments of 1964–85. The central role that the arms industry as a whole played in the economic and strategic plans of successive military governments had a deep impact on all aspects of how small arms are dealt with in Brazil, from policies on registration, possession, and the right to carry small arms, to the way arms exports are classi-

fied in official trade statistics, their status in the penal code, and the very structure of the market itself.

The nature of the Brazilian small arms industry today is largely the result of policies enacted in the 1970s. These were principally directed at creating a domestic military arms industry and only indirectly concerned with small arms. Ironically, it was the small arms industry that proved most resilient. Today, the Brazilian small arms industry is made up of a handful of companies, and is dominated by just two: Forjas Taurus S.A. (Forjas Taurus or Taurus) and the Companhia Brasileira de Cartuchos (CBC). These companies hold near-monopolies in handguns and small arms ammunition, respectively, and both continue to maintain strong ties with Brazil’s defence and public security establishments. The other major player in the small arms market, Indústria de Material Bélico do Brasil (IMBEL), is a public company administered by the Ministry of Defence, with strong ties to the Army; it is largely a producer of military arms and ammunition. Together, these companies have helped Brazil consolidate its position as a significant small arms producer and exporter, the second-largest in the western hemisphere after the United States.

This chapter seeks to answer a variety of questions linked to the Brazilian small arms industry:

- How did this industry reach its current size?
- Why is it so highly concentrated?
- What are its key markets, and how have they changed over time?
- Which companies shape the Brazilian small arms legal market?
- What are the main features of these firms?
- Does the industry rely more on the foreign or the domestic market?
- Is the industry competitive and innovative?
- Is it dependent on government protection, subsidies, and incentives?
- When and how did Brazil become a relevant player in the global small arms market?
- How might evolving domestic and international controls affect the size and dynamics of the industry?

The first section provides a brief introduction to the evolution of the small arms industry in Brazil, from its earliest incarnation in the early 19th century

as the King of Portugal's gunpowder factory, to the defining period of military rule in the 1970s. It then examines government policy and initiatives over the last 30 years and profiles the principal companies involved.

The second section presents an in-depth study of production, sales, and the domestic and export markets. Past and present trends are discussed with reference to the historical periods discussed in the previous section.

The conclusion offers a brief analysis of the Brazilian small arms industry using the theoretical tools developed by Keith Krause to explain the dynamics of military production and trade (Krause, 1995). Krause's work, which deals with the heavy conventional arms industry, is adapted here to the specific case of the small arms industry in Brazil. This section also presents an outlook for the future, highlighting the strategies Brazil's small arms producers are likely to pursue in the coming years, and the results that may be expected.

The Appendix provides a summary and description of the primary sources consulted, as well as a description and explanation of the methodological and data-related obstacles that arose in the course of this research.

Although this study relies on historical secondary sources and interviews for much of the history section, the primary research is based on official data from a variety of government sources.² While a great deal of information has been obtained and synthesized in this report, a number of difficulties arose with official sources. Not all sources were consistently available for the last 20 years, while others did not follow uniform reporting practices. In a few cases, official data contains errors, which were confirmed through subsequent communication with the relevant government bodies. The biggest challenge was the high level of secrecy and confidentiality with which the government has traditionally treated the issue of small arms. Arms have always fallen under the purview of the military, which in turn has made protecting the arms industry a priority. As a result, civilians, even civilian government ministries, simply cannot access the relevant information. In other cases, it appears that what should be public information is not available because it has not been collected and tabulated efficiently. This results in lacunae in historical series, contradictory or confused results, or even what appear to be intentional distortions. The Appendix, which as-

sesses some of these issues, is directed primarily at other researchers, as a way both to verify the work in this study and to help clarify questions on data for future research.

History of the small arms industry in Brazil

As is the case in many Latin American countries, the domestic arms industry in Brazil is essentially a 20th-century phenomenon, born in the 1930s along with import substitution strategies; prior to this period Brazil relied almost entirely on imports from Europe and the United States to supply its armed forces. The roots of Brazil's current position of regional dominance in arms production lie further back in its history, however. The first gunpowder factory appeared during the colonial period, when the Portuguese court relocated to Rio de Janeiro in the wake of the Napoleonic Wars. Yet it was during the late 19th century, which saw a war with Paraguay (1865–70) and the establishment of a republic at the hands of a military coup (1889), that a strong, centralized military began to voice the perceived need for 'arms independence'. When the supply from Europe and the United States abruptly dried up during the First World War, the need for a domestic arms industry became patent (Schwam-Baird, 1997, p. 67).

Immigrants from Europe in the south and south-east of Brazil became the country's first private arms producers. In the 1920s the firms Boito, Rossi, and the Fábrica Nacional de Cartuchos (today known as Companhia Brasileira de Cartuchos, or CBC) all began producing arms or ammunition.³ In 1937, Forjas Taurus, today one of the world's largest producers of handguns, began production.⁴ It was during this period, under President Getúlio Vargas's initial stint in power (1930–45), that the army opened its first small arms and light weapons factories.

By the Second World War, economic and political theorists were beginning to lay down what would be known a decade later as the Brazilian National Security Doctrine (NSD), a comprehensive programme that saw economic development, industrialization, and the creation of a domestic arms industry as facets of a single national project (Schwam-Baird, 1997, p. 71). Arms were identified as a key industry for development, not only strengthening Brazil's

armed forces and providing increased autonomy from the United States and Europe, but also bringing new technologies with positive side effects for Brazilian industry as a whole. While this doctrine would not be fully implemented until after the installation of the military government in 1964, aspects of its policy agenda—protectionism, government investment in key sectors, technology transfers, and import substitution—appeared under Presidents Vargas and Juscelino Kubitschek de Oliveira (1956–61), particularly in basic heavy industry sectors such as steel, petroleum and energy, and infrastructure (Schwam-Baird, 1997, pp. 70–81). This period saw the opening of a local subsidiary of the Italian company Pietro Beretta in São Paulo (bought by Taurus in 1980) (Wilson, 2001, pp. 29, 171), as well as the founding of the private Indústria Nacional de Armas (INA), which produced a variant of the Madsen 1950 .45 sub-machine gun.⁵

While the Vargas and the Kubitschek periods were important to Brazil's development, it was the aggressive protectionist economic policies of Brazil's military government (1964–85) that truly laid the foundations for the diversified, export-oriented industry that exists today. Different versions of the National Security Doctrine directed the policies of virtually all the military governments of the Southern Cone throughout the 1960s, 1970s, and 1980s. Adapted from French and US counter-insurgent military doctrines of the late 1950s and 1960s, the NSD sought to use national political, economic, and social policy in a 'total war' against the threat of communist expansion (a threat made all too real by the success of the Cuban Revolution in 1959). Economic development became a central front in this 'war' since, according to the logic of the doctrine, economic backwardness and poverty leave the door open to communist infiltration.

In the Brazilian version of the NSD, economic development—and especially industrial development—was a way of advancing the interests of the nation to a point where the country, due to its size, vast resources, strategic location, and uniqueness, would achieve national greatness (*grandeza*) and be respected as a regional power with global reach. The defence industry was seen as a catalyst for technological and economic development, but also as a way of building national power (Maldifassi and Abetti, 1994, p. 28; Schwam-Baird, 1997, pp. 33–45). The end result was a vision of national de-

velopment—including private industry—subordinated to the defence structure of the state.

For purposes of this research, technology is the most important aspect of this nexus between the private and state sectors. Military and civilian technicians schooled in the technical institutes of the armed forces were transferred to private or semi-private defence firms such as Engenheiros Especializados S.A. (ENGESA), a producer of military transports and light tanks, and Empresa Brasileira de Aeronáutica S.A. (EMBRAER), a producer of military and civilian airplanes (Schwam-Baird, 1997, p. 155). The military government advocated—and a number of private firms successfully negotiated—joint ventures with foreign firms and technology transfer agreements (Schwam-Baird, 1997, pp. 104–05).

As explained by Patrice Franko-Jones:

The partnership between the state and the firms throughout each step of the process allowed Brazil to develop military technologies indigenously. Control over technologies developed specifically for Third World conditions promotes the dual use of these products in other sectors, an increased rate of 'spin-offs' of research on both products and processes into other industries and conserved foreign exchange. In partnership with the state, Brazilian firms were able to develop indigenous technologies appropriate to national economic constraints as well as military demand. With a clear view of the objective of autonomy, international transfer agreements were negotiated which maximized the bargaining power of the Brazilian firm to control the imported technology (Franko-Jones, 1992, pp. 133–34).

In the case of the small arms industry, acquisition of foreign technology took an additional route: the purchase of Brazilian firms by foreign producers, followed years later by their 'repatriation'. This process began in the 1930s, when the country's principal private ammunition company, CBC, was sold to Remington Arms Company and Imperial Chemical Industries, only to be repatriated in 1980 with financial support from state banks. A similar process was observed with the main private handgun producer, Taurus, which was sold in 1964 to Smith & Wesson and 'renationalized' (purchased by Bra-

zilian stockholders) in 1977 (Purcena, 2003, pp. 16–21). These cases are reviewed in greater detail below.

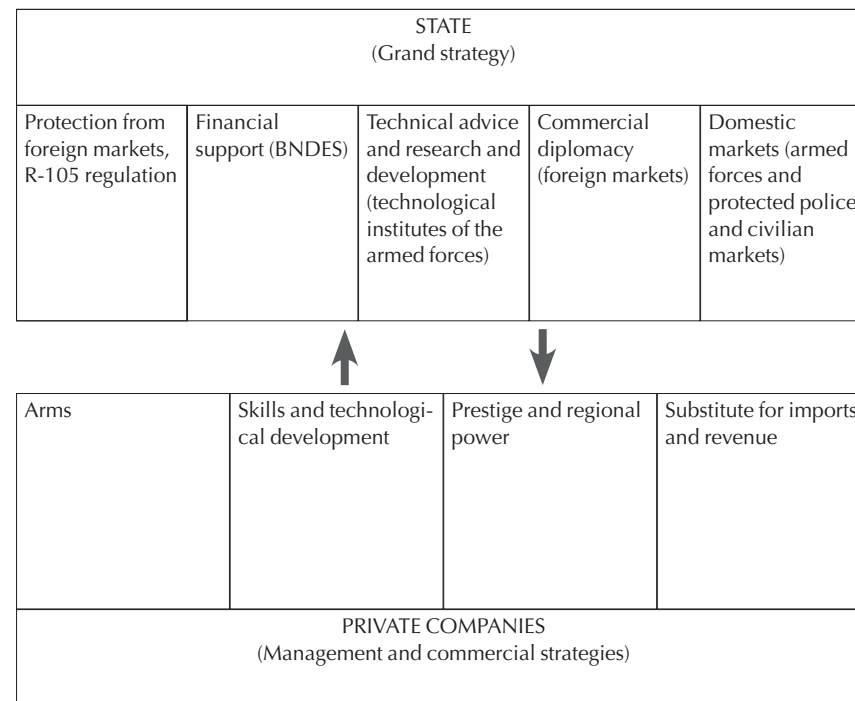
From its inception, the military regime promoted and extended protectionist policies for the domestic arms industry. These policies were particularly strong for small arms, for which the regime sought total self-sufficiency. In 1934 the Army was made responsible for controlling and monitoring the production, import, export, and domestic sale of controlled products (which include small arms and dangerous strategic industrial elements). In 1965 it enacted decree R-105, which states that ‘since the national industry is able to supply the domestic market then, in principle, the importation of handguns, shotguns, and ammunition for civilian use shall not be authorized’ (Ministério da Defesa, 1965).⁶

Aware of the need to achieve economies of scale in technologically complex production processes with high research and development costs, the regime looked towards exports to offset the decrease in demand. In 1974, the military government implemented the National Policy for Export of Military Equipment (Política Nacional de Exportação de Material de Emprego Militar, PNE-MEM), a series of incentives for private and state-owned producers to export arms (Lampreia, 1995). In 1975, the armed forces reorganized their arms factories into a single company, IMBEL (see below), while throughout the decade cooperation between military research institutes, industrial organizations, and the Brazilian Development Bank (Banco Nacional de Desenvolvimento Econômico, BNDE)⁷ led to the development and consolidation of new arms-producing companies. BNDE also provided capital funds in 1980 for the repurchase by Brazilians of controlling shares in CBC, Brazil’s only small arms ammunition producer (Purcena, 2003, pp. 11–15). Other factors that spurred the development of Brazil’s defence industry were the US decision to limit transfers of military technology to Brazil and the Brazilian government’s renunciation in 1977 of the 1952 military assistance agreement with the United States (Maldifassi and Abetti, 1994, p. 28).

Cooperation between the state and the private sector involved important flows of resources, technology, and personnel, as illustrated in Figure 1.1.

While not as dependent on advanced technology as other defence sectors, the small arms industry was able to benefit from these initiatives, ‘hitching a ride’ on the so-called economic miracle sparked by Brazil’s growing arms

Figure 1.1 **Cooperation between the state and the private sector**



industry. In the 1980s, Brazil’s defence industry boomed as it exported heavy military equipment to the Middle East during the Iran–Iraq war. A period of readjustment followed the end of the war, with a number of heavy military equipment firms closing or retooling for civilian production (Franko-Jones, 1992). At the same time, the sudden and abrupt reduction in military expenditures that accompanied the end of the dictatorship and the transition to democracy in 1985 also contributed to the decline of the heavy arms sector.⁸

With the demise of military rule, strengthening Brazil’s arms industry as a way of achieving *grandeza* ceased to be one of the guiding principles of the state (although this mentality continued to prevail within sectors of the Brazilian military and diplomacy). Consistent subsidies to arms companies disappeared as military budgets decreased, and achieving prestige and regional power became an essentially economic and diplomatic affair. A new factor

came into play, however: influence in domestic affairs related to public security matters. After the transition to democracy the military maintained control over monitoring and licensing the production, domestic sale, and export of small arms, a role it continues to play. The military still decides, for example, what types of weapons the police are allowed to use and whether they may import them from foreign countries. It is also the Army that decides (discretionally) what types of small arms civilians are allowed to own and carry.

Although it had lost its edge in heavy conventional arms, Brazil was well established as a mid-sized global player in the international small arms market by the 1990s, as shown in Figure 1.2. Considering that civilian and police markets, above all in the United States, offer more stable and reliable demand than the sporadic purchase cycles typical of heavy military weapons, the small arms industry in Brazil appears to have achieved sustainability for the mid- to long-term, while the United States has not. Indeed, in the enormous US market, Taurus secured a market niche for good-quality pistols and revolvers at competitive prices.

By 2007, exports had almost tripled from 1999 levels, reaching USD 199 million (see Figure 1.2). The 1990s was also a time of consolidation: today Brazil's small arms industry is concentrated around three large producers: Taurus,

CBC, and IMBEL. Though only IMBEL is state-owned, CBC and Taurus both maintain close contact with the Brazilian military and have a great deal of influence over both domestic and foreign policy.⁹ The industry has its own lobby, which is active in opposing domestic arms control legislation.

Findings: Brazil's small arms industry

Research on legal arms production in Brazil is complicated by the fact that much of the most important data is not available to the public. Systematic and sufficiently disaggregated surveys of economic activity are a relatively recent phenomenon in Brazil, making long time series impossible in some cases. In addition, a number of anomalies and odd results call into question the integrity of certain data points, if not entire sources.

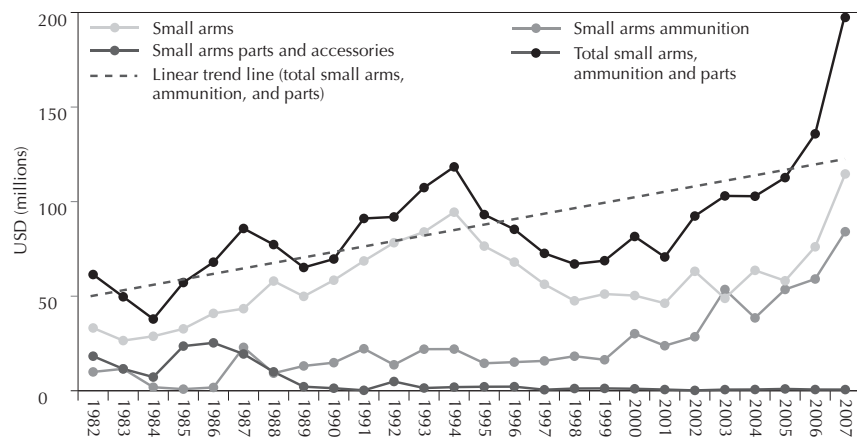
In the light of these problems, this study adopts a method of juxtaposition and triangulation, bringing to bear whatever data is available from the various sources to try to correct for problems of comparability and come to a reasonable conclusion about what a realistic value might be for missing or inconsistent items (see Appendix 1).

Producers

Brazil is South America's largest producer of small arms and military equipment. After the United States, it has by far the most diversified output in the hemisphere. Brazil's arms industry is made up of state-owned and private companies, both of which have shown initiative in expanding into foreign markets, signing licensed production and joint venture agreements, and even creating foreign subsidiaries.

Brazilian government statistics show that total sales of nationally produced non-military small arms, ammunition, and parts in 2005 were about USD 158.8 million (IBGE, 2007d).¹⁰ A great deal of this production was probably exported: the Brazilian government reported total exports of small arms and military items for 2005 as USD 109.8 million, or 69 per cent of total sales.¹¹ The actual figure may be even higher, given that state-to-state transfers are not included in published trade statistics.

Figure 1.2 **Brazil: small arms exports by type in USD millions (2007 constant), 1982–2007**



Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US-GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Major producers

IMBEL¹² is a state-owned company with ties to the Brazilian Ministry of Defence, specifically the Brazilian Army. In addition to commercial explosives, accessories, charges for heavy ammunition, propellants for missiles and rockets, communications and electronic equipment, and other heavy military equipment, IMBEL manufactures and supplies FAL assault rifles in 7.62, 5.56, and .22 calibres (the latter for training) for military use. It also manufactures a line of pistol models based on the Colt .45, available in .45, .40, and 9 mm calibres for military and police use (M911 A1, IMBEL MD1, M973, and variants) and .380 calibre for civilian use (MD1N, GC MD1, and variants).¹³ In the 1990s the plant developed the MD97LC 5.56 mm assault rifle, which is being adopted by some light infantry units of the Brazilian Army. A carbine version of the rifle is currently being used by the police of the State of Minas Gerais as well as the members of the National Public Security Force, a rapid deployment police force of the Ministry of Justice for crisis situations.¹⁴

IMBEL's small arms are produced at the Itajubá plant in Minas Gerais. The plant opened its doors as the Itajubá Military Arsenal in July 1934 and was administered by the Army. In the 1930s, Itajubá produced 1909 Mauser bolt-action rifles under a licence agreement with the Deutsche Waffen- und Munitionsfabriken (German Weapons and Munitions Works). Mauser production stopped after the Second World War. In 1960, production began on Colt .45 M19A1 semi-automatic pistols for the Brazilian armed forces (about 50,000 units are still in service). In 1964, a licence agreement was signed with FN Herstal for the production of 7.62 FAL assault rifles. At least 200,000 were produced between 1964 and 1983 and the rifle is still in production (Klare and Andersen, 1996, p. 18).

IMBEL was created in 1977 from the Army's arsenals and armouries. In 1983, the company suffered a financial crisis provoked by the interruption of purchases by the Army, its main client at the time, and during the 1980s it became severely indebted to the Brazilian government. Under national law, it could not sell weapons to national state institutions (such as the police) while it owed money to the government. Illustrating the permeability of the divi-

sion between the private and state defence industry, in the early 1980s the management of IMBEL was handed to José Luiz Whitaker Ribeiro, also president of ENGESA, a private defence company that specialized in manufacturing tanks. It was during this period that IMBEL's Realengo ammunition plant was deactivated and its equipment incorporated into CBC in exchange for a 23.7 per cent stake in the firm for IMBEL. After Whitaker's reorganization, control of IMBEL was passed back to its own administrative board (Franko-Jones, 1992, pp. 80–83).

In 1985 IMBEL entered into partnership with the US-based Springfield Armory for the distribution of more than 200 variants of the Colt .45 pistol in the US civilian market. In 1998 IMBEL's .45 pistol was adopted as the official side weapon of the US Federal Bureau of Investigation's hostage rescue team, delivered by the Springfield Armory. Currently 65 per cent of the Itajubá plant's revenue comes from sales of assault rifles and pistols. In 2006, the company had net sales of USD 34.5 million and a net profit of USD 0.9 million. In 2007, the company's net sales were worth USD 29.3 million, but it posted a loss of USD 15.5 million (IMBEL, 2008).

The *Small Arms Survey 2002* reveals that more than 90 per cent of the 2,000 .45 calibre pistols that the company exports every month go to the US market, and between 40 and 50 per cent of the company's production is exported (Small Arms Survey, 2002, p. 32).¹⁵ IMBEL sources also affirmed in 2004 that 75–95 per cent of the company's turnover is generated by the partnership with Springfield for the production of pistols.¹⁶

During the 1990s, income generated through exports enabled the company to gradually start paying off its debt to the Brazilian government. Through a debt payment plan negotiated with the Army and an aggressive financial reorganization plan, the company was again authorized to sell to state bodies. According to the recently organized Arms Factories Control System (Sistema de Controle Fabril, SICOFA), IMBEL reported production of 334,534 small arms between July 1977 and June 2004.¹⁷

Until 2004, IMBEL owned a 30 per cent share of stock in CBC (see below). IMBEL has formed a joint venture—South American Ordnance—with Royal Ordnance (RO), a subsidiary of British Aerospace Systems, and Schahin Participações, a Brazilian company. In addition to supplying heavy military artil-

lery ammunition to RO, South American Ordnance distributes IMBEL's other products worldwide, including small arms, light weapons, and ammunition. IMBEL's small arms are popular among police and armed forces in South America.

Forjas Taurus (Taurus) is a major producer of handguns, with 39 revolver and 18 pistol models.¹⁸ The company was founded in Porto Alegre in 1937 as a tool manufacturer and began to produce revolvers after the Second World War, achieving large-scale production in 1951. By 1964 the company had consolidated its position in the domestic market, amplified and modernized its production plant, and intensified production. During the politically turbulent 1960s there was an increase in controls on the domestic sale of weapons; at that time, the company was not yet equipped to compete on the international market. It was under these circumstances that most of the company's shares were sold to Smith & Wesson at the beginning of the 1960s.

In 1977, with financial support from state banks, the Brazilian firm POLI-METAL purchased a controlling share of the company's stock, 'renationalizing' the company and all the know-how that had been transferred to it under Smith & Wesson's ownership. Taurus continued to expand, buying a British concern, IFESTEEL, in 1979 and in 1980 buying out Beretta's Brazilian subsidiary. With this purchase, Taurus incorporated further machinery and technology and began the production of Beretta licensed pistols (Model 92) and 9 mm sub-machine guns (M-12). Both these purchases were key to accumulating the production capacity and know-how Taurus enjoys today (CVM, 2006b; Purcena, 2003).¹⁹

The Taurus name has become internationally recognized, particularly in the United States. Besides two non-gun related subsidiaries, Forjas Taurus owns Taurus Holding, which controls Taurus International Manufacturing, Inc. (TIMI), Taurus's US subsidiary. Opened in 1983, TIMI helped Taurus consolidate its position in the lucrative US handgun market. TIMI is based in Miami and comprises a factory that assembles arms specifically for the US market and a distributor for Brazilian-made Taurus arms. In 1997, Taurus purchased from Rossi (see below) the patents, designs, and production rights for its short arms, making it the only Brazilian supplier of pistols and revolvers for civilians. Taurus owns a non-controlling share of stock in Rossi (CVM, 2006b). In 2007, Taurus had sales of USD 121.2 million and profits of USD 25

million, and registered a 20 per cent profit margin (CVM, 2006a). Forjas Taurus has a strategic partnership with Chile's state-owned Fábricas y Maestranzas del Ejército (FAMAE) to produce the MT-40 .40 sub-machine gun and a .40 carbine (the CT40) in Brazil with Brazilian- and Chilean-made parts.

Taurus started diversifying and modernizing its production away from traditional (though reliable) Beretta models in the late 1990s, to counter the threat of competition from imported Glock 25 pistols for the civilian market (see Box 1). At the time, there were no domestically produced polymer pistols, and the favourable exchange rate made imports cheap.²⁰ Taurus responded with new 'fashionable' calibres such as the .40 and the adoption in the late 1990s of new technologies, including the manufacture of polymer and titanium pistols. The company also introduced a line in good quality and reliable revolvers. Through this combination of 'classic but reliable' and 'trendy and good quality' products, Taurus conquered a niche in the US market, as is explored in the export section, below.²¹

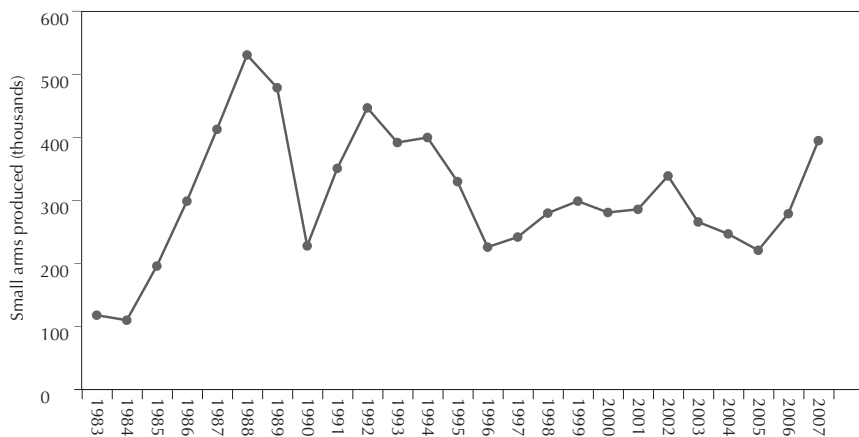
Taurus is the jewel in the crown of Brazil's small arms industry (and, to some extent, its arms industry as a whole). While its total production of small arms in terms of units is not disclosed by the company, sales data provided to the Securities and Exchange Commission of Brazil (Comissão de Valores Mobiliários, CVM) can assist in estimating the number of units produced.²²

But for all its success and the apparent stability of its foreign market share, Taurus seems to be hedging its bets. In recent years it has diversified production into related but non-firearm product areas such as bulletproof vests, helmets, armour for cars, hand tools, and machine tools.

Although the official name of the entire corporate entity is also Forjas Taurus, in its financial declarations Taurus distinguishes between the sum of all its operations, referred to as 'Grupo Taurus', and its small arms business, referred to as Forjas Taurus. The relative importance of small arms to the company as a whole can thus be determined. Data shows that while Group Taurus as a whole is generally expanding, gross revenue from small arms sales is decreasing.

Companhia Brasileira de Cartuchos is the only Brazilian producer of ammunition for the civilian market. In addition to a wide range of ammunition for handguns and long arms, CBC produces 11 models of shotgun and six models of rifle (CBC, n.d.).

Figure 1.3 **Forjas Taurus: estimated production of small arms, in thousands of units, 1983–2007**



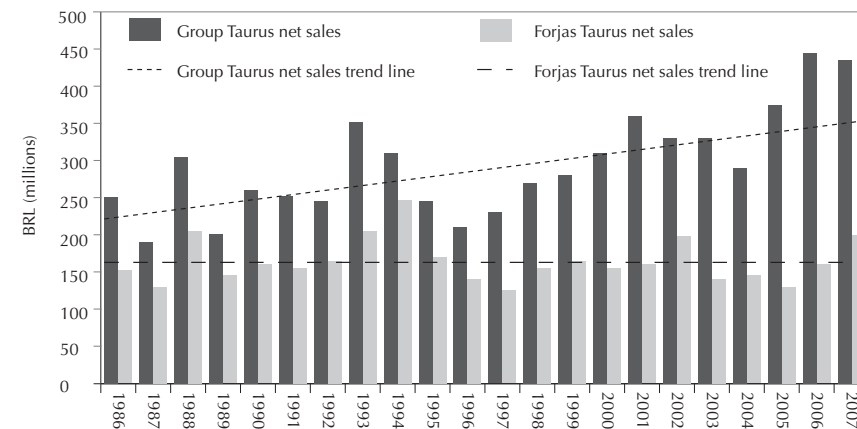
Note: Data about small arms from annual reports (informações anuais, or IANs) and about sales from standardized financial statements (demonstrações financeiras padronizadas, or DFPS).

Source: CVM (1995a; 1995b; 2006a; 2006b); value updated based on general price index–internal supply (IGP–DI) for 2006 (BCB, 2008); analysis by Viva Rio

Founded in 1926 as the Fábrica Nacional de Cartuchos e Munições Ltda., the company was sold in 1936 to Remington Arms Company and Imperial Chemical Industries, which brought new technology and productive capacity to the company. By 1960, having consolidated its position as a producer of cartridges, it began producing a small line of long arms, which it started to export in 1966. The company was renationalized in 1980 (see below), and in 1988 became a publicly traded company (CVM, 2006b).

The company expanded in the early 1990s through acquisitions, and by 2002 CBC had profits of USD 3.7 million and net sales of USD 49.9 million. Of its net sales, 34 per cent was from exports, 29 per cent from sales in the Brazilian civilian market, and 37 per cent from sales to the Brazilian police and military. Ammunition accounts for the vast majority of sales, 86.8 per cent. In 2006 the company posted profits of USD 6.7 million and net sales of USD 109.6 million. Exports were the main source of revenue for the company and the share of cartridges had decreased to 71 per cent of the revenue (CVM, 2006b). According to SICOFA, CBC produced 58,830 long arms between May 2003 and November 2004.²³

Figure 1.4 **Net sales: Group Taurus vs. Forjas Taurus (small arms only) in BRL millions (2006 constant), 1986–2003**



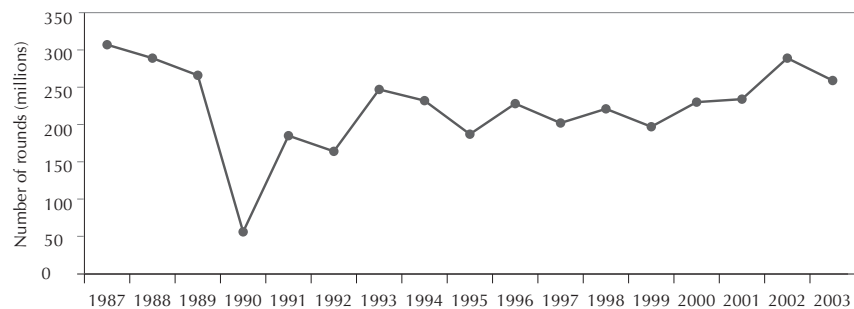
Note: Data about small arms from IANs and about sales from DFPS.

Source: CVM (1995a; 1995b; 2006a; 2006b); value updated based on IGP–DI for 2006 (BCB, 2008); analysis by Viva Rio

As with Forjas Taurus, it is possible to produce a rough estimate of total production from financial data on file with CVM (see Figure 1.5).

While CBC is not the only Brazilian small arms firm to have been purchased by foreigners and then renationalized (see Taurus, above), it is perhaps the textbook case of cooperation between private enterprise, the military, and the government (in this case, a branch of the military). In 1979, IMBEL bought CBC from its foreign owners using funds from Brazil’s National Development Bank. As part of the deal, CBC took over production of 7.62 ammunition from IMBEL. In 1988, the company’s shares started to be publicly traded, and a year later the DFV Participações investment group purchased 70 per cent of the controlling shares from IMBEL. IMBEL retained a 30 per cent stake in CBC, and much of the company’s board was made up of active or retired military personnel. Finally, in April 2004, IMBEL sold off the bulk of its remaining shares to PCDI Participações Ltda. (most probably to raise cash to pay off a debt to the federal government, which had made it ineligible for contracts with state police corps). With the current available data, it is not possible to affirm whether IMBEL is still represented in the two per cent share announced in 2006.

Figure 1.5 **CBC: estimated production of ammunition in millions of rounds, 1987–2003**



Note: Data about small arms from IANs and about sales from DFPs.

Source: CVM (1995a; 1995b; 2006a; 2006b); analysis by Viva Rio

What is known about DFV and PCDI? Between 2004 and 2006, DFV was acquired by Cemisa, a shadowy company belonging to Charles Ltd. and located in the tax haven of the British Virgin Islands. Who or what is Charles Ltd.? This mystery will most likely remain unsolved, since CBC announced its withdrawal from the stock market on 27 September 2006, which means that information about it will no longer be available from BOVESPA (the São Paulo Stock Exchange) or CVM. Similarly, PCDI is owned almost entirely by the foreign firm Brookmon Trading Corp., whose location is undeclared. The remaining shares (0.001 per cent) are owned by Frank de Luca, president of DFV.

There is nothing necessarily wrong with a private firm being owned almost entirely by two foreign companies, one of which is based in a tax haven and the other in an undisclosed location. It is worth remembering, however, that CBC was nationalized with public money and was entrusted to IMBEL, which is controlled by the Army. It is also worth reconsidering, in light of the above, the appeals to patriotism and *grandeza* the gun lobby so often makes, and the accusations of disloyalty and treason it levels at gun control advocates.

Amadeo Rossi (Rossi) has sold its short arms production to Taurus, but continues to produce shotguns and rifles, which make up 70 per cent of its total sales. It owns one non-arms-related subsidiary. The company suffered a loss of USD 21 million in 2001, the last year for which data is available at CVM or BOVESPA. Rossi exports 77.3 per cent of its production; 50 per cent of production is sold through its US distributor Braztech Inc. (CVM, 2002b).

Other producers

E.R. Amantino & Cia./Boito (E.R. Amantino) is the producer of the Boito line of hunting shotguns, which is very popular in the producer's home state of Rio Grande do Sul. The company produces the following models: A-680, A-681, Era 2001, Miura I, Miura II, Pump BSA-5T-84, Reúna, and the hand shotgun Pistola B-300.²⁴

Companhia de Explosivos Valparaíba (CEV) is a producer of grenades and mortars. According to *Jane's Infantry Weapons 2001–2002*, CEV produces M3 and M4 hand grenades as well as the TIR 60 AE M3, TIR 81 AE M4, and TIR 81 AE M7 mortar bombs (Gander, 2002). It has also produced a line of gas grenades for anti-riot use and grenade launcher adapters. In 1997, CEV announced that its sub-machine gun model, the Mtr M9 M1-CEV9, was ready for sale, although no further news of this item has been reported since 1998 (Forecast International, 2002b).

Mekanika/Bilbao. Both of these small firms were involved in the production of the Uru Model II 9 mm sub-machine gun, Mekanika from 1979–88 and Bilbao, which bought the rights from Mekanika, from 1988. Bilbao apparently sold the rights to Rossi, which has produced some 9,000 Urus (Gander, 2002).

Production

The most comprehensive and current data on total small arms, ammunition, and parts production in Brazil comes from the *Pesquisa Industrial Anual–Produto* (the Annual Industry Survey by product, or PIA–Product). Based on a survey of all industrial production facilities in the country, organized by economic activity, these figures offer the best picture of recent total small arms, ammunition, and parts production. Unfortunately, this series only began in 1998.

While there is no disaggregated data available for the period prior to 1998, the data from the Economic Census, carried out sporadically between 1950 and 1985, sheds some light on the historical evolution of the small arms industry. Due to the classification system used by the census,²⁵ only small arms and parts thereof—not ammunition—are included here.

Both PIA and Economic Census data reflect value. To get an idea of quantity of small arms produced, this study relies on data collected by the Army,

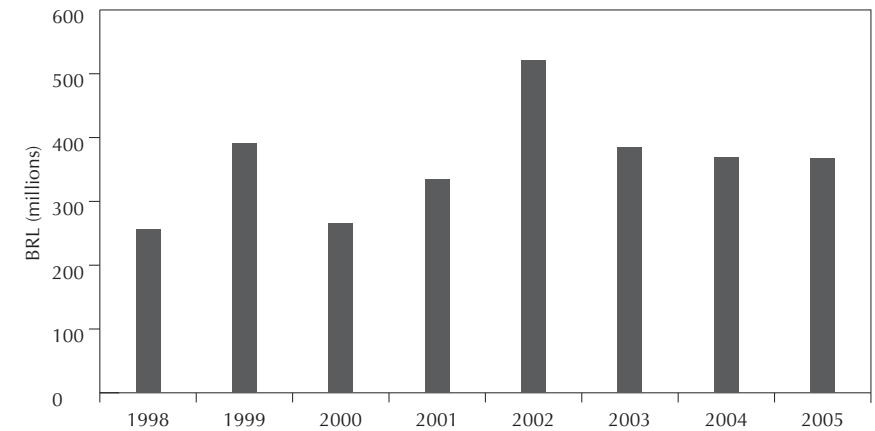
Box 1 Glock in Brazil?

Starting in mid-2005, Montevideo-based Luiz Antônio Horta, the president of Glock America S.A., which represents Glock sales in Latin America, initiated an aggressive lobbying campaign to build up a production facility in Brazil that would be used as an export platform for markets in Latin America, Africa, and parts of Asia (Studart, 2005). The original goal was to produce about 300 pistols per year in Brazil (Studart and Marques, 2006). Negotiations were started with the Brazilian Army's Directorate of Controlled Products (DFPC), which formally authorizes and controls production in Brazil. Authorization was rejected, however, and, after much insisting, Glock suspended its plans in March 2007, though keeping open 'the possibility of negotiating again in the future' (Abdala, 2007). The Brazilian Army denied the authorization on the basis that Glock did not offer the 'necessary conditions and guarantees' to produce small arms in Brazil (Câmara dos Deputados, 2006).

Official press releases and statements by Horta reveal a different story. They suggest that Glock refused an unyielding counter-proposal presented by the Brazilian Army that called on it to form a joint venture with IMBEL, which would administer the factory. The proposal also stipulated that Glock Austria would only export to countries in the northern hemisphere while Glock Brazil would export to all countries in the southern hemisphere. Glock would make 100 per cent of the investment (initially 30 USD million), but 50 percent of the revenue would go to IMBEL. During the first three years production would be limited to 5,000 pistols per year, all of which would be exported; after the third year pistols would be made with components entirely manufactured in Brazil (Studart and Marques, 2006; Abdala, 2007). Everything indicates that had Glock opened the factory in Brazil, the company would have followed the same pattern as that of Smith & Wesson and Beretta, which were eventually nationalized with the transfer of technology, machinery, and know-how to a Brazilian company (Taurus S.A. in the previous cases and IMBEL in the case of Glock). The building of a production and export facility by Glock in Brazil would have created serious ethical and eventually legal problems. By exporting from Brazil to the southern hemisphere, Glock would have been able to overcome the European Code of Conduct regarding exports to countries in conflict or with serious human rights violations (Control Arms, 2006, pp. 3, 21). This fact was noticed at a Brazilian congressional commission hearing, which in 2006 recommended rejecting the authorization to Glock precisely on that basis (Câmara dos Deputados, 2006, p. 430).

which by Brazilian law is ultimately responsible for monitoring and licensing the production, sale, transport, and export of controlled substances, including small arms. In theory, the Statistical Yearbook of the Army (Anuário Estatístico do Exército, AnEEEx) contains a register of every permitted-use firearm and cartridge produced in Brazil;²⁶ in practice, some years lack key data from small arms-producing regions. In addition, the Army's data collection

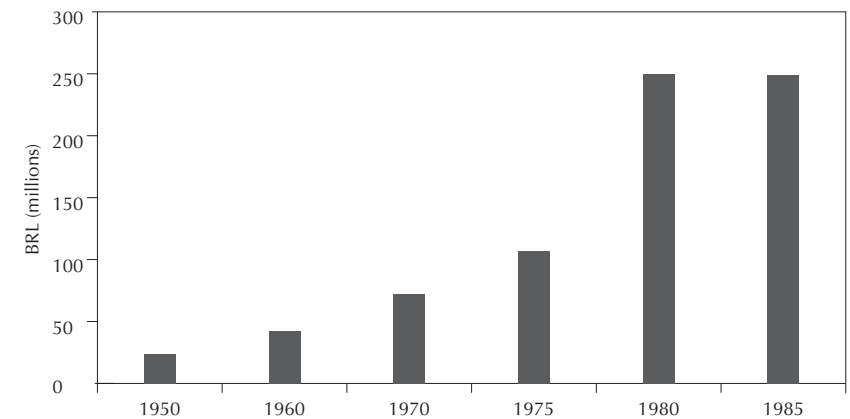
Figure 1.6 **Brazil: small arms production in BRL millions (2006 constant), 1998–2005**



Note: Data concerning small arms is coded 2971 (manufacture of small arms and ammunition) in the PIA–Product database.

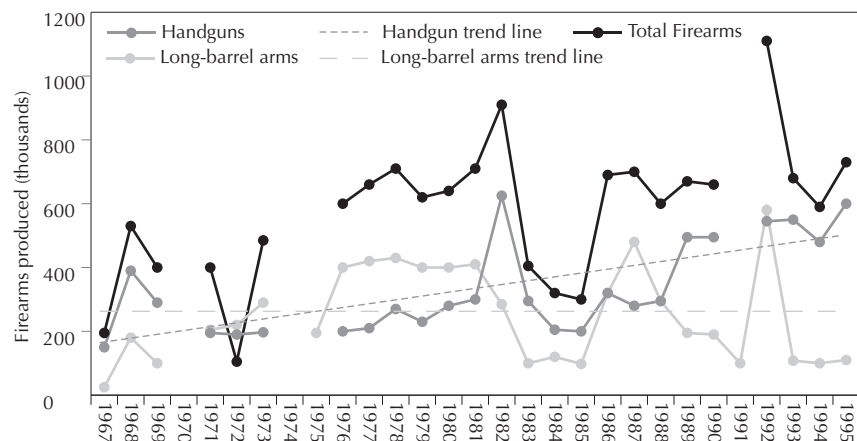
Source: IBGE (2007b); value updated based on IGP–DI for 2006 (BCB, 2008); analysis by Viva Rio

Figure 1.7 **Brazil: small arms production in BRL millions (2006 constant), 1950–85**



Source: IBGE (1985), value updated based on IGP–DI for 2006 (BCB, 2008); analysis by Viva Rio

Figure 1.8 **Brazil: production of permitted-use firearms in Brazil, in thousands of units, 1967–95**



Note: No data is available for 1970 or 1974. In 1975 and 1992, no data was available for Rio Grande do Sul, where all companies except IMBEL are located. This resulted in anomalously low numbers for total handgun production. For these years, data points for 'Handguns' and 'Total firearms' are thus eliminated, but 'Long-barrel arms' appear as published. In 1986 and 1993–95, reported handgun production for São Paulo was zero. Since average handgun production for São Paulo was around 50,000 per year, a zero value is suspect, but the difference compared to total handgun production was not enough to warrant cutting the data points.

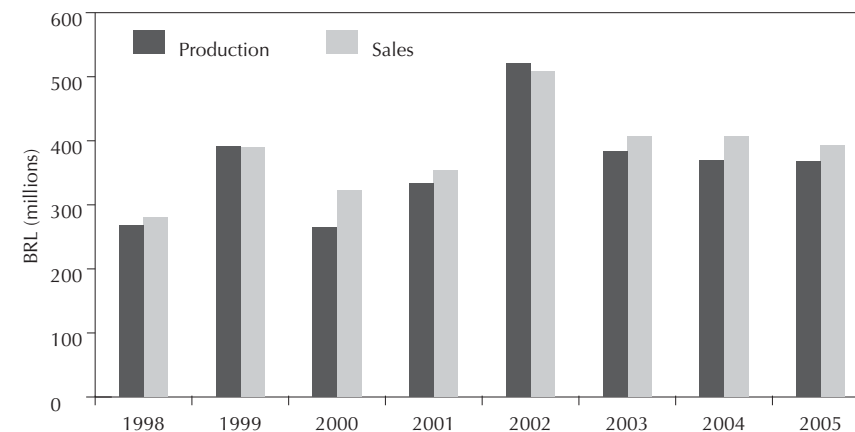
Source: Ministério da Defesa (2003); analysis by Viva Rio

methodology is relatively opaque, making it difficult to evaluate the reliability of the data. The data was long considered a state secret, however; it being made available for this study is itself an encouraging sign.

The lacunae and variability shown in Figure 1.8 make it difficult to draw strong conclusions about small arms production, but an upwards trend is indisputable, with average production more or less doubling from 400,000 to 800,000 units per year in the three decades shown. It is also clear that handgun production is the key to that increase: average long-barrel arm production has essentially remained constant.

Regarding ammunition, the AnEEEx data is even less illuminating. What does seem clear is that, excluding the pre-1975 period and with the exception of the years 1982–85, ammunition production is almost entirely made up of bullet cartridges. The data should be seen as supplementary to the analysis of CBC presented above.

Figure 1.9 **Brazil: small arms production and sales in BRL millions (2006 constant), 1998–2005**



Note: Data concerning small arms is coded 2971 (manufacture of small arms and ammunition) in the PIA–Product database.

Source: IBGE (2007d); value updated based on IGP–DI for 2006 (BCB, 2008); analysis by Viva Rio

In sum, Brazilian production of small arms has grown steadily over the years, particularly in the heyday of the military government (1974–83), reaching a current value of about USD 100 million per year. Sales figures, which tend to follow production figures quite closely, can provide additional information.

Sales

The PIA–Product survey defines the value of production in terms of sales figures.²⁷ Not surprisingly, there is little difference between the two series (see Figure 1.9).

Net sales are also reported in companies' yearly filings with the CVM. Although this only encompasses the three largest private small arms producers (and excludes IMBEL), the sum of these companies' sales may be used to estimate total national small arms sales.

CBC is the monopoly producer of civilian-use ammunition, manufacturing only a modest line of hunting rifles and shotguns, while Taurus and Rossi produce the bulk of Brazil's small arms and all of its civilian-use handguns. With the purchase of Rossi's handgun operations in 1997, Taurus became the sole Brazilian producer of civilian handguns (with a corre-

sponding decrease in Rossi's segment). Sales of ammunition have been relatively constant over the years, while sales of small arms, and in particular those produced by Taurus, have varied considerably. Indeed, for Taurus and CBC, sales increased by 26 per cent and 23 per cent, respectively, between 2003 and 2006 (Purcena, 2008).

How good a proxy are total sales of these three companies for total sales reflected in the PIA–Enterprise survey? A comparison reveals a relatively close fit for the available years (1983–2006).

The size of Brazil's small arms industry in context

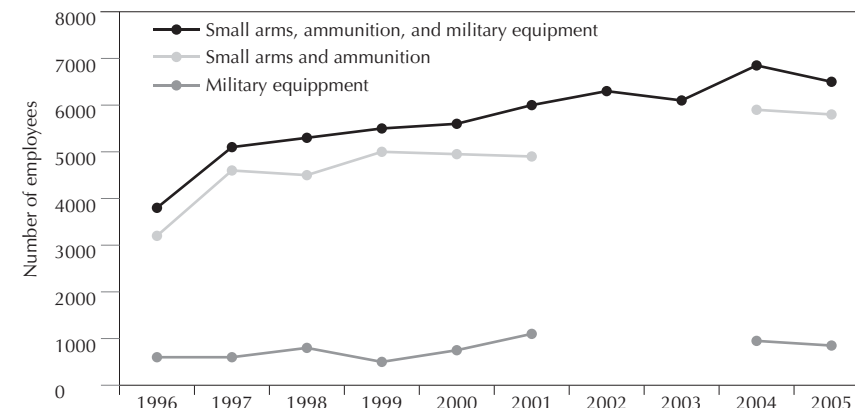
Brazil's level of production makes it a medium-sized small arms producer—the second-largest in the western hemisphere and the dominant regional player. Yet small arms production constitutes an infinitesimal portion of total economic activity. Indeed, the tiny role played by the small arms industry debunks arguments made by the gun lobby against restriction of weapons sales to civilians and other gun control measures on the grounds that the arms industry represents a major source of employment and income generation for Brazilians.

This section analyses the role of the small arms industry within the Brazilian economy, observing its behaviour over almost ten years and taking the 2003 Disarmament Statute into consideration. Seen as percentages of Brazil's gross domestic product from 2001 to 2005, the three sectors of economic activity are distributed as follows: services (63–67 per cent), industry (27–30 per cent), and agriculture (6–7 per cent) (IBGE, 2008).

Within the industrial sector, the Machinery and Equipment division—which includes the small arms industry—shows no major change for the period 1996–2005. During that decade, the sector produced an average share of six per cent of the total produced by Brazilian companies (IBGE, 2007a). The small arms share within this division never surpassed one per cent of the total produced (IBGE, 2007a).

The small arms industry clearly has not suffered as a result of the Disarmament Statute, as gun advocates had warned. Its role has remained stable at around 0.06 per cent of the Brazilian industrial sector, which represents one-third of the economy.

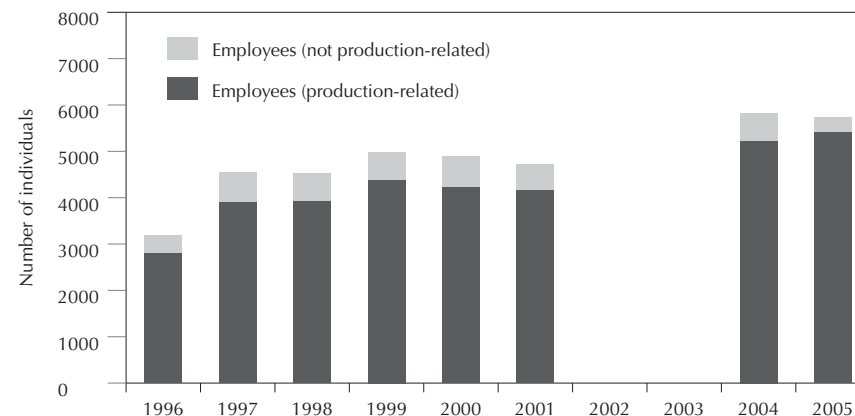
Figure 1.10a **Brazil: employment in the small arms and military equipment industry, 1996–2005**



Note: For 2002–03, no data is available for small arms or military equipment separately, but only for the two combined. Data from PIA–Enterprise.

Source: IBGE (2007c); analysis by Viva Rio

Figure 1.10b **Brazil: employment in the small arms industry, 1996–2005**



Note: For 2002–03, no data is available for small arms or military equipment separately, but only for the two combined. Data from PIA–Enterprise.

Source: IBGE (2007c); analysis by Viva Rio

The work force affiliated with the small arms and military equipment industry increased significantly—by 80 per cent—between 1996 and 2005 (see Figures 1.10a and 1.10b). Yet these new jobs represent only 0.02 per cent of the jobs offered

by Brazilian companies in 2005.²⁸ Brazil is not unusual in this regard. The US small arms industry, the largest in the world, has also been shown to be insignificant in the context of the US economy as a whole (Small Arms Survey, 2002, p. 27).

Foreign trade

Compared to official data on production and sales, the data on foreign trade is far superior in terms of disaggregation and years available. A complete data set for all Brazilian exports and imports by country and by export code is available for the period 1982–2007.

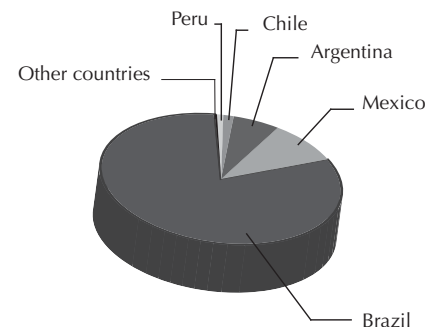
Foreign trade data presents its own difficulties, however. Analysis of official data strongly suggests that large sales of military weapons are occasionally misclassified under product sub-headings that correspond to small arms; in addition, handgun exports are systematically misclassified as hunting rifles and small arms, and ammunition is regularly misclassified as shotgun shells (Dreyfus and Purcena, 2007). Accordingly, the data presented in this section has been adjusted to reflect an estimate of Brazil’s actual exports of small arms items. A complete explanation of the inclusion and exclusion criteria, as well as the raw official data, can be found in the Appendix 1.

Although Brazil is a medium-sized small arms exporter in global terms, it is absolutely dominant in its region, at almost ten times the size of its nearest competitor (see Figure 1.11).

Brazil’s dominance falls into even sharper relief given that a sizeable portion of Chile’s exports are made up of FAMAE sub-machine gun parts made in partnership with Taurus, and that Mexico’s exports are nearly entirely made up of ammunition.

The importance of exports to Brazil’s small arms firms is made clear in their financial statements, which provide information on the breakdown of sales to their three principal markets: the domestic civilian market, Brazilian public bodies (such as the police and the army), and the foreign market (exports). Though not available for all companies for all years, the data shows unequivocally that the Brazilian arms industry is increasingly dependent on exports. Forjas Taurus in particular appears to be essentially an export-driven enterprise (see Figure 1.12). While the domestic civilian and public markets have been avidly protected by Brazilian trade policies, and without doubt provide an important client base, an increasing share of income comes from exports.

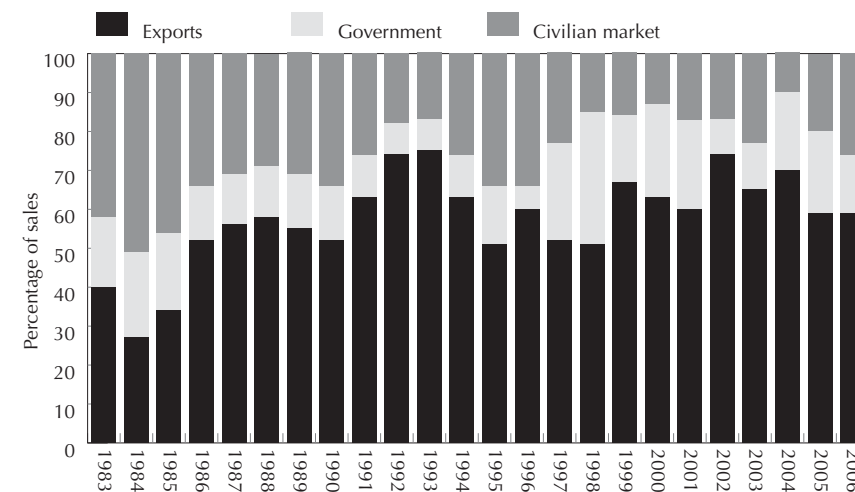
Figure 1.11 **Latin America and the Caribbean: percentage of market share, by exporters of small arms, 2000–05**



Note: Exports from categories HS 9303.30 (sport and hunting rifles) and 9306.21 (cartridges for shotguns) from Brazil to Malaysia in 2002 have been excluded (Comunidad Segura, 2007).

Source: NISAT (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

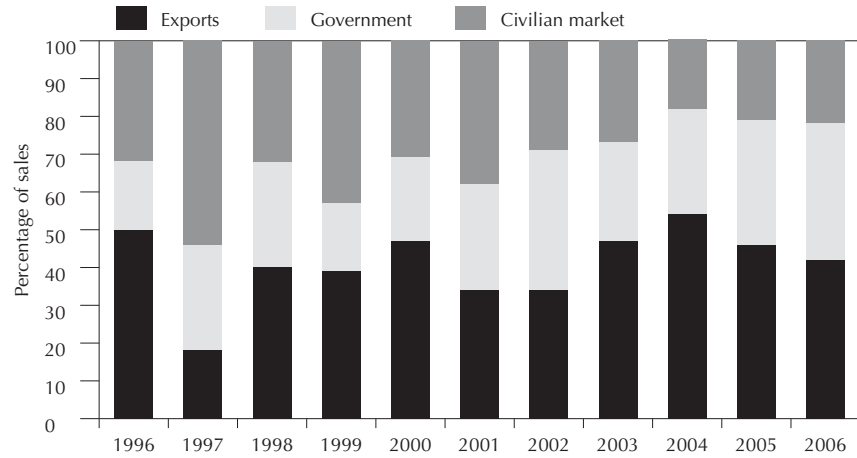
Figure 1.12 **Forjas Taurus: net sales by market segment, 1983–2006**



Note: Data about small arms from IANs and about sales from DFPs.

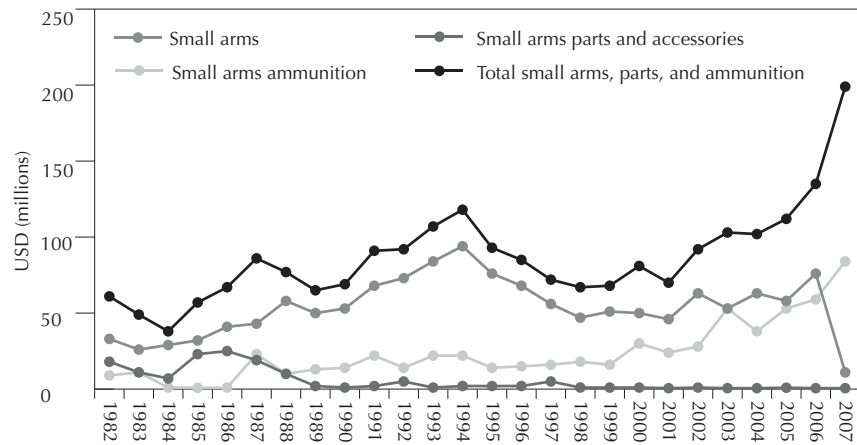
Source: CVM (1995a; 1995b; 2006a; 2006b); analysis by Viva Rio

Figure 1.13 **CBC: net sales by market segment, 1996–2006**



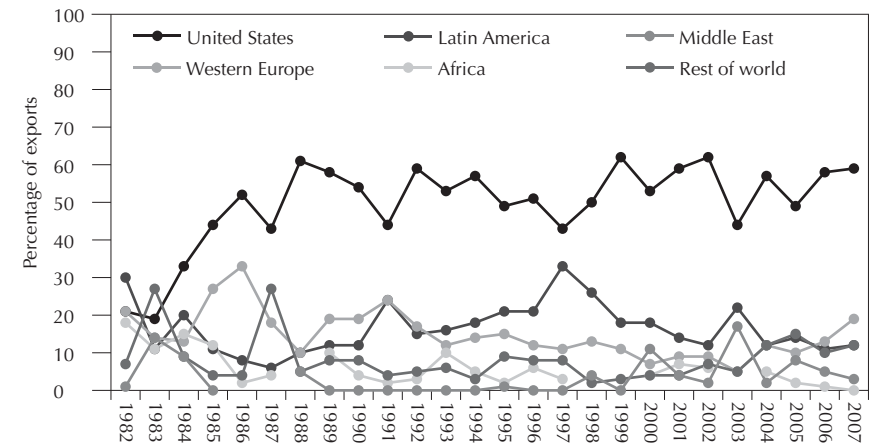
Note: Data about small arms from IANs and about sales from DFPs.
Source: CVM (2006a; 2006b); analysis by Viva Rio

Figure 1.14 **Brazil: small arms industry exports by product, in USD millions (2007 constant), 1982–2007**



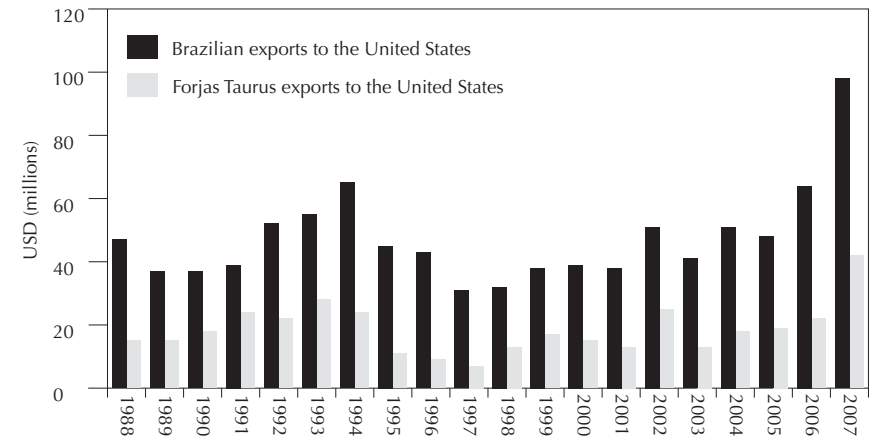
Note: Some exports listed in official data for 1987, 1991–93, and 2002 have been excluded in the light of evidence that they represent military, non-small arms items. See Appendix 1 for details, including a full listing of HS sub-headings for each category listed here.
Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.15 **Brazil: small arms exports, as percentage, by world region, 1982–2007**



Sources: CACEX (1988); SECEX (2007); analysis by Viva Rio

Figure 1.16 **Brazil and Forjas Taurus: small arms exports to the United States, in USD millions (2006 constant), 1988–2006**



Note: Data about small arms from IANs and about sales from DFPs.
Sources: CACEX (1988); SECEX (2007); CVM (1995a, 1995b, 2006a, 2006b); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008) and IGP–DI for 2007 (BCB, 2008); analysis by Viva Rio

CBC, Brazil's only producer of civilian-use ammunition, is also reliant on exports, but not to the same degree; civilian and government demand for ammunition soak up a significantly larger portion of its production (see Figure 1.13).

The relative predominance of small arms over ammunition in arms exports can be clearly seen in Figure 1.14, which provides a time series of Brazilian small arms exports.

Since the late 1980s, the United States has become the principal customer of Brazilian small arms (see Figure 1.15).

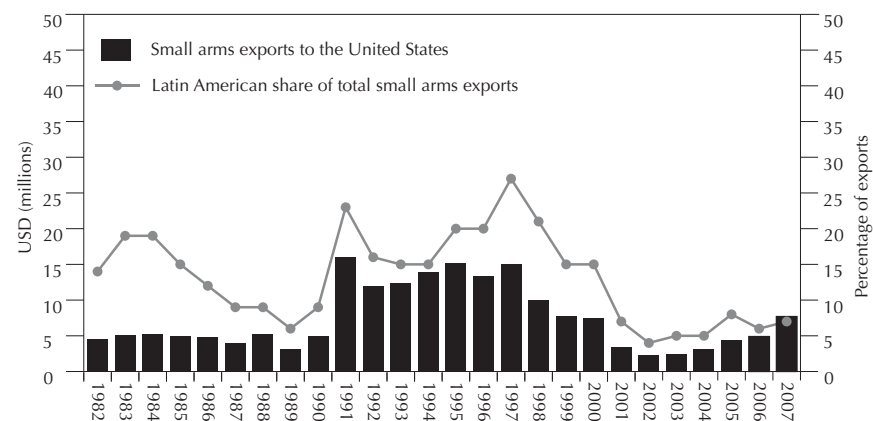
Taurus handguns make up a large proportion of these exports to the United States (see Figure 1.16). Latin America has also been an important market for Brazil, but in recent years the region has ceded importance to the US market. This shift is indicative of a qualitative change in Brazil's small arms industry: a move towards higher-quality, higher-price products with positive name recognition in competitive foreign markets (Dreyfus and Lessing, 2003). Another probable reason for this decrease in exports to Latin America is that in June 2001 the Brazilian Ministry of Development, Industry, and Foreign Trade imposed an export tax (*aliquota*) of 150 per cent on exports of small arms, ammunition, components, and parts to countries in South America, Central America, and the Caribbean, with the exception of Argentina, Chile, and Ecuador (see Figure 1.17). Exports to authorized users with end-user certificates to the armed forces or police institutions of the the region were also exempted (MoDIFT, 2001, 2004; MoJ, 2000, p. 4; Dreyfus and Bandeira, 2006).²⁹

Interestingly, if exports of small arms and parts are separated out from ammunition, the patterns of target markets for exports that emerge are quite different (see Figures 1.18 and 1.19).

The data shows that US imports are made up almost entirely of small arms and parts, while Western Europe has increasingly become a purchaser of ammunition. It is also clear that the market for Brazilian ammunition is much more volatile and variegated than for small arms, as evidenced by the wider variation of top importers of ammunition compared with small arms and parts (see Figures 1.20a-f). Whereas the dominance of the United States has increased among small arms importers, a relative diversification of ammunition importers may be observed.

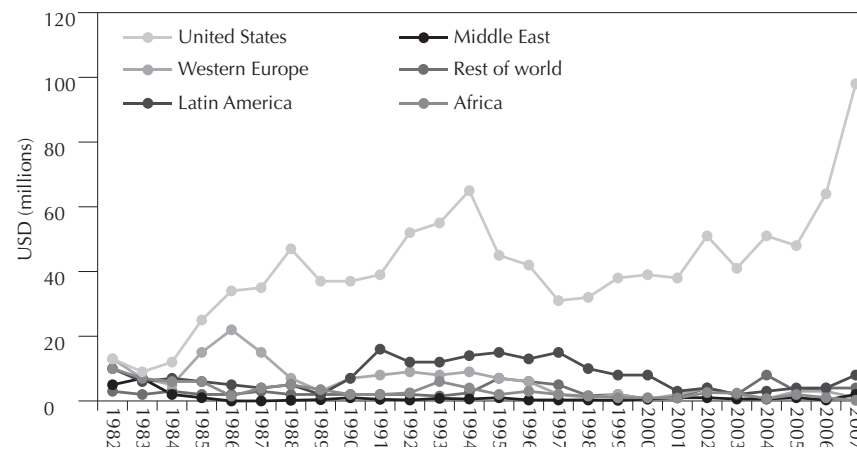
Brazil's neighbour Paraguay has one of the lowest per capita incomes of the region and a population of just 6.2 million. The country is not at war and does

Figure 1.17 **Brazil: small arms exports to Latin America in USD millions (2007 constant) and percentage of total exports, 1982–2007**



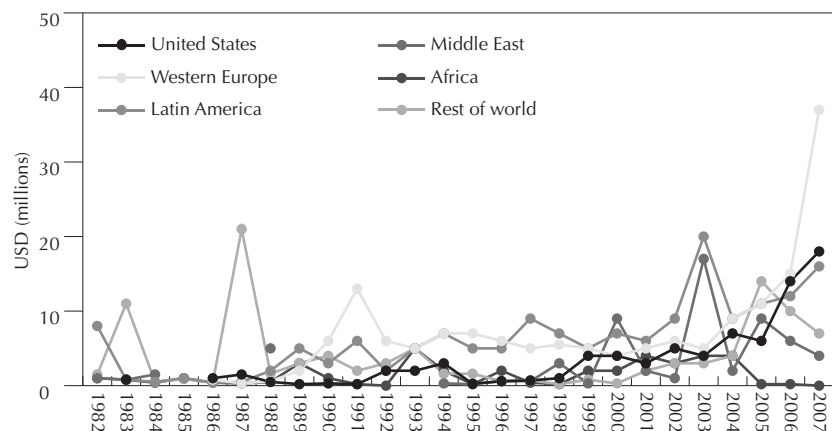
Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.18 **Brazil: destinations of small arms and parts exports by world region in USD millions (2007 constant), 1982–2007**



Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis Viva Rio

Figure 1.19 **Brazil: small arms ammunition exports by world region in USD millions (2007 constant), 1982–2007**

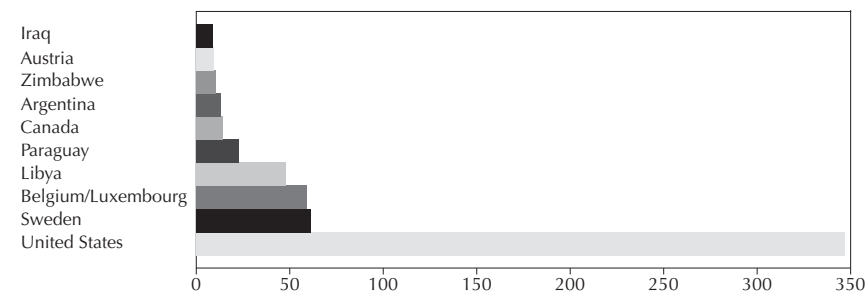


Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis Viva Rio

not register high rates of firearm-related deaths. The volume of small arms imported from 1982 to 1999 far exceeded the country’s needs, offering further evidence of leakage of small arms from the legal to the illicit market in Paraguay. Much of this leakage flowed back into Brazil (Dreyfus and Bandeira, 2006).

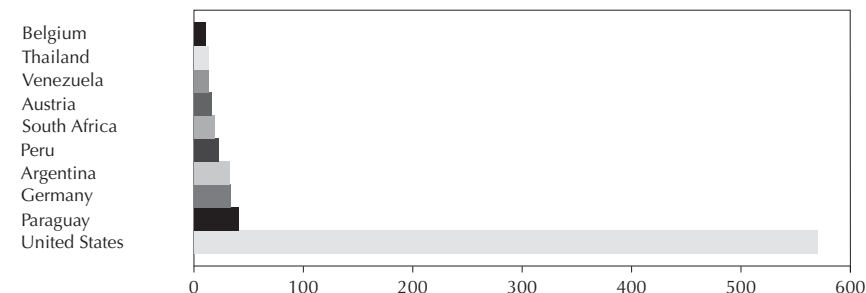
Over the past decade, Paraguayan authorities have shown a greater willingness to regulate and control legal transactions and transfers involving arms and ammunition, partly in response to international pressure. A pivotal year was 1996, when the US government suspended arms and munitions export licences to Paraguay—encouraged by a request for support from the Brazilian government. It was also the year in which Brazil and Paraguay signed a bilateral agreement on the exchange of information about the identity of Brazilians making small arms purchases inside Paraguayan territory. The suspension of US small arms exports to Paraguay led to an increase in the import of Brazilian-made (Taurus and Rossi) pistols and revolvers, but Brazil maintained diplomatic pressure on Paraguay to reduce arms and munitions imports (Dreyfus et al., 2003, pp. 52–53; Lisboa, Aymore, and Fernandes, 2001, pp. 9–10; Dreyfus and Bandeira, 2006). In August 2000, the Paraguayan and Brazilian governments negotiated a moratorium on Brazilian arms and munitions imports.

Figure 1.20a **Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 1982–89**



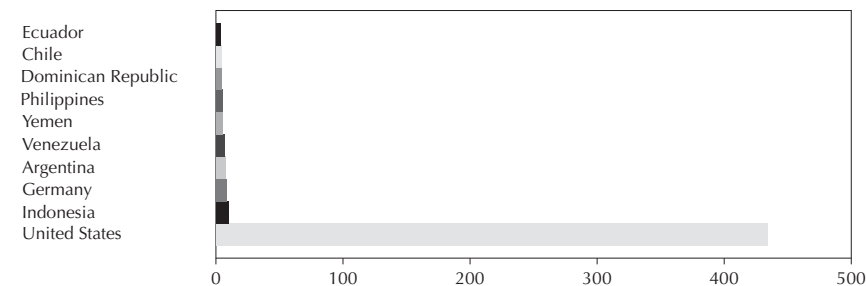
Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis Viva Rio

Figure 1.20b **Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 1990–99**



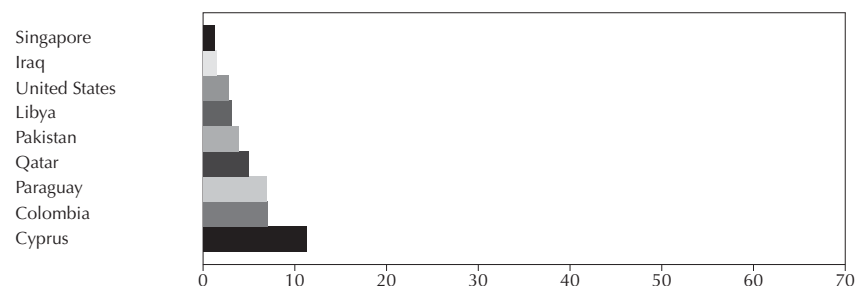
Source: SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.20c **Top ten importers of Brazilian-made firearms and parts in USD millions (2007 constant), 2000–07**



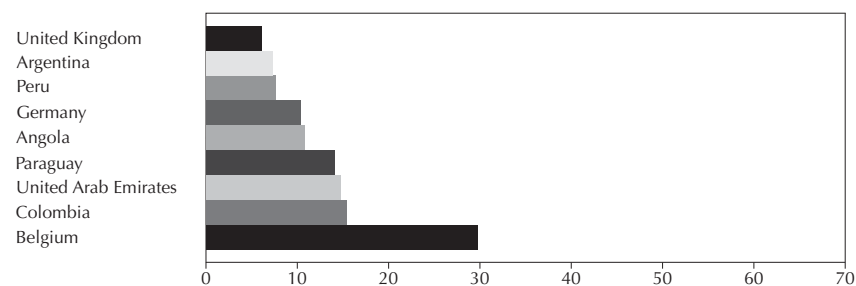
Source: SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.20d **Top ten importers of Brazilian-made ammunition in USD millions (2006 constant), 1982–89**



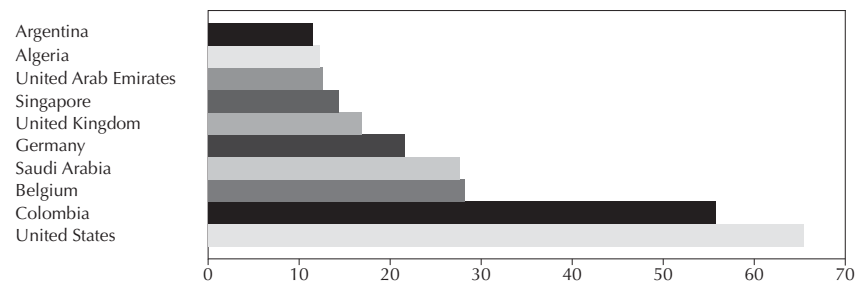
Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.20e **Top ten importers of Brazilian-made ammunition in USD millions (2007 constant), 1990–99**



Source: SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

Figure 1.20f **Top ten importers of Brazilian-made ammunition in USD millions (2007 constant), 2000–07**

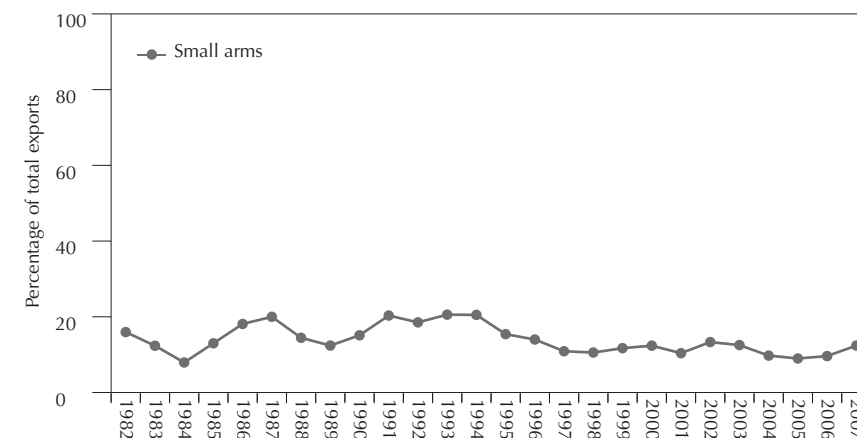


Source: SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

National initiatives to restrict the grey market in Paraguay also played a role. The Ministry of Defence’s War Materials Department (DIMABEL) and the Ministry of Foreign Affairs were the main agencies involved. They aimed to clean up Paraguay’s image as the regional centre for arms trafficking and were also compelled to fulfil commitments made by adopting the United Nations Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects and by signing (in 1997) and ratifying (in 2000) the Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and other Related Materials (CIFTA). In 2002, after intense parliamentary debates, a new small arms control law was approved. Besides enhancing requirements for the purchase of small arms and ammunition by nationals, the new law explicitly bans the purchase of small arms and ammunition by foreigners. Whether due to international pressure or to domestic initiatives, small arms imports have been steadily declining from 1999 onwards, and in particular since 2000, as DIMABEL increasingly denied import licences (Dreyfus et al., 2003, pp. 52–53).

Brazil’s exports to Colombia in the second half of the 1990s may be a reflection of that country’s internal conflict. Interviewed sources report that Indústria Militar (INDUMIL), the Colombian state-owned small arms company, is

Figure 1.21 **Brazil: share of small arms in total exports, 1982–2007**



Sources: CACEX (1988); SECEX (2007; 2008, section of Foreign Trade Indicators and Statistics); analysis Viva Rio

importing CBC ammunition parts in order to complete orders for 9 mm and 5.56 mm cartridges for troops operating in conflict areas.³⁰

In terms of Brazil's national economy, small arms exports make up only a tiny fraction of total exports (see Figure 1.21).

The existence of a massive trade surplus in small arms should not be surprising; it is the desired result of policies designed under military rule. Indeed, the original PNEMEM was geared almost entirely at generating a surplus in the realm of heavy military equipment; small arms were practically an afterthought. Today, the surplus in small arms is well consolidated: Brazil's export niches are relatively secure and its companies command brand loyalty abroad while its heavy arms industry is nearly extinct, and what remains is dependent on occasional large orders.

Conclusion

In his book *Arms and the State: Patterns of Military Production and Trade*, Keith Krause develops a theoretical model for understanding and explaining patterns of arms production and transfers. Taking a historical view at the global level, his work is focused on the defence sector as a whole, with an emphasis on heavy military equipment and weapons. Krause categorizes the structure of arms production and transfers by states in the following way:

- *First-tier suppliers* innovate at the technological frontier.
- *Second-tier suppliers* produce (via technology transfer) weapons at the technological frontier and adapt them to specific market needs.
- *Third-tier suppliers* copy and reproduce existing technologies (via transfer or design), but do not capture the underlying process of innovation or adaptation.
- *Strong customers* obtain (via material transfers) and use weapons.
- *Weak customers* either obtain modern weapons and cannot use them, or do not even obtain them (Krause, 1995, pp. 31–32).

Transfers and production are simultaneously led by three motivating forces:

- The pursuit of wealth.
- The pursuit of power.
- Victory in war (Krause, 1995, pp. 12–33).

In the case of third-tier countries, several secondary motivations drive arms transfers and production:

- To guarantee continued arms supplies to counter security threats.
- To provide a symbol or index of effective regional or international power.
- To catalyse economic modernization efforts.
- To develop local skills and technologies.
- To substitute for imports, saving hard currency and improving the balance of payments (Krause, 1995, pp. 31–32).

In the case of Brazil, two additional secondary motivations may be added:

- Nation- and state-building.
- Realizing a 'manifest destiny' as a regional power.

Brazil and Argentina are the only two countries that succeeded in developing (over the same historical period) important military–industrial complexes. However, only Brazil, in part because of its capacity to conciliate and coordinate the public and private sectors, managed to develop a major export market for, as Patrice Franko-Jones puts it, 'relatively simple, inexpensive, and easy-to-operate [military] machinery' (Franko-Jones, 1992, p. 195; Maldifasi and Abeti, 1994, pp. 108–26, 225–39).

Light tanks, artillery saturation rocket systems, and military training planes were successfully exported during that decade to an international market niche concentrated in the Persian Gulf region. Yet the end of the Iran–Iraq war, macroeconomic constraints, and the lack of substantive state support in the wake of the transition to democracy led to the demise of the export-oriented Brazilian military–industrial complex. At the same time a combination of technological leaps, lack of returns from further heavy weapons exports, and cutbacks in state support frustrated a series of expensive projects (such as the Osório battle tank) that entailed production at the technological frontier. Brazil continued to be a third-tier producer in the field of heavy conventional weapons (Franko-Jones, 1992, pp. 189–247; Krause, 1995, pp. 32, 155). The same applies to military small arms and light weapons. Even IMBEL's successful FAL MD97L model, though in some senses equivalent to (and according to the manufacturers, as good as) the M16, the AR-70, the Galil, and the

FNC, is years away from third-, fourth-, and fifth-generation assault rifles such as the XM-8/G-36 (Germany) or the Tavor (Israel); the latter small arms incorporate state-of-the-art technology such as modular polymer parts, red point sights, and 'Rail Interface Systems'.³¹

The case of handguns is somewhat different. While the Brazilian handgun producers were not as dependent on advanced technology as other defence sectors, they were able to 'hitch a ride' on the so-called economic miracle sparked by Brazil's growing arms industry during the 1980s. By the 1990s, Brazil had lost its edge in heavy conventional arms but was well established as a mid-sized global player in the international small arms market. The small arms industry in Brazil appears to have achieved sustainability for the mid-to long term thanks largely to demand from the civilian and police markets—above all in the United States—which is more stable and reliable than the sporadic purchase cycles typical of heavy military weapons. Indeed, in the enormous US market, Taurus has secured a market niche for good quality pistols and revolvers at competitive prices.

While most transfers of Brazilian small arms are for civilian and police use, technological advances also play a defining role in the market:

Although the civilian market is certainly the largest part of the global small arms business, accounting for more than 80 per cent of annual production, it is innovation in the military market that generally defines the cutting edge of small arms technology (*Small Arms Survey*, 2003, p. 21).

The application of technological advances in the military field to arms for the civilian market allows Krause's theoretical considerations for military production and trade to be adapted to the specific sector of handguns. As discussed above, Taurus (the leading company and exporter) adopted all of the important innovations in military side arms to its production of civilian-use handguns during the second half of the 1990s:

- Reliable safety systems.
- The production of lighter and compact models.
- The use of polymer-based materials.
- The introduction of light materials such as titanium and composites.

The company was also able to introduce good-quality new products at competitive prices into the US market. At present, Brazil is the only sizeable Latin American producer of small arms for civilian and police markets that has mastered the technology of polymer, plastic composites, and titanium handguns. In this particular market with few technological constraints, Brazil has the potential to evolve from a third-tier producer into a second-tier producer.

While it is tempting to deduce that the small arms industry succeeded where the heavy arms industry failed, such a conclusion would obscure the differences in the two markets. Brazil had not intended to export heavy military weapons to the United States—and yet today its small arms industry is deeply dependent on US importation of its products. Moreover, the majority of those imports are clearly destined for sale in the US civilian market, which represents a source of steady demand compared with the periodic purchase cycles of military and police clients at home and abroad. For this reason, it is difficult to believe the warnings of impending bankruptcy from Taurus in the face of increasing domestic small arms controls in Brazil. Neither is CBC at great risk, in spite of its greater dependence on the domestic market, since most of its sales go to a captive and protected public security market.

On the other hand, the basic tenets of the NSD have in some ways played out in the case of Taurus and CBC. Both were able to obtain know-how from periods of foreign ownership, both were renationalized (in the case of CBC through public financing), and both now enjoy—albeit to different extents—high profits from sales on the export market, which they can use to obtain efficiencies of scale and to finance further research and development. Of course the central tenet of the NSD has meanwhile failed spectacularly: success for these private arms firms has not translated into national economic development, much less security. Indeed, if the connection between small arms proliferation and violence explored in a previous *Special Report* is any indication, Brazil has paid all too dearly for the success of these firms (Dreyfus et al., 2008). ■

Appendix 1

Sources and methodological obstacles

With the coming of civilian rule, the ability of the military to interfere in economic matters has diminished significantly. Nevertheless, the Controlled Substances Act (R-105) gives the Ministry of Defence authority over all aspects of trade involving small arms (among other items), and it has used this authority to promote the Brazilian arms industry at home and abroad wherever possible. One of the ways it has done this is through control of information; data on arms production and sales—which the Army is legally obligated to collect—is not public.

Other important obstacles and methodological issues impede the use of available data sources. For the sake of clarity, this appendix examines production and sales data separately from foreign trade data, which is subject to distinct concerns.

Patrice Franko-Jones also encountered problems while studying overall arms exports (heavy and light):

Armament exports are difficult to report because, in addition to being secret, [military] deals are customarily signed for a multi-year period. [...] Official Brazilian sources for defence exports data can be used as an indication of the export capability of the firms, albeit with caution. [...] Numbers published by CACEX, the export agency of the Bank of Brazil, are difficult to interpret because of the nomenclature used to identify products. For example, according to CACEX, ENGESA does not export tanks but rather trucks. Exports are not designated by civilian or military type (Franko-Jones, 1992, pp. 141–42).

In one of the first attempts to systematically understand Brazil's small arms exports, Marcos Lisboa, Ramon Stubert Aymore, and Rubem César Fernandes note serious discrepancies in the way handguns are classified by the Brazilian Foreign Trade Secretariat (SECEX) (Lisboa, Aymore, and Fernandes, 1999, p. 12). These discrepancies are discussed below.

Conscious of the 'sensitive' nature of the data, the authors of this study followed the advice and methods of their predecessors, analysing what data

was available in an attempt to answer some of the questions raised by previous studies and in the hopes that this methodological appendix will be of service to future researchers on this topic.

Production and sales data

Economic surveys

As mentioned in the section on obstacles in Chapter 2, the only available sources on overall production and sales are government surveys of the economy. These have only recently become consistent and sufficiently disaggregated to permit useful time series analysis of small arms production and sales.

The relevant surveys are:

- Pesquisa Industrial Anual (Annual Industry Survey, PIA).
- Economic Census–Industrial Census.
- Brazilian National Accounts System–GDP by sector.

The PIA, a panel survey of producers, employs the National Classification of Economic Activities, or CNAE, based on the International Standard Industrial Classification. The PIA–Product (PIA–*Produto*) has been undertaken since 1998, while the PIA–Enterprise (PIA–*Empresa*) began in 1996. Prior to this, the PIA survey aggregated all information at an even higher level, lumping small arms in with all 'machinery and equipment'.

For information on the period before 1996, researchers must turn to the Economic Census, which suffers from grave limitations. Carried out sporadically since 1920, the census aggregated small arms with cutlery and hand tools until 1950. The data on small arms from 1950 to 1985 is usable, but the ammunition data is aggregated together with gunpowder and explosives from 1950 to 1975, and while it is disaggregated from 1980 to 1985, it is confidential. The upshot is that the only available and usable data is for small arms in the years when the census was carried out: 1950, 1960, 1970, 1975, 1980, and 1985. The 1990 census was cancelled and was thereafter replaced by the PIA, leaving a gap between 1985 and 1998.

This problem of aggregation is even more acute with wholesale and retail sales as measured by the merchant survey. Survey data on small arms is aggregated with numerous non-small arms items, from watches to optical prod-

ucts. While disaggregated data may exist, none could be accessed for this study. As a result, no merchant data was consulted.

Another problem related to confidentiality is the need to protect individual companies' anonymity in government surveys. When a given product has only a single producer, as is the case with handguns and civilian-use ammunition, production and sales values are not divulged. As a result, there are totals for the category 'arms and ammunition' (which includes parts) but no breakdown by small arms, parts, and ammunition.

Company reports

Another important source of information on production and sales are the company financial reports on file with the CVM. The CVM lists filings for all publicly traded companies, which include Taurus, CBC, and Rossi, but exclude IMBEL, Boito, and other small producers. Yet both Rossi³² and CBC³³ retreated from the open stock market in 2002 and 2007, respectively. This will place limits on the availability of information for future studies. There are two types of records on file:

- annual reports (*informações anuais*, IAN): company history and information, principal products, market share, main markets, subsidiaries, employment, stockholder profile.
- standardized financial statements (*demonstrações financeiras padronizadas*, DFPs): net and gross revenue, costs, profits, and administration report.

Some CVM data is available online at <<http://www.cvm.gov.br/>>.

Deflators

All values in *reais* were deflated using the general price index–internal supply (*índice geral de preços–disponibilidade interna*, IGP–DI) of wholesale and retail prices. Since Brazil's small arms firms sell both to retailers and directly to consumers, it was felt that a mixed price index would better reflect the reality of small arms sales.

Foreign trade

At first glance, foreign trade data appears to be much better than production and sales data. Fully disaggregated data by product sub-heading and country is available for the years 1989–2007 via SECEX. Data for previous years, in this case 1982–89, was accessed through the Bank of Brazil's Foreign Trade Bureau (Carteira de Comércio Exterior–CACEX).

The first step is to decide which product sub-headings to include in small arms counts. There is no perfect fit between the United Nations definition of small arms and the headings and sub-headings of the Harmonized Tariff Schedule (HTS). Brazil currently uses a regional version of the HTS, the Mercosur Common Nomenclature (NCM). Until 1996, Brazil had used the Brazilian Merchandise Nomenclature (NBM), with no significant differences in the headings. A previous version of the NBM was used for data from 1982 to 1988. Sub-headings that probably include exclusively small arms are included (see shaded rows in Table A1.1), whereas those thought to include small arms as well as non-small arms items are excluded.

Misclassification of data: missing handguns

The problem of inclusion is particularly grave in the case of Brazil due to what can only be described as the systematic misclassification of exports by Brazilian authorities. By law, Brazilian exports of small arms are channelled through the Army, which issues export licences and forwards export data to the Treasury. While it is impossible to know whether these inconsistencies are deliberate, it is possible that the Army is trying to protect the exports of small arms firms with which it has a historical connection.

The prime example of misclassification concerns a case of missing handguns. Brazil exports more than USD 25 million per year in handguns to the United States, yet there is a consistent lack of entries in the customs heading corresponding to handguns (9302). Meanwhile, US data clearly shows the handgun imports.

It seems plausible that Brazilian authorities 'hide' handgun exports under the sub-heading 9303.30, a catch-all for other long arms, such as hunting rifles and shotguns. In an official letter to Viva Rio, the Treasury acknowledged a discrepancy but could not explain it. This sub-notification is even clearer in Figure A1.1, which compares Brazilian 'hunting rifles and shotguns' exports with US imports of handguns from Brazil.

Misclassification of data: the USD 500,000 hunting rifle

Although it is a serious problem, the type of misclassification mentioned above does not affect total reported values for small arms. A much more seri-

Table A1.1 HTS sub-headings*

Heading	Sub-heading	Articles
93.01		Military weapons, other than revolvers, pistols, and the arms of heading 93.07
	9301	Artillery weapons (for example, guns, howitzers, and mortars)
	9301.11	Self-propelled
	9301.19	Other
	9301.20	Rocket launchers, flame-throwers, grenade launchers, torpedo tubes, and similar projectors
	9301.90	Other
93.02		Revolvers and pistols, other than those of heading 93.03 and 93.04
93.03		Other firearms and similar devices that operate by the firing of an explosive charge (for example, sporting shotguns and rifles, muzzle-loading firearms, pistols and other devices designed to project only signal flares, pistols, and revolvers for firing blank ammunition, captive-bolt humane killers, line-throwing guns)
	9303.10	Muzzle-loading firearms
	9303.20	Other sporting, hunting, and target-shooting shotguns, including combination shotgun-rifles
	9303.30	Other sporting, hunting, and target-shooting rifles
	9303.90	Other
93.04		Other arms (for example, spring, air, or gas guns and pistols, truncheons), excluding those of heading 93.07
93.05		Parts and accessories of articles of headings 93.01 to 93.04
	9305.10	Of revolvers or pistols
	9305.20	Of shotguns or rifles of heading 93.03
	9305.21	Shotgun barrels
	9305.29	Other

	9305.91	Of military weapons of heading 93.01
	9305.99	Other
93.06		Bombs, grenades, torpedoes, mines, missiles, and similar munitions of war and parts thereof; cartridges and other ammunition and projectiles and parts, including shot and cartridge wads
	9306.10	Cartridges for riveting or similar tools or for captive-bolt humane killers and parts thereof
	9306.20	Shotgun cartridges and parts thereof; air gun pellets
	9306.21	Cartridges
	9306.29	Other
	9306.30	Other cartridges and parts thereof
	9306.90	Other
93.07		Swords, cutlasses, bayonets, lances, and similar arms and parts, and scabbards and sheaths

Note: * Shading indicates inclusion in this study.

ous problem was encountered in the data that reflects sporadic inclusion of non-small arms items in sub-headings that refer to small arms items, a practice that threatens to invalidate the data set in its entirety. This issue can best be illustrated through examples.

If the inclusion guidelines mentioned above are applied for all years, the total small arms, ammunition, and parts exports rose to USD 146 million in 2002, a 141 per cent rise over the previous year and a major outlier in an otherwise stable time series (see Figure A1.2).

SECEX data includes information on net weight and, under some sub-headings, quantity. It is thus possible to search for anomalies in line items. Table A1.4 reveals an almost humorous line item under the subheading 9303.30, 'other long arms'.

Only a rather exceptional hunting rifle would cost USD 486,999 and weigh more than 6,000 kg. Moreover, sources such as the Stockholm International Peace Research Institute (SIPRI) and even the Brazilian Ministry of Foreign Affairs confirm that Brazil sold an AVIBRAS missile system to Malaysia at the end of 2001. While parts of this system showed up in the sub-headings for military artillery (in itself odd, considering that all military weapons sub-headings had been zero between 1989 and 2001), it appears that part of the system had been misclassified.

In as clear a case as this the line item may simply be eliminated. Yet elsewhere no unit information was available, as was the case for the USD 41 million shotgun shells that Malaysia imported (9306.21). Given the circumstantial evidence, and the fact that Malaysia had never imported anything near that amount of shotgun shells in previous years, this study eliminates all exports to Malaysia from 2002 totals.

A similar problem became apparent in other years. Figure A1.3 shows high peaks in the late 1980s and early 1990s. To 'clean' the data of misclassified non-small arms items, it was useful to compare SIPRI's data on major weapons systems transfers for the period studied with the CACEX and SECEX trade data, searching for similar suspect entries. Anomalously large entries under the same two sub-headings (9303.30 and 9306.21) were found for exports to Saudi Arabia and Qatar between 1987 and 1993; these corresponded to values for missile systems reported by SIPRI. Because of the close correspondence between reported delivery dates, purchase price, and the line items flagged, these values were eliminated from this study's data set. Other

Table A1.2 Brazilian exports, 1997-2002

NCM code	Description	Country	1997	1998	1999	2000	2001	2002
93020000	Revolvers and pistols	United States	0	0	0	0	0	0
93032000	Sporting/hunting shotguns	United States	14,357	14,436	67,361	67,684	91,799	144,241
93033000	Sporting/hunting rifles	United States	168,486	162,875	177,486	173,882	154,489	234,877

Source: SECEX (2007; 2008)

Table A1.3 US imports for consumption, 1997-2002

HTS sub-heading	Description	Country of origin	1997	1998	1999	2000	2001	2002
93.02	Revolvers and pistols	Brazil	180,895	138,489	156,042	160,548	135,267	229,288
9303.20	Rifles, carbines, and shotguns	Brazil	17,736	13,370	64,144	55,605	77,109	118,780
9303.30	Other firearms, between \$25 and \$50	Brazil	32,746	26,099	22,027	31,486	28,644	39,520

Source: USITC (2008)

cases where misclassification may have occurred were left intact for lack of conclusive evidence; in all of these cases, the values involved were not large enough to distort the data. Table A1.5 summarizes the eliminated values.

After the removal of the suspected non-small arms line items, the curve becomes more intelligible (see Figure A1.4). It is this data set, with the scale adjusted slightly, that is presented in this chapter.

Deflators

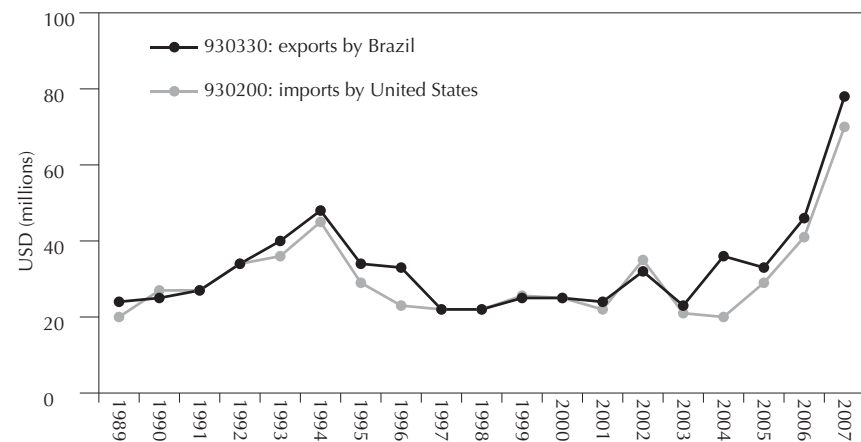
For foreign trade data, USD values were deflated using the Implicit Price Deflators for Gross Domestic Products at 2006 values.

Estimated total annual units produced by Taurus and CBC

The producers section of this chapter presents time series estimating the total unit production of small arms in the case of Taurus, and ammunition in the case of CBC. The methodology used to arrive at these estimates follows.

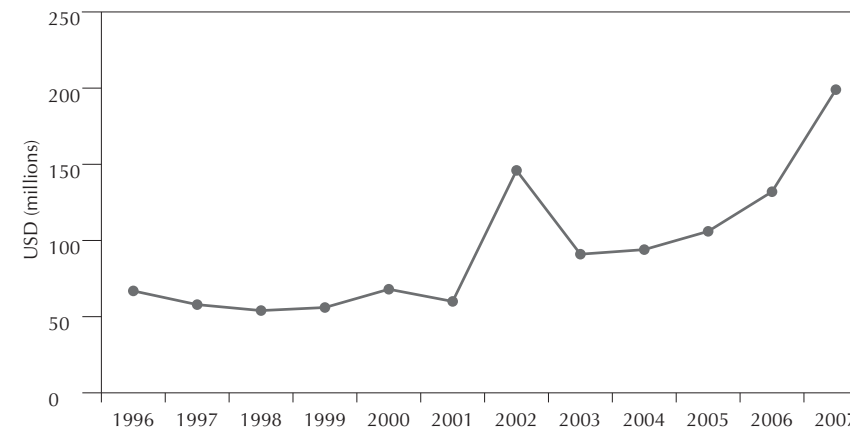
As noted in the chapter, no data is available on production for individual companies. Production data in value terms for the industry as a whole is available from the PIA for the years 1998–2005, while a longer data set on pro-

Figure A1.1 **Brazilian exports under 9303.30 vs. US imports under 9302, in USD millions (at current values), 1990–2007**



Sources: SECEX (2007); USITC (2008); analysis by Viva Rio

Figure A1.2 **Brazil: small arms, ammunition, and parts and accessories, in USD millions, 1996–2007**



Source: SECEX (2007); analysis by Viva Rio

Table A1.4 **The USD 500,000 hunting rifle**

Exports 2002	Quantity	Kg	USD	USD/unit
USA	234,877	302,888	32,144,460	137
Malaysia	51	337,298	24,836,962	486,999

Source: SECEX (2007)

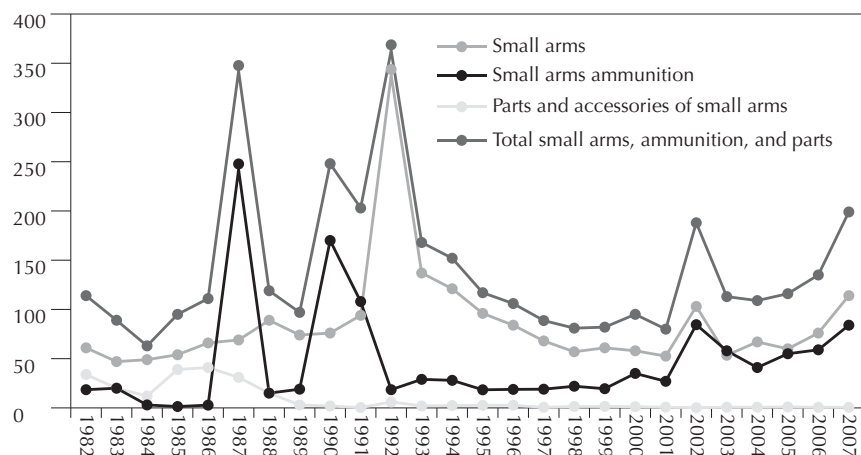
duction data in unit terms is available in the Army’s Statistical Annexe but presents lacunae and other problems. Extensive financial data for two of the largest Brazilian small arms firms³⁴ is available from the CVM, however. In their company reports to the CVM, Taurus and CBC provide the following items (among others):

- Value of total sales (net revenue).
- Value of inventory at year end.

For Taurus, this data is available from 1983 to 2006; for CBC, only the years 1987–2003 are available. With this data, along with estimates of average price per unit, unit production could be estimated for these years.

The first step is to estimate the value of annual production. To arrive from the value of sales to the value of production, the authors took the value of

Figure A1.3 **Brazil: small arms, ammunition, and parts and accessories exports by type in USD millions (2007 constant), 1982–2007**



Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio

sales plus the change in the value of stock at the end of the year considered over the end of the previous year:

$$\text{Value of production} = \text{Net revenue} + \Delta \text{ Value of inventory}$$

where $\Delta = \text{Value of inventory (current year)} - \text{Value of inventory (previous year)}$

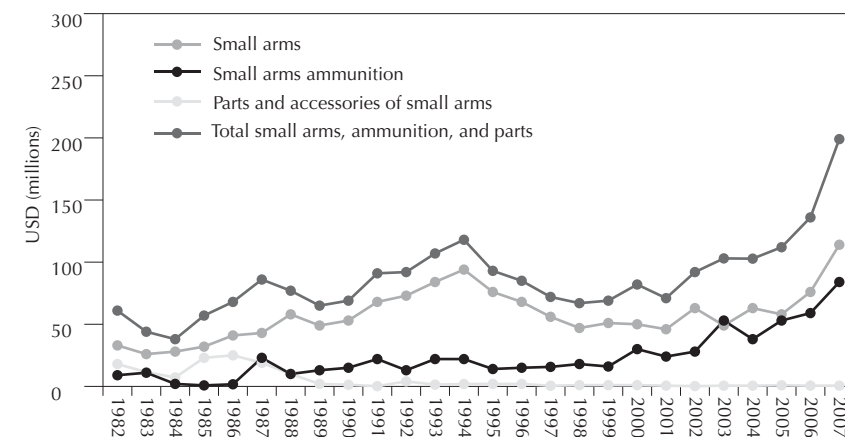
Having arrived at an estimate of the value of yearly production, the next step was to divide by average unit price to arrive at yearly unit production. No data on average price was available, however. In fact, information on sales

Table A1.5 **Suspected non-small arms line items removed from small arms export totals, USD current**

Im-porter	Sub-heading	Export totals (USD)				
		1987	1990	1991	1992	1993
Saudi Arabia	9303.30				121,720,320	14,929,920
	9306.21	79,227,808	68,999,000	34,179,840		
Qatar	9303.30				6,366,975	
	9306.21		2,028,600	5,796,000		
Total		79,227,808	71,027,600	39,975,840	128,087,295	14,929,920

Sources: SECEX (2007; 2008); CACEX (1988); SIPRI (2008)

Figure A1.4 **Brazil: small arms, ammunition, and parts and accessories exports (corrected) by type in USD millions (2007 constant), 1982–2007**



Sources: CACEX (1988); SECEX (2007); value updated based on Implicit Price Deflator US–GDP for 2007 (USBEA, 2008); analysis by Viva Rio.

per model or type of firearm is almost entirely lacking, especially for small arms of restricted use in Brazil.

Prices were researched in the following stores: Castro Sport³⁵ in São José do Rio Preto (São Paulo); Pau de Fogo, Firearms, Ammunition, Camping, and Fishing supply Ltda.³⁶ in Curitiba (Paraná); Falcon Firearms³⁷ in Curitiba (Paraná); and Pegasus Security Supply³⁸ in Curitiba (Paraná). Forty-three different models of revolvers and pistols were found, yielding 60 price observations. Based on these observations, the average price of Taurus small arms was estimated to be BRL 520.18. The production value was divided by the average price to determine a produced quantity. It is important to point out that the values of stock and of sales were deflated.

The aim was to create average price estimates for ammunition as well, but in practice it was impossible due to the absence of information from the factory. Some information on current unit production was available from CBC, however, allowing for an estimate of current-year production. CBC's corporate website provides information on its daily production of ammunition by type. Multiplying by 252 (the number of workdays in Brazil) yields an estimate of total annual production by type (see Table A1.6).

Table A1.6 **Estimated total annual units of ammunition produced by Taurus and CBC (as of January 2005)**

Type of cartridge	Daily production	Annual production
Military	106,000	26,712,000
Centre fire	750,000	189,000,000
Rim fire	320,000	80,640,000
Hunting	160,000	40,320,000
Total	1,336,000	336,672,000

Source: CBC (2008)

The total current year unit production was then divided by the value of production to arrive at an average price estimate of BRL 0.54. Dividing through for previous years' value of production yielded an estimate of unit production for each year.

Admittedly, these unit production estimates are subject to methodological limitations. They are composite estimates based on further estimates of value of production and average price. Much key data was simply not available, and it was not possible to construct average price estimates for each year studied. Worse, in constructing the average price estimates, the relative weight of different products within overall sales was not known; the average price of all observations had to suffice.

For these reasons, production estimates should be considered rough guidelines of the approximate production capacity of these firms.

Endnotes

- 1 In the Federal District 17,823 small arms were seized in 1990–2006; more than 83 per cent of these small arms were Brazilian-made. In Rio de Janeiro more than 78 per cent of the 78,011 small arms seized in 1998–2003 were produced in Brazil. In São Paulo, 43,266 small arms were seized in 1998–2003, with more than 85 per cent manufactured in Brazil. The data of the Federal District has been updated with new information received by the Small Arms Control Sub-Commission of the House of Representatives of the Brazilian Congress.
- 2 These sources may be divided into four types: data on the Brazilian economy from the Brazilian Institute of Geography and Statistics (IBGE), data on foreign trade from the Brazilian Foreign Trade Secretariat (SECEX), company information from the Securities and Exchange Commission of Brazil (CVM), and data on domestic production and trade from the Statistical Yearbook of the Army (AnEEEx). A more detailed treatment of these sources, problems encountered with the available data, and solutions adopted can be found in the methodological appendix to this chapter.
- 3 For more information, see the company websites: E.R. Amantino (n.d.); CBC (n.d.); Rossi (n.d.).
- 4 See the company website: Taurus (n.d.).
- 5 INA was closed by the military after the 1964 coup, apparently because of grievances between the owner and the military government. Interview with Amílcar Damaso, gunsmith, and owner of Guntec: Tecnologia em Armamento, Rio de Janeiro, July 2004.
- 6 The view among the military that the small arms industry must be controlled (and protected) by the Army prevails to this day: the 2000 version of R-105 forbids or restricts the importation of any controlled product that is manufactured domestically, including small arms. Imports will only be authorized in special circumstances and with special authorization granted by the Army. See Ministério da Defesa (2000).
- 7 The name of this institution was changed in 1982 to Banco Nacional de Desenvolvimento Econômico e Social, or BNDES.
- 8 Interview with Col. (R1) Roberto Guimarães de Carvalho, president director of the Brazilian Defence and Security Industries Association, the interest group representing Brazil's defence companies, São Paulo, May 2004. Guimarães de Carvalho is also the president of AVIBRAS Indústria Aeroespacial S.A., a company specialized in the production of rocket artillery systems.
- 9 One example of these links is the fact that, after six years as head of the Army's Directorate of Controlled Products, charged with monitoring and authorizing small arms production and trade, Brig.-Gen. Antônio Roberto Nogueira Terra retired and became a special consultant to Forjas Taurus through the private consulting firm Sulbras Consultoria e Assessoria Ltda, which represents Taurus in Brasília. In the midst of an intensive debate over the regulation of the new small arms control law, this was the subject of a major press scandal (Miranda, 2004).
- 10 The total production amount listed is USD 148.4 million (BRL 361,379,607 current), and includes pistols, revolvers, shotguns, carbines, and all other non-military small arms; ammunition and cartridges for such weapons; and parts, accessories, and services related to

these items. In addition, the survey lists USD 8.9 million (BRL 21,739,760 current) under another heading, 'heavy military equipment', which includes military arms (armas de guerra), bombs, grenades, and other projectiles; armoured combat vehicles; and parts, accessories, and services related to these items. Some of these items, particularly assault rifles, grenades, and mortar ammunition, may fall into the category of small arms (IBGE, 2007d). The average exchange rate in 2005 was USD 2.45 to the Brazilian real.

11 The rate of export is considered in relation to sales, which reached USD 109,776,589 (current value) in 2005 (SECEX, 2007), divided by total sales, converted to dollars by the average market price of 2005, USD 158.8 million (BRL 386,590,257 current) (IBGE, 2007d).

12 Unless otherwise noted, the source of information on this company section is an interview with Col. (R1) Alte Zylberberg, superintendent of the Itajubá Factory, Itajubá, May 2004.

13 For more information, see IMBEL (n.d.).

14 Interview with IMBEL officials, February 2008.

15 The data is from the Brazilian economic journal *Gazeta Mercantil*.

16 Interview with Col. (R1) Alte Zylberberg, superintendent of the Itajubá Factory, Itajubá, May 2004. IMBEL sources confirmed that as of February 2008 this information was still accurate, at least for the .45 pistols.

17 Information provided by the Brazilian Army's Directorate of Controlled Products (DFPC).

18 See Taurus (n.d.).

19 See Gangarosa (2004).

20 Interview with small arms expert and importer Fernando Humberto Fernandes, July 2003.

21 A sample of comments of US consumers referring to Taurus products as 'excellent' and 'affordable' are included in the following specialized product reviews: Quinn (2002) and Kokalis (2002).

22 For a complete explanation of the method used to create this estimate, see the methodological appendix to this chapter.

23 Information provided by the DFPC.

24 See E.R. Amantino (n.d.).

25 For most of its history, the Census included ammunition in a larger group of products including safety matches and industrial explosives.

26 'Permitted-use' refers to all calibres of small arms and ammunition permitted for use by civilians according to Brazilian law, such as .22, .32, .38, and .380 calibre handguns, shotguns, and hunting rifles (excluding semi-automatic military-style rifles that can only be held by specific groups of civilian holders, such as sports shooters, hunters, and collectors).

27 Survey respondents report quantity produced, quantity sold, and total value of sales. The PIA-Product report includes only total value of sales, but divides it by quantity sold to arrive at average price, then applies this average price to quantity produced.

28 According to the Statistics of the Central Register of Enterprises survey, companies employed 32 million workers in Brazil in 2005 (IBGE, 2007b).

29 This export tax was levied to prevent the export of Brazilian weapons to areas or countries where there was a risk of diversion to crime or conflict settings. Argentina and Chile were exempted because of their strict gun control laws and policies. Chile and Ecuador are the only two Latin American countries that do not share borders with Brazil. The measure was

specifically targeted at Paraguay, however, which was the second-largest importer of Brazilian-made small arms in the 1990s (after the United States). This information is partly based on interviews with gun shop owners in Melo and Rivera (Uruguay, January 2006) and Asunción (Paraguay, December 2005).

30 Interview with a ranking official of INDUMIL's sales department, Bogotá, July 2003.

31 For a detailed comparison of the MD97L and LC with second-, third-, fourth-, and fifth-generation assault rifles, and for an analysis of current and future technological trends in assault rifles, see Beraldi (2004) and Small Arms Survey (2003, pp. 22–24).

32 For more information, see Rossi (2002).

33 For more information, see CBC (2007).

34 Rossi also files reports with the CVM, but these reports lack key information needed to build unit production estimates. Yet Rossi has always been small in comparison to Taurus, even before its handgun production was bought out by Taurus.

35 See Castro Sport (n.d.) (in Portuguese).

36 See Pau de Fogo (n.d.) (in Portuguese).

37 See Falcon Armas (n.d.) (in Portuguese).

38 See Grego Esporteds (n.d.) (in Portuguese).

Chapter 2

Small Arms and Light Weapons Holdings in Brazil: Towards a Comprehensive Mapping of Guns and Their Owners

Pablo Dreyfus and Marcelo de Sousa Nascimento

Introduction¹

Brazil is affected by an epidemic of violence whose primary risk group is young men aged 15 to 29 who have not completed their primary school education (Small Arms Survey, 2007). The violence is concentrated in mid-sized and large urban areas, and small arms are central to this violence (Small Arms Survey, 2007, pp. 227–55). Chapter 1 of this publication reveals that Brazil is the second-largest producer of small arms in the western hemisphere and that small arms production boomed in the very same decade during which violence started to rise. Based on the brief analysis of regulations on gun registration in this chapter, it is also clear that small arms control has been chronically inefficient.

If armed violence in Brazil is seen as an epidemic, with small arms as the vector of transmission, it becomes very important to understand the distribution of this vector—small arms holdings—across Brazilian territory. The relationship between violence and small arms availability can only be appreciated with a better understanding of the location, holders, and types of weapons in Brazil. This study seeks to promote that understanding.

A weapon's potential destructive impact is not only determined by its power, firing range, and rate of fire; its geographical and socio-economic environment is also relevant. For example, the small arms-related problems of a sparsely populated rural area with a high concentration of single-shot guns and revolvers is likely to differ from those of a densely populated megalopolis with a high concentration of semi-automatic pistols and military-type small arms used in criminal or informal circles. This study therefore places an emphasis on the collection and analysis of data about the type of weapon that is predominant in each Brazilian state; it also focuses on the rural–urban distribution of these firearms. The study relies on a combination of interviews²—including with members of the

security forces in a majority of states across Brazil—and the collection of quantitative data on registered, seized, sold, and collected or destroyed small arms.

As is the case with small arms production (see Chapter 1), research on holdings is complicated by poor quality as well as incomplete or confidential data sources. The decentralization of data from federal to state governments has contributed an additional problem: the underreporting of data from state to federal authorities.³ As a result, and given Brazil's federal nature and its size, the gathering of data is relatively time-consuming.

The chapter is divided into three parts. First, it reviews the obstacles encountered in compiling the data, considering the regulatory framework and its application in practice. Second, it maps out selected small arms holdings and describes the methodologies used to arrive at estimates for each category. These are divided into state holdings and private holdings; the latter group includes both legal and illicit holdings. Third, it offers an analysis of the data on small arms according to geographical distribution with a view to revealing state-by-state and rural–urban distribution patterns.

Among the key findings of the research are:

- There are 17 million small arms in Brazilians hands.
- Illicit holdings account for about 56 per cent of the total.
- Seventy-three per cent of the legal small arms are privately held by individuals and companies.

Obstacles

The regulatory framework

The very first national regulation on small arms was enacted in 1934 and entered into force two years later. While the decree organized and regulated small arms production and foreign trade, it did not deal directly with domestic sales or registration of small arms; it merely gave vague guidelines from the Ministry of the Army⁴ to arrange for state authorities to register weapons. The purchase and use of firearms by civilians remained unregulated until 1980, when the Ministry of the Army introduced regulations establishing the number and type of weapons that civilians over 20 years of age could purchase, and introducing mandatory registration of those weapons as a precondition of pur-

chase. Small arms were registered with the civilian police of each state, but there was no national institution in charge of centralizing the data on firearms or their owners. Nonetheless, this was an improvement since arms registration had been optional. This situation, combined with a historical lack of horizontal (state-to-state) and vertical (state-to-federal) police cooperation, made it impossible to track the movement of imported and domestically produced small arms.

It was not until 1997, with the Sistema Nacional de Armas (National Firearms System, or SINARM) Act, that a national arms control system was created and a legal requirement for comprehensive registration of privately owned guns was introduced. From then on, an individual who wished to purchase a small arm first had to obtain a registration permit from SINARM, which was administered by the federal police. Local authorities (usually the civilian investigative police) received the request and filed it with SINARM in Brasília, where criminal records were checked before the federal police authorized local authorities to grant the registration permit and register the arm. This permit only authorized the person to keep the arm at home, however; it was not a licence to carry it. Authorization to carry small arms was granted under separate procedures: by state authorities for carrying within state borders or by the federal police for carrying throughout the national territory.

Under the law, SINARM was required to centralize and maintain a national database of all registered and seized firearms in the country. Each state was required to update this information periodically. The process of digitizing local registries and linking them to SINARM via a computerized interface was painfully slow, however. Most data on registered and seized firearms reveal underreporting (evident whenever the number of weapons registered at SINARM is lower than the number of weapons reported by states during field research for this study). SINARM was still incomplete in 2003, when the new Disarmament Statute—which federalized and centralized control—was adopted. This poor performance was due not only to technical deficiencies, such as the lack of trained personnel and equipment for the efficient digitization of data (a common case in poor states with scarce resources), but also to political rivalries between local and federal authorities and bureaucratic competition between state and federal police agencies. To compensate for the lack of centralized, reliable records, field research was carried out in 25 states (complemented by phone interviews) for this study.

As noted above, in 2003 the Brazilian Congress approved the Disarmament Statute, which was to improve the flow and centralization of information. The technical and administrative aspects of the new law entered fully into force on 1 July 2004 (Presidência da República, 2004a).⁵ The Statute places responsibility for registering firearms and granting permissions to carry them with the federal government, via the federal police department. It thereby revokes the prerogative of all states to approve and issue permits to possess and carry arms. It grants the federal police responsibility for controlling sales in the domestic market and centralizing in a single database (still called SINARM) all information on manufactured, sold, imported, exported, registered (by civilians and members of the civilian and federal police corps), and seized firearms, as well as on the firearms inventories of the civilian police corps in each state. The Army, through the Directorate of Controlled Products of the Brazilian Army (DFPC), audits the manufacture, import, export, and registration of firearms held by military officers, members of the military police corps of each state, hunters, sports shooters, and gun collectors. All this information, along with the inventories of small arms and light weapons of the three armed forces, the military police corps, and federal intelligence agencies, is stored in an Army database known as the Sistema de Gerenciamento Militar de Armas (Military Firearms Management System, or SIGMA).

The regulations in practice

Some of the main obstacles encountered when compiling data available from official sources were:

- underreporting of firearm statistics from state police departments to the federal police central database.
- a frequent lack of accurate, up-to-date, computerized statistics on registered and seized small arms at the state level.
- a lack of accurate record-keeping on registered and seized small arms in many Brazilian states.
- a lack of communication between federal and local authorities for data collection and analysis.
- confidentiality rules and difficult access to military statistics.

This study finds that states with very efficient arms control mechanisms and sophisticated databases, such as Rio Grande do Sul, often underreport their data, perhaps due to institutional rivalries. In São Paulo—the richest, most developed, and most populous state—the federal police sub-contracted the digitization of all data on small arms registration to a private firm. This is the only state where local records match SINARM data. The private firm ceased the digitization work after payments from the federal government were delayed, however, and local authorities interviewed estimate that about 200,000 guns may have been left out of the system.

Between 1997 and 2000, SINARM personnel opened local offices in every Brazilian state and installed software and computers at the local police arms control units. Data problems tended to be (and still are) more severe in states with lower levels of development and a lack of infrastructure, or with poor coordination between the main office in the state capital and local police stations in rural areas and mid-sized cities. In many states, firearms were registered via paper forms at local police stations; this data was then reported, erratically and with delays, to the metropolitan offices. Interviews conducted for this study reveal that this same dynamic was often replicated when state offices reported to the national office in Brasília. Moreover, the registration campaign established by the SINARM Act was extremely inefficient due to bad coordination between the federal and state authorities and the lack of a consistent media campaign.

Another problem involved the differences in the periods covered by state data collections. The information provided by states failed to cover the whole period from the year registration began up to 2004, although there were a few exceptions.⁶ Most states provided information starting in the early 1980s, when the Army oversaw mandatory registration, or starting in 1997, when the federal police provided infrastructure for the digitization of data and it became mandatory to send records on registered and seized small arms to SINARM. As a result, there is a data vacuum over periods that range from 20 to 50 years.

Interviews confirmed that data for the years prior to 1980 are still held in disorganized paper files, some of which have deteriorated with time. But while the paper records may have disintegrated, the weapons have not, and many small arms purchased in the 1950s, 1960s, and 1970s are still in working order. Eighty-five per cent of Taurus revolvers (the most common make of small arm among both registered and seized arms) collected between August

and December 2004 at Viva Rio's collection posts during the voluntary arms buyback campaign were manufactured before 1981.⁷ Some 90 per cent of these weapons were functional, and more than 60 per cent of the people who delivered them were over 50 years old, suggesting that most of the weapons had been purchased before 1980, and certainly before 1997.⁸

In Rio de Janeiro, more than 25 per cent of the small arms seized by the police between 1951 and 2003 had been previously registered. This suggests a diversion of legal guns to illicit markets via irregular sales or theft. It is important to maintain updated computerized databases so that such weapons can be traced.

Table 2.1 illustrates the extent of underreporting by the states to SINARM. It compares the number of small arms registered with SINARM by private legal entities and individuals to information provided to field researchers for this study by the arms control units of the state-level police force. It identifies the period covered by the information collected during field research as well as the year in which registration began in each state, according to the interviewed source. Cases of underreporting to SINARM are shaded; mismatches in other cases are the result of different time periods covered by the available data (generally 1995–2003). São Paulo is highlighted as it is the only state that provided information that matched SINARM data up to 2003. Information from SINARM corresponds to two periods: 2003, before the approval of the Disarmament Statute (when the states ceased registering small arms), and late 2006, three years after its approval.

Compounding the chronic lack of cooperation between states and the federal government is the historic lack of cooperation between the federal institutions that monitor arms and ammunition supply (manufacture, sales, imports, and exports) and demand (purchase, carrying, use, and registration). The Army (which does not have criminal police powers or duties) controls and collects information on production; sales by manufacturers to dealers and exporters; imports; exports and direct factory sales to arms collectors, sports shooters, and hunters; and sales of weapons held privately (as opposed to institutionally held firearms) by members of armed forces, police forces, state-level military police officers, and federal intelligence agencies. Meanwhile, the federal police (under the Ministry of Justice) centralizes through SINARM the information on arms registered by civilians (including members of the civilian state police corps and federal police corps) and private security companies, as well as information on seized weapons.

Table 2.1 **Underreporting of registered small arms data**

State	Small arms registered by SINARM (until 2003)	Small arms registered by state police*	Period covered by state police records	Year in which registration began (according to interviewed source)	Small arms registered by SINARM (until 2006)**
Acre	3,652	481	2000–04	n/a	32,508
Alagoas	13,822	1,299	2002–03	1969	35,440
Amapá	6,008	9,500	1980–2004	1968	8,612
Amazonas	36,322	34,813	1942–2003	1942	36,816
Bahia	56,037	61,414	1983–2003	1952	57,303
Ceará	22,668	53,278	1980–2004	n/a	57,913
Federal District	70,713	160,000	1962–2003	1962	160,565
Espírito Santo	20,975	39,541	1983–Jun. 2004	1965	21,790
Goiás	86,321	144,000	1996–2003	1967	243,122
Maranhão	21,958	n/a	n/a	1970	29,394
Mato Grosso do Sul	43,643	20,201	1997–2003	n/a	50,002
Mato Grosso	58,862	18,011	1997–2003	1975	67,747
Minas Gerais	96,908	99,327	1995–2003	1942	105,750
Pará	33,669	124,258	1943–2003	1943	38,539
Paraíba	105,285	n/a	n/a	1963	94,664
Paraná	229,470	300,000	1964–2003	1964	217,376
Pernambuco	124,748	172,947	1975–Apr. 2005	1975	191,940
Piauí	34,458	n/a	n/a	1987	29,711

Rio de Janeiro	160,646	550,669	1951–2001	1951	159,713
Rio Grande do Norte	51,852	34,860	29,000 until 1997 and 5,860 until 2003	1980	56,017
Rio Grande do Sul	164,133	501,901	1950/55–2003	Between 1950 and 1955	170,069
Rondônia	26,202	19,340	1997–Jul. 2003	n/a	25,703
Roraima	10,077	n/a	n/a	n/a	12,615
Santa Catarina	57,888	245,545	1972–2003	1972	212,545
São Paulo	1,593,902	1,593,902	1935–2003	1935	1,839,326
Sergipe	15,384	21,940	1983–2003	n/a	14,917
Tocantins	10,088	36,000	n/a	1989	19,935
Total	3,155,691	4,243,227***			3,990,032

* State police data was obtained during field research conducted for this study.

** Firearms include those belonging to civilians, members of civilian state police corps, members of federal police corps, private security, and other private legal entities.

*** This figure does not include all states.

Sources: SINARM (2003; 2006); interviews with small arms control offices of the state civilian police corps

Until 1997 there was no communication between these agencies. The 1997 SINARM Act decreed that the Ministries of Justice and Defence would establish an inter-agency protocol for information exchange on small arms. That protocol was never created, however, and in practice there was no exchange of information. The SINARM Act required manufacturers and importers to send the federal police a list of the small arms sold or purchased with the identification of the purchaser; that information was not provided on a real-time basis but rather erratically sent on diskettes.⁹

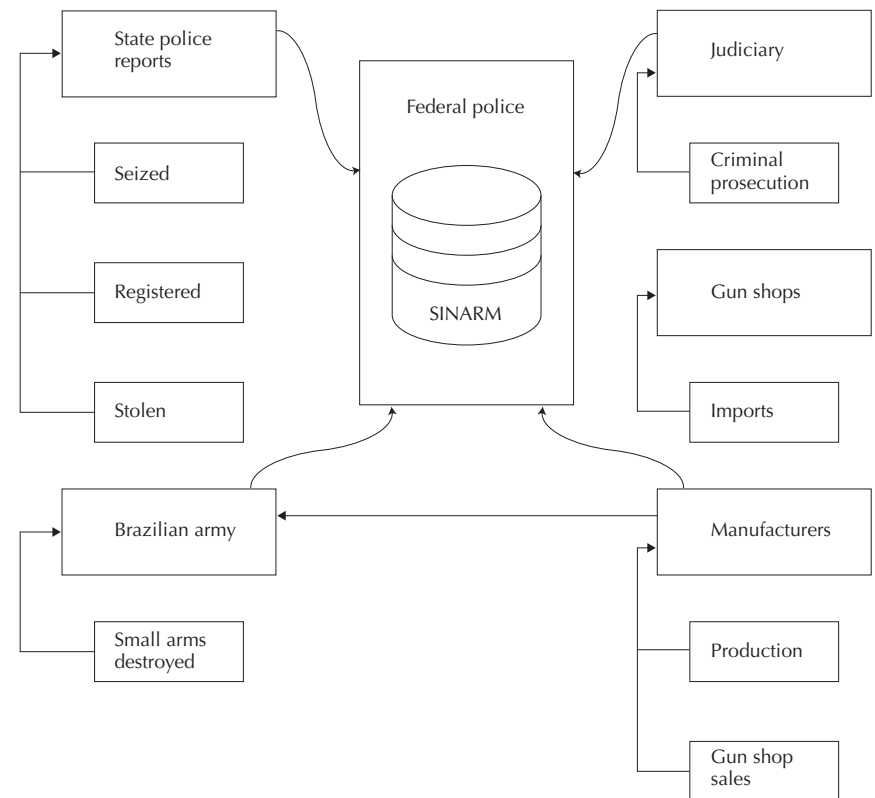
SINARM's software and structure were designed in 1997 (see Figure 2.1). The system can track the life cycle of guns from the moment they leave the factory or are imported until they are discharged or destroyed. It should be able to track property transfers and cross-reference information on manufactured, traded, registered, and seized guns, but the failure to consistently update the data has made effective tracking impossible.

The practical result of this lack of cooperation is that information on the trade routes of newly produced and imported firearms was never compared with available data on arms registration and confiscation. This made it virtually impossible to track patterns in the routes used for diverting arms and illicit trafficking, or to detect the irregularities in arms sales that enable 'grey markets' to be established. Police forces, particularly the federal police, were crippled in their efforts to fight the illicit trade in small arms. They were also unable to determine the volume, type, or serial numbers of arms and ammunition exported to countries that represent a potential risk for 'triangulation' (the illicit re-export and diversion of legally imported arms and ammunition), such as Paraguay and Suriname.

Underreporting from the Brazilian government to the federal police is also evident. For example, the SINARM database records the seizure of 7,844 small arms in 2004, 16,736 in 2005, and 21,934 in 2006 (Departamento da Polícia Federal, 2006c). Although these figures should reflect data reported by every state police institution, they only slightly exceed the number of weapons seized annually in the state of Rio de Janeiro alone (13,000 weapons per year) as recorded in Rio de Janeiro's civilian police database.

A further key research challenge was obtaining data from the DFPC. This agency is the gatekeeper for data on arms production, sales (including information about gun shops), exports, imports, registers of private holdings of re-

Figure 2.1 'Ideal SINARM' (1997)



stricted-use small arms (usually held by military and law enforcement officers and non-commissioned officers, or NCOs), as well as information on armed forces and state military police inventories and stockpiles. After a long process of confidence-building, and under a confidentiality protocol, the Army granted Viva Rio access to its statistical yearbook (*Anuário Estatístico do Exército*, or AnEEEx), which contains statistics on permitted-use small arms production and sales as well as on the number of registered collectors, sports shooters, and hunters (*coleccionadores, atiradores, and caçadores*, or CAC) and their weapons. Information on sales and production of permitted-use small arms and ammunition dates from 1967 to 2003, while information on restricted-use small arms

sales (to law enforcement agencies) is only available from 2000. Data on CAC and gun shops is available from 1997. It was not possible to obtain data on the armed forces' stockpiles and holdings or the private holdings of military officers and NCOs. This data is registered with SIGMA and, as in most Latin American countries, is considered highly confidential. In these cases, this study relies on multipliers based on secondary sources and interviews.

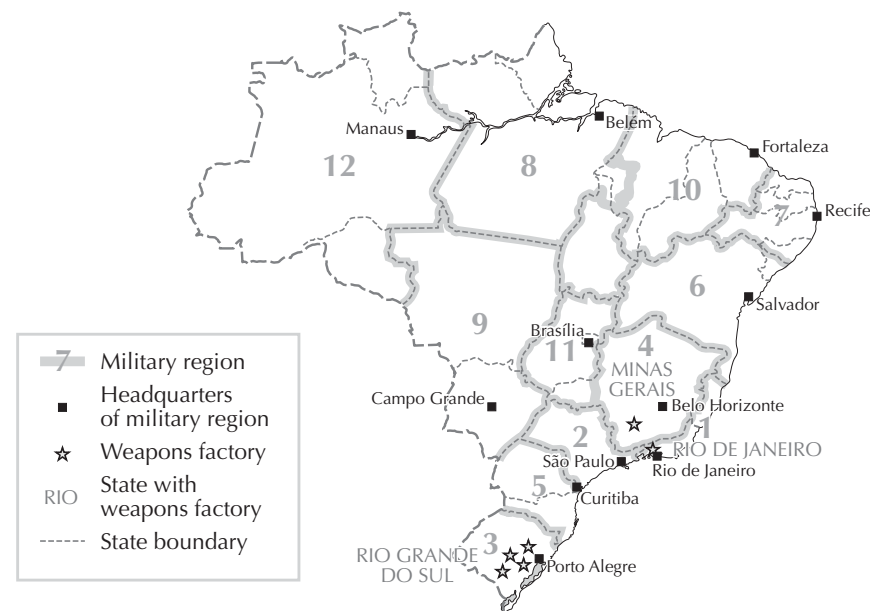
One minor obstacle encountered when using AnEEEx is that the data is not organized by state but by military region (MR), the major unit of the Brazilian Army's order of battle, equivalent to army divisions. Fortunately, many MRs correspond to just one or two states, particularly in the case of states that are important in terms of income, population, or small arms-related problems: São Paulo (2nd MR), Minas Gerais (4th MR), Rio Grande do Sul (3rd MR), Rio de Janeiro and Espírito Santo (1st MR), Santa Catarina and Paraná (5th MR), and Mato Grosso and Mato Grosso do Sul (9th MR).

In order to match the data to states, the AnEEEx data related to CAC holdings was distributed in proportion to the number of small arms legally registered by civilian individuals in each state. CAC members were distributed in proportion to the population of each state. Map 2.1 shows the Brazilian Army's military regions as well as the location of small arms and light weapons factories.

Small arms in Brazil: distribution and holders

Small arms holdings may be divided into two general categories. On one side are the firearms held by government bodies (including the armed forces and police), which, in principle, should not be part of the gun violence problem. On the other side are private holdings, small arms in the hands of law-abiding citizens or criminals. In reality, however, these two groups are not entirely distinct. In a country where small arms registration only became systematically regulated at the national level in 1997, it should be assumed that there is a huge informal market of small arms that, while not necessarily in the hands of criminals, are undeclared and unregistered, and thus illicit; these firearms are more susceptible to being diverted to criminal markets. Complicating matters are various 'gun castes', such as collectors (who are permitted to own military-style weapons and keep them at home), sports shooters, hunters, po-

Map 2.1 **Military regions of the Brazilian Army**



Source: ANEEEX various issues

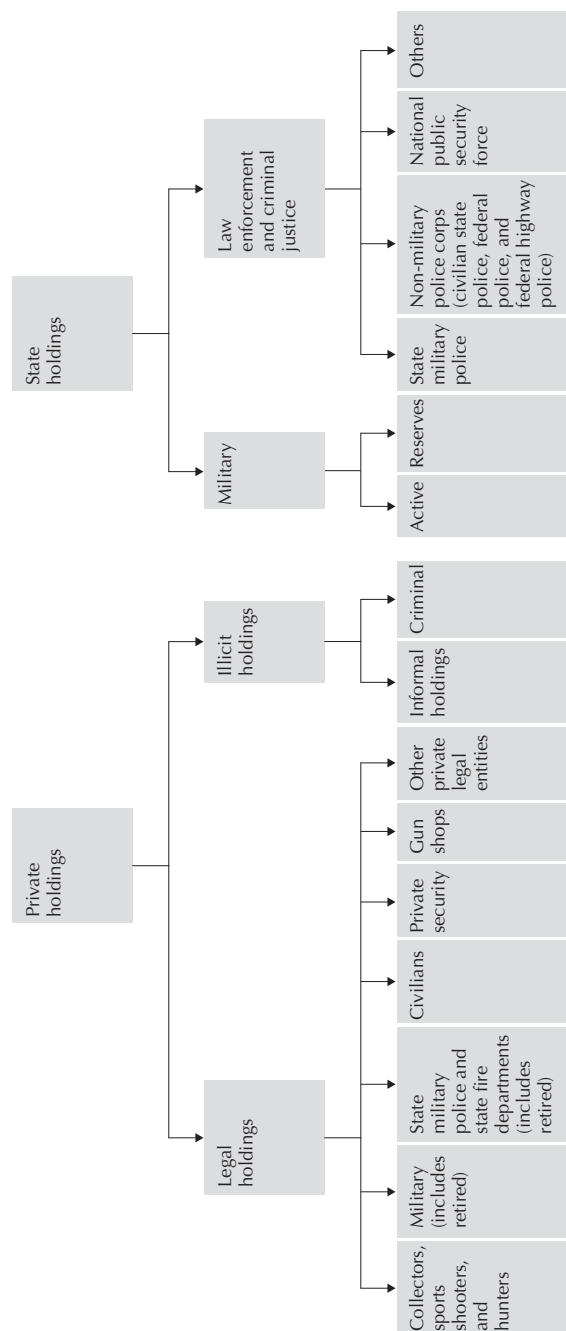
lice and military officers, and NCOs, who possess privileges to buy small arms and are not directly monitored by the police. In addition, there is a booming private security industry that employs twice as many guards as there are police officers in the country (Dreyfus and Nascimento, 2005, p. 145).

Figure 2.2 presents this report's universe of study. The state is represented by armed forces and law enforcement agencies' holdings and stockpiles. Private holdings are divided into two main groups: legal holdings and illicit holdings. This latter group is sub-divided into informal (undeclared) and criminal holdings.

Private (non-governmental) holdings

This section begins with private holdings, and more specifically with registered civilian holdings (individual and legal entities). This type of firearm ownership is supposed to be registered with SINARM. In order to calculate these holdings, the following information was cross-referenced:

Figure 2.2 Universe of study: holding groups



- SINARM data (totals for 1997–2006).
- the final report of the parliamentary commission on small arms-trafficking organizations, which met from April 2005 to November 2006 (Câmara dos Deputados, 2006).
- data (quantity and year) on registered small arms (by civilians and private legal entities) collected in the public security secretariats of each Brazilian state.

Thanks to Viva Rio’s cooperative relationship with the state government of Rio de Janeiro, the researchers were given full access to the database of the Division of Control of Firearms and Explosives of the civilian police of Rio de Janeiro, which contains information on serial number, make, calibre, and type of weapon. For other states a combination of quantitative and qualitative (interview) research techniques was used to obtain information on the rural–urban distribution of small arms registration and, in some cases, on the type and calibre of registered weapons. See Appendix 2 for translations of the questionnaires used in interviews. In a few cases, states provided data on the number of registrations per year; more frequently, though, they provided totals for a given period. Holdings were estimated for each of several types or groups of holders, and then distributed among the municipalities of the 27 units of the federation.

a) Legal holdings among civilians (individuals, including members of the civilian state police corps and federal police agencies) and legal entities (such as private security companies and firms with security departments)

Until 2003 all privately held small arms had to be registered with the civilian police of each state, which had to pass this information to SINARM (coordinated by the federal police). An exception was made for gun collectors, sports shooters, and hunters (CAC); members of the armed forces; military state police corps; military fire department corps; federal intelligence members; and the protection agencies of federal authorities. Since December 2003, all other individuals and private companies have had to register their weapons directly with SINARM. In November 2006 the head of SINARM provided Viva Rio with official statistics on the quantity of all small arms registered up to 7 November 2006 (Departamento da Polícia Federal, 2006b). According to

SINARM, the number of small arms registered by civilian private individuals for personal defence and survival hunting purposes is 3,688,506 (Departamento da Polícia Federal, 2006b).

b) Estimates of small arms held by active and retired military officers and non-commissioned officers for private use

Active duty: Officers and NCOs¹⁰—who make up 43 per cent of the total armed forces¹¹—may hold firearms for personal use. By law, each officer and NCO has the right to buy three small arms (one handgun, one rifled long-barrel gun, and one smoothbore long-barrel gun) every two years. Based on interviews, it seemed appropriate to use a conservative estimate of two handguns purchased per officer and NCO. Multiplying the total number of officers and NCOs in the three armed services by two yields a total of 289,800 small arms possessed by active-duty officers and NCOs in the armed forces.

Retired: According to a secondary source, Brazil is home to as many as 500,000 active and retired military officers and pensioners (widows and dependent children are included in this category) (Mariz, 2004). There are 350,900 active soldiers in the Brazilian military, which leaves a total of 149,100 retired military officers and pensioners. The number of retired military officers must be extracted from that figure.

The average age of retirement for military officers is 55. The average life expectancy for men in Brazil is 70, so the average retiree benefits from 15 years of his retirement pension.

On average, Brazilian wives are five years younger than their husbands, and life expectancy for women is 75 years. Therefore, the average military wife is 65 years old when her husband dies, and would benefit from a further ten years of his pension. Dependent children would benefit for a further 20 years (given a generational gap of 20 years).

A multiplier of 15/45 can therefore be applied to estimate the proportion of retired military officers and NCOs.¹² This rate corresponds to approximately 35 per cent of 149,100, which equals about 20 per cent of the active-duty personnel, a proportion confirmed in interviews conducted for this study. To find the number of firearms held by this group, this study applies a multiplier of two (two handguns per retired officer and NCO) to the resulting amount.

Following these criteria, an estimated total of 52,691 retired military officers and NCOs hold 105,382 small arms.

c) Registers of small arms: military state police corps and military fire department personnel (for private use)

Active duty: Interviews reveal that police officers usually own two handguns, one as a backup to their institutional firearm, and the other kept at home. For the purposes of this study, only the weapon kept at home is considered a privately held weapon, since the backup one is used on duty. A conservative multiplier of one weapon per police officer is therefore used, yielding 425,000 small arms.

Retired: Based on interviews with retired police officers, the total number of retired police officers in Brazil is estimated to be 25 per cent of the total active-duty personnel. A conservative estimate of two small arms per retired police officer is applied to calculate holdings of 212,600.

d) Collectors, sports shooters, and hunters

Under Brazilian law, CAC members register their weapons with SIGMA and are monitored by the DFPC. Sports shooters and hunters are entitled to possess large quantities of small arms and can hold restricted weapons. Collectors are allowed to hold old models of weapons that are restricted to the armed forces. AnEEEx provides data about the number of collectors, sports shooters, and hunters per military region.

The quantity of small arms and light weapons held by collectors was estimated using an AnEEEx table that compares the number of weapons held (divided into four ranges: 1–10; 11–49; 50–100; and more than 100) with the number of collectors who fall under each range. Data is provided by military region. The average quantity for each range was calculated and multiplied by the number of collectors per range. The result is 155,096 small arms.

Although sports shooters and hunters can buy small arms and renew their permits quite easily, the evidence from interviews and secondary sources suggests a conservative multiplier of four small arms per hunter and shooter.¹³

Using these criteria, holdings are estimated at 155,096 for collectors, 52,792

for sports shooters, and 4,692 for hunters. These estimates add up to a total of 212,600 weapons for the CAC.

e) Private security companies

According to SINARM, there are 238,462 small arms registered by private security companies, and 63,064 by other entities authorized to hold weapons, such as banks and the security branches of large corporations. Private security companies thus hold a total of 301,526 weapons (Departamento da Polícia Federal, 2006b).

f) Gun shops

According to SINARM, the number of weapons held by gun shops is 135,370 (Departamento da Polícia Federal, 2006b).

g) Informal and criminal holdings

Informal and criminal holdings are the most difficult to estimate. There are no official records of illicit small arms holdings; that is, unregistered weapons possessed by individuals or companies. Some of these weapons are used by criminals to carry out illegal activities. For the purposes of this report, unregistered firearms that are not in the hands of criminals are referred to as ‘informal holdings’; illicit firearms that are in the hands of criminals make up ‘criminal holdings’.

In the absence of official statistics, the following data was used to produce estimates:

- The main reference was the Rio de Janeiro civilian police database, which contains 550,669 records on registered small arms and 232,997 records on seized small arms (from 1951 to 2003). Data on registered and seized weapons was cross-referenced (by serial number, make, calibre, and manufacturer) to determine the proportion of registered weapons among seized weapons.
- Data on registered and seized small arms sent by other state security secretariats.
- The final report of the Congressional Hearing Commission on Small Arms Trafficking Activities in Brazil (Câmara dos Deputados, 2006).
- Research by Renato Sergio de Lima, Jaqueline Sinhoreto, and Luci Gati Pietrocolla, of the University of São Paulo, who estimated criminal firearm

holdings in São Paulo (de Lima, Sinhoreto, and Pietrocolla, 2001).

- A voluntary survey of 3,010 participants in a small arms buyback campaign at Viva Rio’s collection posts in Rio de Janeiro, and 350 participants who handed over guns at the collection points of the NGO Sou da Paz in São Paulo. In this study informants were asked whether their guns were registered. Because of the profile of the individuals interviewed (Dreyfus, Guedes, and Nascimento, 2008), the sample was considered to form part of the ‘informal + registered’ sector. Based on these interviews the proportion of registered weapons in this universe was estimated to be 0.537578288.

Using the above sources, the following steps were taken to estimate the quantity of small arms held—both informally and illegally—by civilians in the state of Rio de Janeiro.

- Known quantities were identified:
 - registered weapons from 1951 to 2003 (Reg),
 - seized weapons from 1951 to 2003 (Seiz), and
 - the percentage of Reg weapons among Seiz weapons: 25.7 per cent for the period 1951–2003.
- Assumptions were made:
 - Seiz was assumed to be a reasonable sample of all weapons in circulation (Circ), both registered and unregistered.
 - A bias was assumed to exist in the data because most Seiz (78 per cent) had been seized between the period 1981 and 2003, which corresponds to an increase in violence in Rio de Janeiro. The percentage of Reg over Seiz for this period (1981–2003) was therefore used: 25.6.
 - While it is known that the universe of small arms comprises registered weapons (Reg) and illicit weapons (Illi), the final report of the Congressional Hearing Commission also includes a significant proportion of Reg among Seiz for the states of São Paulo (17.3 per cent) and the Federal District (28.6 per cent). Sample sizes were taken into account for each sample (Rio de Janeiro, São Paulo, and Brasília) and the data was weighted, giving a Reg/Seiz figure of 24.5 per cent (0.245195805). This multiplier is close to the one identified for Rio de Janeiro: 0.256 or 25.6 per cent. The Rio de

Janeiro multiplier was thus used, given that access was available to the overall database of seized and registered firearms and not just a sample of a given historical period, as was the case for Brasília and São Paulo.

—Assuming that Seiz is a sample of all weapons in circulation and that

Reg represents 25.6 of Circ, the following equation was devised:

$$(\text{Reg}) = (\text{Circ}) * 0.256 \text{ or } (\text{Circ}) = (\text{Reg}) / 0.256$$

$$(\text{Circ}) = 3,688,506 / 0.256 = 14,408,226$$

Since

$$(\text{Circ}) = (\text{Reg}) + (\text{Illi})$$

Then

$$(\text{Illi}) = (\text{Circ}) - (\text{Reg}) = 14,408,226 - 3,688,506 = 10,719,720$$

Two figures were then subtracted from 10,719,720: the number of seized firearms

the Army reported it had destroyed (748,000) and those the federal police reported had been collected during the voluntary gun collection campaign

(471,873).¹⁴ The total estimate for illicit weapons holding was therefore 9,499,847.

Legal weapons in the hands of law-abiding citizens (RegLAC) were then obtained with the following calculation:

$$(\text{RegLAC}) = \text{Legal private holdings} - \text{Private security holdings} - \text{Gun shops holdings} - \text{Other private security holdings}$$

$$(\text{RegLAC}) = 5,370,500 - 238,500 - 135,400 - 63,100 = 4,933,500$$

CircLAC, the holdings of non-criminal citizens—those who hold registered or unregistered firearms that they do not use in delinquent activities—was calculated in the following way:

$$(\text{CircLAC}) = (\text{RegLAC}) + \text{Informal holdings}$$

The voluntary interview sample provided the following estimates:

$$(\text{RegLAC}) = 0.537578288 * (\text{CircLAC})$$

$$(\text{CircLAC}) = (\text{RegLAC}) / 0.537578288$$

$$(\text{CircLAC}) = 4,933,500 / 0.537578288 = 9,177,268$$

Consequently:

$$(\text{CircLAC}) = (\text{RegLAC}) + \text{Informal holdings}$$

$$\text{Informal holdings} = (\text{CircLAC}) - (\text{RegLAC})$$

$$\text{Informal holdings} = 9,177,268 - 4,933,500 = \mathbf{4,243,768}$$

Consequently:

$$\text{Criminal holdings} = \text{Illicit holdings} - \text{Informal holdings}$$

$$\text{Criminal holdings} = 9,499,847 - 4,243,768 = \mathbf{5,256,079}$$

State holdings

State holdings are by definition legal. In principle, institutional small arms should not form part of the violence problem in Brazil. Police and military small arms can, however, become part of the problem when diverted to organized crime or when police abuse their power.¹⁵ Thus, beyond the exercise of counting guns, it is useful to locate and identify military and police small arms arsenals, since they sometimes fail to meet adequate stockpile security standards.¹⁶ Moreover, police do not always have adequate training to recognize in which situations they should use their weapons.

With more than 350,900 active troops, Brazil has the largest armed forces in South America. Since the 1960s the country has developed a sophisticated private and state military complex that produces heavy conventional weapons and a wide range of small arms and light weapons, some of them designed domestically. These range from semi-automatic pistols and assault rifles to mortars and portable guided anti-tank missiles. With the exception of man-portable air defence systems, or MANPADS (which the country could easily develop), Brazil is self-sufficient in small arms and light weapons and their ammunition (Dreyfus, Lessing, and Purcena, 2005, ch. 1; Franko-Jones, 1992).

In the case of local law enforcement agencies in particular, rampant corruption, low salaries, and penetration by organized crime contribute to the diversion of small arms and ammunition, especially among lower-ranking personnel (corporals and soldiers).¹⁷ The situation is even worse in states such as Rio de Janeiro and Espírito Santo—both very violent states with a high presence of organized crime groups—where police corps regularly use assault rifles as standard weapons. Police officers are frequently murdered for their weapons in these states (Câmara dos Deputados, 2006, pp. 35, 335–450; Rivero, 2005, p. 251). There is a high concentration of military bases in the municipality of Rio de Janeiro, many of them located very close to *favelas* (slums) that are controlled by criminal factions. Most of the Air Force's logistical and materiel bases are in Rio de Janeiro, as are most of the small arms belonging to the Air Force infantry units that guard these bases. There were two episodes in 2004 involving the diversion of HK-33 rifles and hand grenades belonging to the Air Force. The Marines (an elite force) also have their main bases and facilities in

Rio de Janeiro and its suburban area, as does the Army Parachute Brigade, which is formed mainly of conscripts recruited in that municipality. Seizures and arrests involving theft from the Marines and the Army are common.

When interviewed, military sources expressed concern about conscripted soldiers who serve in military bases located close to crime-dominated *favelas* in the metropolitan area of Rio de Janeiro. These young conscripts may be involved in the theft of arms and ammunition or may be recruited at the end of their military service as *soldados do tráfico* (drug-trafficking soldiers). The same applies to professional soldiers who rise to the rank of corporal but fail to pass exams to be promoted to sergeant (Dreyfus, Lessing, and Purcena, 2005, ch. 1; Franko-Jones, 1992). Cases of diversion from military bases are also common in other states of Brazil.¹⁸ The head of the Army's Directorate of Controlled Products, the agency legally mandated to centralize all information on small arms stockpiles, submitted information on theft, robbery, and diversion involving conscripts to congressional commission hearings in 2005 and 2006 (Câmara dos Deputados, 2005, pp. 7, 23).

Armed forces: strength and holdings

Strength

The Brazilian armed forces comprise the Army, Navy, and Air Force (Senado Federal, 2004, art. 142, p. 87). Each branch has reserves, which are incorporated either by recall or by mobilization (Presidência da República, 1999, art. 8). Brazil's president is commander in chief of the armed forces and designates a minister of defence to whom the armed forces are directly subordinated. The president, with the advice of the minister of defence, names a commander to head each branch (Presidência de la República, 1999, chs. I–II). Brazil has a conscription system: between 2 January and 30 April every male citizen over 18 years of age must enlist in one of the three branches. Enlisted recruits are called up at 19 years of age to serve for one year. They may opt to join a particular force, subject to it having a presence in the municipality where they live and an unfilled recruitment quota. Since 1994 women have been able to serve as soldiers on a voluntary basis (CENM, 2004, p. 137). Conscripts may opt to continue their military career as professional voluntary sol-

diers, who can also be directly recruited. Some corps, such as the Navy Marines (*fuzileiros navais*), only employ professional soldiers (CENM, 2004).

Since 1974, as mandated by law, a presidential decree has been publicly issued each year to set troop levels for the Brazilian Army. As shown in Table 2.2, figures are disclosed by rank (generals; superior, intermediate, and subaltern officers; sergeants; and corporals and privates). In the case of the Navy and the Air Force, only the number of officers is disclosed in the presidential decree. The total strength of the three branches has been included in the Federal Budget Act (Lei do Orçamento da União) for 2000, however, which means information on the total manpower of the Air Force and Navy is available in the Federal Budget Act from 2000 to 2007. The number of Air Force and Navy NCOs and privates was estimated using the presidential decrees establishing numbers of officers, as well as secondary sources such as *Military Balance*, published by the International Institute of Strategic Studies (IISS), and *Balace Militar de América del Sur (Military Balance of South America)*, which is published periodically by the Argentine think tank Centro de Estudios para la Nueva Mayoría (CENM). The latest available data from local sources has been prioritized; vacuums in data on military personnel were filled using data from *Military Balance*.

Army: The Brazilian Army comprises seven military commands (Amazonia, North-east, West, Central or Planalto, East, South-east, and South), subdivided into 12 military regions (divisions), which are in turn subdivided into 25 brigades. At the tactical level, the brigades are divided into 71 infantry battalions (74 if 2 special operations battalions and the presidential guard cavalry squad are counted), 36 cavalry regiments and squadrons, 41 artillery groups (and 9 independent batteries), 5 Army air corps squadrons, 4 Army police corps battalions, 21 independent Army police platoons, 1 chemical warfare company, 1 electronic warfare company, 21 engineer battalions, and 13 independent engineer companies (CENM, 2004, p. 190).

The Navy: The Brazilian Navy is made up of a general command and eight naval districts (1—Rio de Janeiro, where the bulk of the fleet and the Marines are based; 2—Salvador; 3—Natal; 4—Belem; 5—Rio Grande; 6—Ladario; 7—Brasília; and 8—São Paulo).

Table 2.2 **Estimated strength of the Brazilian armed forces**

Rank	Army	Air Force	Navy	Reserves (Army, Navy, Air Force)	Total
Generals	100		100	n/a	300
Superior, intermediate, and subaltern officers	26,000	7,400	7,800	n/a	41,200
Sergeants	52,400	28,400	28,800	n/a	109,600
Corporals and privates	143,300	31,000	25,500	n/a	199,800
Total	221,800	66,900	62,200	825,000	350,900

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Sources:

Army: Presidência da República (2008a)

Navy: officer corps: Presidência da República (2008d); total strength: Presidência da República (2007a; 2007c); NCOs and privates: CENM (2004)

Air Force: officer corps: Presidência da República (2008b); NCOs and privates: Presidência da República (2006a); total strength: Presidência da República (2007a)

Table 2.3 **Current strength of the Brazilian Navy**

Rank	Marines	Fleet, support services, and air corps	Total
Admirals	9	70	80
Superior, intermediate, and subaltern officers	800	7,000	7,800
Sergeants	3,400	25,400	28,800
Corporals, privates, and sailors	10,300	15,200	25,500
Total	14,500	47,700	62,200

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Sources: officer corps: Presidência da República (2008a); total Marines strength: IISS (2008); total Navy strength: Presidência da República (2007c); NCOs and privates: estimated based on CENM (2004) and the proportion of NCOs in the Army

Besides surface and air units (submarines are based in Rio de Janeiro), each naval district hosts a Marines battalion, with the exception of São Paulo. The bulk of the Fleet Marine Force (Força de Fuzileiros da Esquadra, FFE) is concentrated in São João de Meriti, in the north of the city of Rio de Janeiro, and has an amphibious division made up of three infantry battalions, one artillery battalion, one command and control battalion, one armoured battalion, and an air defence battalion; a special operations battalion; and a Navy police corps com-

pany. The amphibious division is supported by four logistical support battalions. All naval districts have a subordinated Marine battalion, except for the eighth naval district, which has none, and the fourth naval district, Amazon, which has two, in Belém and Manaus. There are 11 Marine infantry battalions in total, the eight independent battalions and the three FFE battalions (CENM, 2004, pp. 213–14). Table 2.3 shows the strength of the Navy by rank.

Air Force: The Brazilian Air Force has a general command and five air zones. These are divided into ten air groups, which are subdivided into 19 air squadrons (the basic tactical unit of this service). The Air Force also has 18 infantry battalions, which protect its air bases and strategic facilities; seven special infantry battalions, which have a special operations platoon and can carry offensive combat activities; one special operations and rescue squadron; and eight independent infantry companies. The special infantry battalion located at the Canoas Air Base in Rio Grande do Sul has an anti-aircraft company armed with Iгла MANPADS (CENM, 2004, p. 289; Força Aérea Brasileira, 2004; 2007; 2008a; 2008b; Valdenice, 2008a; 2008b).

Reserves: *Military Balance* estimates that there are 400,000 members in the reserves of the three armed forces in Brazil, all of whom are subject to immediate recall (IISS, 2006, p. 173). This figure is realistic for the first line of armed forces reserves (the one likely to be armed and mobilized).¹⁹ The state military police and fire brigades are also part of the Army reserve, however, adding an extra 425,000 men and women.²⁰ The Army may arm this group with automatic individual and collective small arms and light weapons to maintain public security in threatening situations or to defend their bases and facilities (Presidência da República, 1969, arts. 3, 14; 1988, art. 144; IISS, 2008, p. 71). In total, therefore, 825,000 personnel are subject to immediate recall.

Holdings

In estimating military stockpiles, it is not possible to assume that every soldier is allocated one firearm or to apply the same multiplier across the three branches of the armed forces. In the Army, for example, assault rifles are the main weapon used by infantry units, but their use is more limited in artillery and armoured units and in the Army's communications, engineering, logistics, and specialized support services. Similarly, the infantry units of the Navy

and the Air Force have more firearms equipment than the rest of the units. This section explains how differences and specificities of each branch were considered in estimating the holdings in Table 2.4.

The Brazilian government was unable or unwilling to provide this project with national statistics on overall military and police small arms and light weapons inventories, so that estimated totals had to be used. Existing Brazilian research—such as official statistics on military personnel levels, field manuals, statements from official spokespeople, and interviews with serving and retired officers—provides important clues. Military field manuals are especially revealing regarding operational requirements and planning assumptions for small arms distribution, and interviews provide details about actual arming practices. In combination, these sources allowed for a substantial improvement on estimates that rely entirely on global assumptions. These estimates are still approximations, however, and are inferior to official statistics on military and police small arms inventories. Where doubt is most serious, such as for the armaments of reserve forces, ranges are presented instead of a single figure. All such estimates are used here as an expedient, in the hopes that official data will become available in the near future.

Three main sources were used:

- Army, Navy, and Air Force field operations and doctrine manuals, which establish the kinds of weapon that must be used by each member of each unit and sub-unit of each branch. For the Army, Marines, and Air Force infantry, the number of weapons has been estimated at the level of tactical combat units: infantry battalions, artillery regiments, and artillery groups.
- Official armed forces publications such as press reports, magazines, and periodical bulletins.
- Interviews with active-duty and retired military officers, NCOs, and privates.

The Army

I. Infantry

As with other South American armies, the organization of the Brazilian Army follows the classic ternary structure: three combat groups (of two squads each) form a platoon, three platoons form a company, three companies form a battalion, and three battalions form a brigade. The number of each kind of

Table 2.4 **Estimated current armed forces' small arms and light weapons requirements**

	Army	Air Force	Navy	Reserves	Total
Small arms (individual and collective)	299,300	42,100	60,800	914,100	1,316,300
Small arms					
Pistols	52,100	19,600	20,600	86,100	178,400
Revolvers	500	300	n/a	n/a	800
Sub-machine guns	9,100	200	2,400	n/a	11,700
Bolt-action rifles	89,000	6,500	11,000	822,700	929,200
Automatic rifles	143,300	15,500	25,200		184,000
Medium machine guns	5,300	n/a	1,600	5,300	12,200
Light weapons					
Heavy machine guns	1,800	n/a	300	n/a	2,100
MANPADS	100	100	100	n/a	300
Under-the-barrel grenade launcher	4,000	n/a	n/a	n/a	4,000
81 mm mortars	800	n/a	100	n/a	900
60 mm mortars	400	n/a	n/a	n/a	400
AT recoilless rifle	400	n/a	n/a	n/a	400
AT missiles	1,200	n/a	100	n/a	1,300
AT-4	4,000	n/a	n/a	n/a	4,000

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

weapon held by an infantry battalion was calculated from the bottom up; the quantity of the holdings of one battalion was then multiplied by the number of battalions in the entire Army.

According to Army doctrine field manuals, an infantry battalion consists of a command and support company (CSC), three infantry companies (ICs), and an administrative base. All kinds of infantry platoons (mechanized infantry, airborne infantry, light infantry, jungle infantry, armoured infantry, hunter battalions—*caçadores*, and frontier battalions) share the same basic structure, organization, and weaponry, though there are subtle differences in the structure of the support platoon (Exército Brasileiro, 2003a, pp. 1–3, A-1–A-12).

Table 2.5 Firearms held by CSC combat factions

Firearm	Number held by CSC combat factions
FAL rifles	37
81 mm mortars	4
Pistols	31
Igla MANPADS	3
Portable anti-tank missiles	16

Source: Exército Brasileiro (1997b, pp. 2-1-8-3)

Table 2.6 Firearms held by IC sections

Firearms	Firearms per command section	Firearms per infantry platoon	Firearms per support platoon
FAL rifles	4	24	14
Pistols	3	3	5
AT-4 rocket	0	6	0
FAP (light machine guns)	0	6	0
Under-the-barrel grenade launchers	0	6	0
Light machine guns (MAG)	0	1	0
60 mm mortars	0	0	2
AT recoilless rifles (Carl Gustav)	0	0	2

Source: Exército Brasileiro (1997b, pp. 2-1-8-3)

The CSC consists of seven platoons: command, communications, medical, supplies, logistics, mortars, and anti-tank. In airborne, light, and jungle infantry battalions, the command platoon has an anti-aircraft defence group equipped with MANPADS (Igla missiles) (Exército Brasileiro, 2003a, p. 1-3, A-1-A-12). Table 2.5 shows the number of weapons held by the combat factions of each CSC.

The ICs are divided into one command section, three infantry platoons, and a support platoon: Table 2.6 lists their holdings.

Multiplying these holdings by the number of platoons and then companies yields the typical holdings of combat sub-units of a Brazilian infantry battalion, as shown in Table 2.7.

Table 2.7

Firearms holdings of combat units of a Brazilian infantry battalion

Firearm	Number held
Pistols	31
Automatic rifles	37
MANPADS	3
Medium mortars	4
AT missiles	16
Pistols	51
Automatic rifles	270
Medium machine guns	63
Under-the-barrel grenade launcher	54
60 mm mortars	6
AT recoilless rifle	6
AT-4	54

Note: Only light infantry, jungle, airborne, and special operations battalions are equipped with MANPADS.

Sources: Exército Brasileiro (1997b, pp. 2-1-8-3; 2003a, pp.1-3, A-1-A-12)

It is worth noting that only light infantry, jungle, and airborne battalions are equipped with MANPADS; for this study, special operation battalions are also thought to be equipped with MANPADS. The Army's two special operations battalions hold one sub-machine gun, one assault rifle, and one pistol per soldier regardless of rank and function since it is a common practice in all countries that the personnel of special operation units use different kinds of small arms depending on their specific mission. There are 74 infantry battalions in the Brazilian Army, 26 of which are probably equipped with MANPADS. Multiplying the figures in Table 2.7 by the quantity of battalions yields the total small arms and light weapons holdings for the infantry of the Brazilian Army (see Table 2.8).

II. Artillery

The basic tactical unit of the Brazilian Army is the field artillery group (AG), equivalent to an infantry battalion. AGs are composed of a command section, a command battery, and three field artillery batteries. According to Brazilian mil-

Table 2.8 **Firearms holdings of combat personnel in infantry units**

Firearms	Number held
Handguns (pistols)	7,300
Sub-machine guns	2,800
Automatic rifles	22,700
Medium machine guns	4,700
Heavy machine guns*	800
MANPADS	100
Under-the-barrel grenade launcher	4,000
81 mm mortars	300
60 mm mortars	400
AT recoilless rifle	400
AT missiles	1,200
AT-4	4,000

Note: *The heavy machine guns figure is based on the number of armoured transport troop vehicles in the armoured and mechanized infantry battalions; there are 583 M-113 and 219 Urutu armoured vehicles, each armed with a .50 machine gun.

Figures have been rounded. Figures are from primary or secondary sources.

Sources: Exército Brasileiro (1997b, pp. 2-1-8-3; 2003a, pp. 1-3, A-1-A-12); IISS (2008)

itary doctrine, AGs are conceived—and equipped—as self-sufficient tactical and logistical units, even though they might be integrated into larger brigades or divisions; they act in conjunction with infantry and cavalry units (Exército Brasileiro, 1997c, p. C-1; 1998, p. C-20). Rather than rely on the support of infantry units, AGs are equipped with small arms and light weapons for defence against direct close attacks by enemy units. According to interviews with an artillery reserve officer, all privates and corporals in artillery units are armed with FAL rifles. Sergeants (commanding the crews of artillery pieces) are armed with one FAL rifle and one pistol. Officers (commanding batteries and AGs) are armed with one pistol and one sub-machine gun. The driver of the tow truck or self-propelled artillery piece is armed with a sub-machine gun.²¹

In order to arrive at a total number of small arms held by the artillery, these figures for types and numbers of weapons held per officer were multiplied by the number of artillery pieces of different sizes in the Brazilian Army. Infor-

Table 2.9 **Small arms held by individual artillery crews, by type of artillery piece**

Artillery piece (number of each kind)	Size of crew (per piece) ²²	Small arms held (per piece)
L-118 light guns (36)	9	1 pistol, 2 sub-machine guns, 7 FAL rifles
Model 56 howitzers (8)	13	1 pistol, 2 sub-machine guns, 11 FAL rifles
M-109 self-propelled guns (37)	7	1 pistol, 2 sub-machine guns, 5 FAL rifles
M-108 self-propelled guns (72)	6	1 pistol, 2 sub-machine guns, 4 FAL rifles
M-114 guns (92)	13	1 pistol, 2 sub-machine guns, 11 FAL rifles
Astros II self-propelled multiple rocket launchers (20)	5	1 pistol, 2 sub-machine guns, 3 FAL rifles
M-101 guns (312)	11	1 pistol, 2 sub-machine guns, 9 FAL rifles
GDF-001 (134) and L/70 anti-aircraft guns (12)	5	1 pistol, 2 sub-machine guns, 4 FAL rifles
120 mm heavy mortars (138)	7	1 pistol, 2 sub-machine guns, 5 FAL rifles

Table 2.10 **Small arms holdings for combat personnel of artillery units**

Firearm	Number held by artillery units
Pistols	900
Sub-machine guns	1,700
Automatic rifles	6,000
Medium machine guns	100

Note: Figures have been rounded. The figure in bold is from primary or secondary sources; other figures are estimates. Brazilian Army doctrine field artillery manuals state that each command and control battery of each artillery group shall be protected by three medium machine guns. There are 41 artillery groups, yielding a total of 123 medium machine guns.

Sources: interviews; IISS (2008, p. 68); CENM (2004, p. 190, for medium machine guns); Exército Brasileiro (1995, for medium machine guns; 1999b, p. E-1; 2003b, pp. 3-2, 3-4; n.d.); Vaz Carneiro (n.d.).

mation on the number of artillery pieces and size of their crews comes from *Military Balance* and various technical publications of the Brazilian armed forces (IISS, 2008, p. 68; Exército Brasileiro, 1999b, p. E-1; 2003b, pp. 3-2, 3-4; n.d.; Vaz Carneiro, n.d.).

Multiplying the number of artillery pieces in Table 2.9 by each type of small arm yields the total number of small arms holdings used by combating personnel in artillery units (see Table 2.10).

III. Cavalry (armoured)

The mechanized and armoured regiments are the tactical combat units of the cavalry. There are 14 mechanized regiments, 10 independent squadrons, and 9 armoured regiments in Brazil (CENM, 2004, p. 191; Exército Brasileiro, n.d.). Each regiment is subdivided into a command and support squadron and three cavalry squadrons, which in turn are subdivided into three cavalry platoons (Exército Brasileiro, 1999a). The total numbers of sections and platoons in the mechanized regiments and squadrons of the Brazilian Army add up to 85 sub-units (Exército Brasileiro, 2002a, pp. 1-4-1-8).

Each mechanized cavalry regiment has an 81 mm mortar section equipped with three pieces, as well as one 81 mm mortar per platoon. The number of small arms carried by the crews of each mortar piece and the command of the section was calculated by applying the criteria established in the field infantry manuals for these kinds of weapons. Each mechanized cavalry platoon is armed with one 81 mm mortar as well as two FAL rifles and three pistols, and each medium mortar section with three 81 mm mortars, seven FAL rifles, and nine pistols (Exército Brasileiro, 1997b, pp. 2-1-8-3).

The small arms and light weapons of the combatant members of cavalry units were calculated on the basis of the light weapons in each vehicle and the small arms carried by its crew. Soldiers, NCOs, and intermediate officers who man tanks and armoured vehicles use sub-machine guns rather than rifles. On the basis of information provided by interviewees, one side arm pistol was attributed to each crew member.²³ Light weapons were calculated according to the number of detachable machine guns carried by each vehicle, as described in the official technical army publications. Small arms were estimated on the basis of the number of soldiers serving in the crew of each type of vehicle, as outlined in interviews with military personnel. Data for the number of vehicles is available in *Military Balance* while data on the crew of each vehicle comes from technical army publications (IISS, 2008, p. 69; Exército Brasileiro, 2000, pp. 2-4-2-5; 2002a, pp. 2-8-2-9; n.d.). Figures and estimates are displayed in Table 2.11.

Multiplying the number of armoured vehicles in Table 2.11 by each type of small arm yields total small arms holdings in the cavalry used by combatants (see Table 2.12).

Table 2.11 Small arms held by cavalry crews

Armed cavalry vehicles (number in the Brazilian Army)	Light weapon carried per vehicle	Crew members	Small arms held per vehicle
Leopard main battle tanks (133)	7.62 x 51 mm MAG machine gun	4	4 pistols, 4 sub-machine guns
M-60 main battle tanks (91)	.50 heavy machine gun	4	4 pistols, 4 sub-machine guns
M-41 light tanks (112)	.50 heavy machine gun	4	4 pistols, 4 sub-machine guns
EE-9 Cascavel armoured reconnaissance vehicles (409)	MAG light machine gun	3	3 pistols, 3 sub-machine guns
EE-11 Urutú armoured personnel carriers (219)	.50 heavy machine gun	2	2 pistols, 2 sub-machine guns
M-113 armoured personnel carriers (583)	.50 heavy machine gun	2	2 pistols, 2 sub-machine guns

Table 2.12 Small arms and light weapons holdings of cavalry unit combat personnel

Type of small arm or light weapon	Total number held
Pistols	4,200
Sub-machine guns	4,200
Automatic rifles	1,100
Medium machine guns	500
Heavy machine guns	1,000
Other light weapons	
81 mm mortars	500

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Sources: interviews; IISS (2008, p. 69); Exército Brasileiro (1997b, pp. 2-1-8-3; 1999a; 2000, pp. 2-4-2-5; 2002a, pp. 1-4-1-8, 2-8-2-9; n.d.); CENM (2004, p. 191)

Table 2.13 Total estimates for army police corps

Firearms	Total number held
Pistols	500
Revolvers	500
Sub-machine guns	400
Automatic rifles	1,800

Note: Figures have been rounded.

IV. Army police corps

The Brazilian Army has special infantry units to fulfil internal police and law and order functions. The army police corps (Polícia do Exército) has sub-units specialized in escorting and protecting authorities (Companhias de Escolta). The members of sub-units are armed with .38 revolvers.

The army police corps is organized into four battalions, 21 independent platoons, and one independent company (Exército Brasileiro, n.d.). Each battalion is formed of two army police companies, an escort and protection company, and a command and services company (Polícia do Exército, n.d.a; n.d.b). Direct observation and informal conversations with former soldiers suggest there are two battalions in Rio de Janeiro: the battalion of the military police company and that of the guards, whose members use .38 revolvers as side weapons, independently of rank. The number of small arms held by the army police was calculated on the basis of the number of assault rifles (90) and pistols (26) used by normal infantry companies. In the case of escort and protection companies, one .38 revolver was added per member. That number was multiplied by the number of army police companies (20 when all platoons are grouped together) to obtain the total number of assault rifles, pistols, and revolvers (see Table 2.13). The army police is also equipped with sub-machine guns for specific police functions, such as motorized patrolling. The multiplier used for this kind of firearm is the same as that used for normal police forces in the case of long-barrelled small arms (0.33). The number of sub-machine guns was calculated by multiplying the typical size of an infantry platoon (32) by 0.33 and then by 36, the number of army police platoons (Exército Brasileiro, 2007c). Light weapons such as machine guns, anti-tank weapons, mortars, and MANPADS were not estimated for these units given their very specific police functions.

V. The rest of the Army

The holdings for the remaining Army units and sub-units, such as communications, health services, logistics engineers, and Army General Staff, were calculated on the basis of interviews with senior and intermediate officers. Personnel from these units use weapons for guarding military bases and facilities, for training, and for self-defence in wartime. Assault rifles are only used by infan-

try soldiers, infantry NCOs, and infantry officers up to the rank of captain. Interviewees indicated that an accurate multiplier would be one assault rifle per private and corporal. The number of assault rifles for the rest of the Army was calculated by subtracting infantry, artillery, cavalry, and army police rifles from the total number of privates and corporals in the Army as a whole. The Army has kept old Mauser rifles (converted to 7.62 x 51 mm at IMBEL) for military parades and for heavy training of conscripts. Interviewees said the multiplier for bolt-action rifles should be one rifle per conscripted soldier.²⁴

Interviews reveal that every two serving officers and NCOs share one pistol between them during guard shifts (a multiplier of 0.5). In addition, using a multiplier of 0.5 for pistols assigned to specific tasks in infantry, artillery, cavalry, and army police units, this study also applies the multiplier to the total number of officers and sergeants, to cover pistols stored at the facilities and bases for guard duty and protection.²⁵ According to interviewees, the multiplier used for bolt-action rifles should be one rifle per conscripted soldier. Other bolt-action weapons appear to be kept for reserve units. The holdings for the rest of the Army are shown in Table 2.14; Table 2.15 displays the figures for partial and total estimated holdings.

The Navy

I. The Marines

Holdings of the Marines were calculated using the same criteria as those used for the Army. The estimates were based on officially published materials that allow for the development of multipliers for the infantry, armoured, artillery, and police components of this corps.

Infantry battalions

Assault rifles: A typical Marine combat group (the smaller sub-unit of an infantry battalion) is armed with ten assault rifles (Teixeira de Alves, Correa Guimarães, and de Oliveira, 1988, p. 30). Three such groups form a platoon (30 rifles); three platoons form a company (90 rifles); and three companies form a battalion (270 rifles). The 12 infantry battalions (including a special operations battalion) of the Marines therefore require 3,240 assault rifles. In addition, each infantry battalion has a police platoon (30 rifles) and three special operations platoons (60 rifles per platoon). Multiplying these figures by 11 (the number of battalions

Table 2.14 **Holdings of the rest of the Army**

Firearms	Total number held
Pistols	39,200
Bolt-action rifles	89,000
Automatic rifles	111,700

Note: Figures have been rounded.

Table 2.15 **Partial and total estimated holdings of the Brazilian Army**

Firearms	Infantry	Cavalry	Artillery	Police Army Corps	Other units and activities	Total
Small arms						
Pistols	7,300	4,200	900	500	39,200	52,100
Revolver	0	0	0	500	0	500
Sub-machine guns	2,800	4,200	1,700	400	0	9,100
Bolt-action rifles	0	0	0	0	89,000	89,000
Automatic rifles	22,700	1,100	6,000	1,800	111,700	143,300
Medium machine guns	4,700	500	100	0	0	5,300
Light weapons						
Heavy machine guns	800	1,000	0	0	0	1,800
MANPADS	100	0	0	0	0	100
Under-the-barrel grenade launcher	4,000	0	0	0	0	4,000
81 mm mortars	300	500	0	0	0	800
60 mm mortars	400	0	0	0	0	400
AT recoilless rifle	400	0	0	0	0	400
AT missiles	1,200	0	0	0	0	1,200
AT-4	4,000	0	0	0	0	4,000

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

minus the special operations battalion, which has a special configuration) yields 5,550 rifles. The independent FFE police company holds 90 rifles, which brings the requirements of the infantry battalions to 5,640 rifles.

Sub-machine guns: The special operations battalion is made up of three companies, each of which is made up of three platoons of 45 members (Fontoura,

2008), each of whom holds one sub-machine gun, yielding a total of 405 sub-machine guns. Added to these are the 1,485 sub-machine guns held by the special operations platoons (33 platoons of 45 members, each armed with a sub-machine gun) of the remaining infantry battalions. Finally, there are the sub-machine guns of the police platoons and companies. There are 14 police platoons (one for each of the traditional infantry battalions and three for the FFE independent police company), each with 45 members. Applying the same multiplier that was used for the Army police corps (0.33) yields a total of 208 sub-machine guns. The total estimated number of sub-machine guns in infantry units is therefore approximately 2,100 weapons.

Artillery units

Small arms and light weapons holdings were estimated by applying the same method as that used for the Army; that is, by multiplying the number of small arms carried by the members of the crew of each artillery piece (see Table 2.16). Information on the number and type of artillery pieces comes from interviews and technical and specialized publications (IISS, 2008, p. 70; Vaz Carneiro, n.d.).

Armoured battalion and armoured personnel carrier battalion

The number of small arms used by the crews of the vehicles was estimated using the method applied to the Army (see Table 2.17). Information on the number and types of vehicles and their light weaponry comes from technical and specialized publications (IISS, 2008, p. 70; de Almeida and Ramos Lage, 2002).

Assault rifles held by the rest of the Marines

The holdings for the remaining units and sub-units of the Marines—such as communications, health services, engineers, air defence, logistics, and general staff—were calculated on the basis of information from interviews with superior and intermediate officers.²⁶ The weapons in question are used by the personnel of these units for guarding military bases and facilities, training, and self-defence during wartime. Interviewees indicated that an accurate multiplier would be one assault rifle per private and corporal. The number of assault rifles for the rest of the Marines was calculated by subtracting infantry, artillery and armoured, and transport vehicles units' rifles (5,640) from the total number of privates and corporals in the organization (10,270), yielding a total 4,630.

The number of pistols held by the Marines was calculated as follows: 1,890 pistols are held by the special operations units (battalion and independent

Table 2.16 **Small arms held by specific artillery units of the Marines**

Artillery piece	Crew*	Small arms per crew
L-118 light guns (18)	8	1 pistol, 2 sub-machine guns, 7 assault rifles
M-114 guns (8)	12	1 pistol, 1 sub-machine gun, 11 assault rifles
M-101 guns (15)	10	1 pistol, 1 sub-machine gun, 9 assault rifles
120 mm heavy mortars (8)	6	1 pistol, 1 sub-machine gun, 5 FAL rifles

Note: * Crews may also include a driver of the tow truck along with one more sub-machine gun; however, this study does not include this additional member or weapon as the information was not confirmed in the interviews with Navy staff.

Table 2.17 **Small arms holdings per armoured Marines vehicle**

Vehicle	Members in crew	Small arms (per vehicle)
EE-9 Cascavel armoured reconnaissance vehicles (6)	3	3 sub-machine guns
EE-11 Urutú armoured personnel carriers (5) armed with a .50 heavy machine gun	2	2 sub-machine guns
M-113 armoured personnel carriers (40)	2	2 sub-machine guns
AAV-7A (13)	3	3 sub-machine guns
LVPTP-7 (12)	3	3 sub-machine guns

Table 2.18 **Light weapons held by the Marines**

Firearms	Number held by the FFE	Number held by each one of the eight remaining infantry battalions
81 mm mortars	18	6
MAC BILL anti-tank portable missiles	18	6
.50 heavy machine guns	18	6
MK-19 40 mm machine guns	18	6
Mistral MANPADS	8	4

platoons); the conservative estimate of 0.5 that was used for the Army was also applied to the rest of the Marines. That multiplier was used for all officers and NCOs, yielding 4,330 pistols.

Light machine guns, light weapons, and recent assault rifles acquisitions

The number of infantry support weapons (machine guns and light weapons in general) comes from official Navy documents or secondary sources and did not have to be estimated.

Light weapons: According to the Brazilian Navy, the FFE and the remaining infantry battalions are equipped with the light weapons listed in Table 2.18.

Machine guns held by the Marines: According to an official magazine of the Marines, a typical combat group is equipped with three FAP (*fuzil metralhador*) light machine guns (Teixeira de Alves, Correa Guimarães, and de Oliveira, 1988). Multiplying this number by the number of combat groups in the 12 infantry battalions yields 972 FAPs.

Since 2001, the Marines have purchased 600 MINIMI 5.56 x 45 mm machine guns to replace their MAG 7.62 x 51 mm machine guns (Beraldi, 2006). This study assumes that the Marines still hold the 600 or so MAG machine guns that were replaced, and for the purposes of this chapter these were counted as surplus weapons and included among the small arms held by the Brazilian reserves.

Recent assault rifles acquisitions: The Brazilian Navy replaced the Marines' FAL rifles with M16A2 5.56 x 45 mm rifles between 1997 and 2000. Between 1997 and 1999 Brazil received 7,411 assault rifles as foreign military sales from the United States (LAWG, 2005; Beraldi, 2006). This study assumes that those rifles are the M16A2 rifles for the Marines, since the total rifle requirement of the Marine combat forces (infantry plus artillery) was estimated at about 6,000 rifles. The 7,411 rifles would cover the infantry and artillery units' needs, as well as part of the needs of the rest of the units (such as engineering, health, communications, logistics, general staff).

The Marines' total rifle requirement was estimated at about 10,700 rifles. Subtracting the newly acquired 7,411 M16 rifles yields a surplus of some 3,250 FAL rifles. Of these, 500 were recently lent to the military police of Rio de Janeiro, leaving some 2,750 FAL rifles to be used by the Marines in heavy training activities and as stockpiles for the reserves.²⁷

II. The rest of the Navy

To calculate the holdings of the rest of the Navy, a multiplier of 0.5 rifles for corporals and privates or sailors was used (one assault rifle for every two individuals); holdings for NCOs and officers were calculated using the Army multiplier of 0.5 pistols for every two NCOs and officers. This reflects the fact that aside from the Marines, who are heavily armed, in the rest of the Navy a

reduced number of small arms is shared among personnel while on guard duty; otherwise the firearms are locked away to be used to defend the bases or ships in the event of an armed assault. As in the Army, one old Mauser rifle is assumed to be available per conscript for parading or heavy training.²⁸

Table 2.19 lists the partial and total small arms and light weapons of the Brazilian Navy using the above-mentioned sources and calculations.

The Air Force

I. Infantry

The Air Force's infantry units have fewer personnel than those of the Army and Marines. Each Air Force infantry battalion comprises some 120 soldiers. A typical Air Force infantry platoon has about 20 soldiers (Força Aérea Brasileira, 2004; 2008b; Ministério da Aeronáutica, 1990). The special infantry battalions have an additional special operations platoon, and the Canoas Air Base special infantry battalion in Rio Grande do Sul has an extra anti-aircraft company armed with Igla 9K38 MANPADS (CENM, 2004, p. 289; Força Aérea Brasileira, 2007; 2008b; Valdenice, 2008a).

Assault rifles: The number of assault rifles was calculated on the basis of 1 per soldier serving in 6 special infantry battalions of 140 soldiers each; 1 special infantry battalion of 180 soldiers (including the air defence company); 18 infantry battalions of 120 soldiers; and 8 independent companies of 40 soldiers each.

Pistols: It was estimated that each member of the special operations platoons of the Batalhão de Infantaria da Aeronáutica Especial (the Infantry Battalions of the Brazilian Air Force, or BINFAEs)—seven platoons of 20 soldiers each—held one pistol. For the rest of the Air Force infantry, this study applies the same pistol multiplier that was used for officers and NCOs in the Navy and the Army (0.5). The same multiplier is used for all ranks since Air Force infantry personnel must perform base security functions that require them to carry handguns during their duty shifts.

Sub-machine guns: The number of sub-machine guns was estimated on the basis of one sub-machine gun for each of the members of the seven BINFAE special operations platoons (seven platoons of about 20 soldiers each).

MANPADS: The number of MANPADS was calculated by subtracting the number of Igla MANPADS estimated for the Army in this chapter (78) from

Table 2.19 **Navy holdings**

Firearms	Marines	Rest of the force	Total
Small arms			
Pistols	4,300	16,300	20,600
Sub-machine guns	2,400	0	2,400
Bolt-action rifles	0	11,000	11,000
Automatic rifles	17,600	7,600	25,200
Medium machine guns	1,600	0	1,600
Light weapons			
Heavy machine guns	300	0	300
MANPADS	100	0	100
81 mm mortars	100	0	100
AT missiles	100	0	100

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

the total number of Igla launchers purchased by Brazil (112 launchers), which yields an estimated total of 34 Igla launchers for the BINFAEs based at Canoas, Rio Grande do Sul.

II. The rest of the Air Force

To arrive at holdings for the rest of the Air Force, this study uses a multiplier of 0.5 rifles for corporals and privates (one assault rifle for every two individuals) and the same multiplier that was used in the case of the Army for NCOs and officers for pistols (0.5; one for every two NCOs and officers). This was based on the fact that aside from the Air Force infantry, which is heavily armed, a reduced number of small arms is shared among Air Force personnel while on guard duty, or otherwise the firearms are locked away to be used to defend the bases or ships against armed assault.²⁹

Table 2.20 summarizes the Air Force holdings arrived at through the use of the above-mentioned estimates and sources.

The reserves

According to IISS, Brazil has a first line of reserves of 400,000 troops subject to immediate recall in case of war (IISS, 2008). Adding together the first line of reserves and the states' military police corps and fire brigades (425,000) yields 825,000 personnel subject to immediate recall. One interviewee suggested

Table 2.20 **Air Force holdings**

Firearms	Air Force infantry	Rest of the Air Force	Total
Small arms			
Pistols	1,800	17,800	19,600
Revolvers	0	300	300
Sub-machine guns	100	100	200
Bolt-action rifles	0	6,500	6,500
Automatic rifles	3,500	12,000	15,500
MANPADS	100	0	100

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Table 2.21 **Strength and holdings of the reserves**

Institution	Strength
Reserves	400,000
State-level military police and states' fire departments	425,000
Total	825,000
Holdings	Total small arms and light weapons
Pistols	86,100
Bolt-action rifles	823,000
Medium machine guns	5,300

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

that 'only the first line of reservists matters' for planning and that the current requirement is for at least one rifle per reservist.³⁰ If the 2,000 (1,500 plus 500) rifles lent by the Army and the Navy to the police force were subtracted from this total, 823,000 rifles (either automatic, semi-automatic, or bolt-action) would be needed for the reserves.

The proportion of active-duty officers and NCOs was used in order to calculate the number of reserve officers and NCOs, which add up to 172,000. Using a very conservative multiplier of 0.5 handguns (side arms) for that group yields a total of 86,100 additional small arms for reserve officers and NCOs. In addition to the handguns, it is estimated that the reserves hold the 5,300 Madsen 7.62 x 51 mm machine guns that the Army replaced with more modern varieties in the 1970s. Handguns held by state military police corps and fire

brigades are not included here, but they are included in the estimates of holdings of these institutions.

Table 2.21 reflects the total strength and holdings of the reserves.

The Brazilian Army administers federal shooting ranges called *tiros de guerra* (war shooting ranges), where reservists can practice. Each *tiro de guerra* has a vault with ammunition, Mauser rifles converted to 7.62 x 61 mm (the so-called Mosque-FAL or Mosquetão-FALs), and automatic FALs, though the quantities have not been revealed.³¹

Public security agencies (law enforcement) and criminal justice: strength and holdings

According to the 1988 Brazilian Constitution, public security must be guaranteed by the following bodies (Senado Federal, 2004, art. 144):

- the federal police;
- the federal highway police;
- the federal railway police;³²
- the state-level military police corps, civilian police corps, and military fire brigades (fire departments).

The complexity of the police and criminal justice system in Brazil matches the size and diversity of the country. Each of the country's 26 states plus the Federal District has its own military police, organized along military lines (with military ranks, uniforms, and, in some cases, small arms) as well as an investigative civilian police (plain-clothes detectives). Consequently, there are 54 separate state police forces. Each state decides autonomously what kinds of weapons its police will use and how to manage its stockpiles. Several factors countervail the tendency towards plurality in policing practices and equipment, however:

- Considered 'auxiliary' to the armed forces, military police corps operate under similar doctrines and organization in all states.
- The protectionist nature of the Brazilian small arms market prevents widespread diversification of calibres, models, and makes among Brazil's police forces, which, with a few exceptions, purchase their firearms from Brazilian firms.
- The administrations of Fernando Henrique Cardoso (1995–2003) and Luiz

Inácio Lula da Silva (since 2003) developed and implemented national public security plans, including economic support to states to purchase new small arms with standardized calibres and models. Field research conducted for this report reveals that most civilian and military police corps are currently adopting .40 calibre Taurus pistols as their standard side arm, as well as .40 Taurus carbines and sub-machine guns (Dreyfus and Nascimento, 2005, p. 117).

In addition to the state police corps, there is a 10,500-strong federal police, which is an investigative force active throughout the country, and a 7,300-strong federal highway police. There are also state fire departments (which in Brazil are lightly armed paramilitary units), state prison guards,³³ municipal guards,³⁴ and judges and magistrates, who in Brazil have the right to request from the state a small arm for self-defence.

In 2004 the federal government created a new law enforcement institution called the National Public Security Force (Força Nacional de Segurança Pública, FNSP). This is an elite uniformed police force that intervenes at the request of state governors in cases of national security emergencies when local law enforcement agencies are overwhelmed. The FNSP does not have permanent staff but is formed of police officers borrowed from the state-level military police and fire brigade corps at the request of the federal government. The National Public Security Secretariat (SENASP) provides training, equipment, uniforms, and weapons, which are stored in Brasília and used only when the force is partially or totally assembled. Up until 2007, SENASP had trained 7,700 police officers from different states. By late 2007, the FNSP was expected to number 10,000 police officers who were to be deployed to provide extra security during the Pan-American Olympic Games in Rio de Janeiro (MoJ, 2006).

Table 2.22 presents the strength of the public security and criminal justice sectors.

Public security agencies and criminal justice³⁶

Table 2.23 shows the holding figures for public security and criminal justice institutions. SINARM provides aggregated figures (for each state) for non-military law enforcement and criminal justice agencies such as the federal

Table 2.22 **Strength of Brazilian public security and criminal justice sectors**

Sector	Federal police	Federal highway police	State-level military police	State-level civilian police	State-level fire departments	FNSP	Other (municipal guards and criminal justice)
Strength	10,500	7,300	384,030	87,288	40,742	(needs-based)	157,824

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Sources: Departamento da Polícia Federal (2005, p. 183; 2006a); Dreyfus and de Sousa Nascimento (2008)³⁵

Table 2.23 **Public security and criminal justice holdings**

Small arms	Non-military police corps (civilian state police, federal police, and federal highway police)	State-level military police	State-level fire departments	National public security force	Other (municipal guards and criminal justice)	Total
Firearms (all types)	193,700	561,600	4,100	10,800	33,000	803,200
Handguns	n/a	520,400	n/a	9,000	n/a	more than 529,400
Pistols	n/a	n/a	n/a	9,000	n/a	9,000
Revolvers	n/a	n/a	n/a	0	n/a	n/a
Long-barrel firearms	n/a	41,200	n/a	1,800	n/a	more than 43,000

Note: Figures have been rounded. Figures in bold are from primary or secondary sources; other figures are estimates.

Sources: Departamento da Polícia Federal (2005; 2006b; 2007); Abdala (2007)

police, the federal highway police, civilian state police corps, municipal guards, prison guards, and the security guards responsible for protecting state and federal buildings and officials (Departamento da Polícia Federal, 2006b). Figures for military state police and military state fire departments are estimates based on questionnaires and interviews. Figures for the FNSP were obtained through a secondary source that quotes Ministry of Justice authorities (Abdala, 2007).

State-level military police and military fire departments

For state military police corps, the multiplier used in this study was based on common responses to questionnaires distributed during field research. Police officers with the military police corps carry a single institutional handgun when in service. In most police corps they are authorized to carry a second private (registered) back-up handgun while on duty. A third small arm, a long-barrel gun, is shared by three police officers and usually stays in the car or at the police station.

This would imply a multiplier of 1.33 (1 handgun + 1/3 long-barrel gun) institutional firearms per agent, in addition to the private back-up handguns (conservatively estimated at one per agent), counted here as a service weapon. Institutional handguns are returned to the police station or barracks after agents have completed their shift. Also common to both police and civilian military corps is the fact that they serve in 8/24, 24/72, and 12/36-hour shifts, so at any given time about one-third of the police force is on duty. This yields a multiplier of:

$$1 \text{ (personal handgun)} + 1.33 \text{ (institutional firearm)} * 1/3 \text{ (agents on duty)} = 1.433$$

In the case of the military police corps, institutional handguns are stored at each police battalion. There is a main stockpile facility in the state capital where surplus weapons are stored while awaiting destruction by the Brazilian Army and newly acquired weapons are stored before being distributed.³⁷

There are important exceptions to these multipliers, however. As discussed in Box 2, these include the military police of the state of Rio de Janeiro (38,594 officers), of the state of São Paulo (92,114 officers), and of the state of Paraná (20,300 officers).

The total holdings for state military police corps was estimated at **561,600 small arms**. This figure includes the above-mentioned 500 FALs recently lent by the Navy to the military police of Rio de Janeiro as well as 1,000 recently purchased .30 M1-calibre CT-30 Taurus carbines to be used in motorized patrols by the military police of Rio de Janeiro (Dreyfus, 2008).

In the case of fire department corps, the use of small arms is restricted to the protection of headquarters and stations. Interviews reveal that there is about one small arm per ten military fire officers, or **4,125 small arms**.

Box 2 Keeping the guns: the military police of Rio de Janeiro, São Paulo, and Paraná

According to an interview with an arms quartermaster NCO who spent more than 20 years with the Rio de Janeiro military police, the corps' standard long-barrel weapon is either an assault rifle (M16 Commando or FAL) or a bolt-action 7.62 mm Mauser rifle (Mosque-FAL). These weapons are only used by members of military police battalions who are close to 'sensitive areas', meaning near *favelas* with a strong organized crime presence. There is one long-barrel rifle for every ten police officers. The military police of Rio de Janeiro is exceptional in that it also uses 7.62 mm Madsen light machine guns donated by the Army. In contrast to other police corps, 12-gauge shotguns are not regularly used in this state.

The multiplier for handguns remains the same as for other police corps: one institutional weapon for every three police officers plus one personal weapon each. In Rio de Janeiro it is common practice for a police officer to carry the personal handgun visibly. Unlike other police corps in Brazil, Rio de Janeiro's military police do not send surplus for destruction. Rather, they apply an 'everything is useful' policy. For example, throughout the 1990s, .38 revolvers were replaced by 9 mm and .40 Taurus pistols, but instead of disposing of the old .38 revolvers, the police kept them. The police also kept 7.63 mm Mauser pistols (*Maschinenpistolen*), INA 9 mm sub-machine guns, 12-gauge shotguns, and 7.62 mm Mauser bolt-action rifles (later replaced by the assault rifles).³⁸

Moreover, old weapons are not kept at the main storage centre. They are stored at stockpile facilities located at each battalion, increasing the possibility of diversion since old weapons are not checked with the same level of rigour as weapons in use. The logic for keeping these weapons is that they will be used in exceptional situations, when all members of the force (including administrative personnel) would be recalled for service in the streets. Examples are riot control, or major events such as Carnival or the organization of the Pan-American Olympic Games.

In the case of the military police of Rio de Janeiro, surplus weapons were calculated by applying the multipliers mentioned above to the strength of that police force in the mid-1990s (28,000), the period when the police started incorporating the pistols and assault rifles that replaced revolvers, bolt-action rifles, and sub-machine guns. Adding holdings and surplus yields 30,118 small arms.

One gun per cop: the military police of the state of São Paulo

In contrast to other police forces, the large São Paulo police force has adopted a 'one handgun per cop' policy. Each military police officer carries an institutional handgun (either a .38 revolver or a .40 pistol) that is taken home at the end of a shift. They may carry a personal weapon while on duty, a practice that is exceptional within the states of Brazil.³⁹

Almost there: Paraná

The state of Paraná, which, like São Paulo, is very rich, also provides one institutional handgun to each military police officer. According to one interviewee, some 60 per cent of police officers have been given their own institutional handgun.⁴⁰

Source: Interview with a quartermaster NCO from the military police of the state of Rio de Janeiro, Rio de Janeiro, May 2007

Non-military police corps: federal police, state civilian police corps, and federal highway police

The federal police is subordinated to the minister of justice and carries out investigations and police operations on federal crimes when mandated by a federal judge or prosecutor. Information on federal police inventories has been published online. Federal police agents generally receive a handgun from the official inventory, which they keep throughout their career, and may also carry a private handgun. They may choose to carry a long-barrel gun (generally a semi-automatic M16A1 or an H&K MP-5 sub-machine gun) on special missions. Interviews show that each local headquarters (located in the capital city of each state) has a storage facility for automatic weapons and ammunition, with approximately one long-barrel gun for every four police officers.

The federal highway police has headquarters in each state capital as well as control stations located along federal highways. Regulations for the distribution and use of small arms are similar to those of the state military police corps. Civilian state police agents carry their institutional handguns at all times. Long-barrel weapons are stored at each police station (*delegacia de policia*) and automatic weapons are stored at the main police headquarters.⁴¹

The total holdings for this group amounts to **193,700 small arms** (Departamento da Policia Federal, 2006b).

Criminal justice and other public security organs

SINARM reports that the number of weapons held by prison guards and other public security bodies, such as municipal guards and security guards of federal and state buildings, is **33,040** (Departamento da Policia Federal, 2006b).

What the numbers reveal

Total small arms holdings in Brazil are estimated at **16,990,200**. These holdings are distributed as shown in Figure 2.3. These statistics reveal some startling facts about the distribution of small arms.

First, **the proportion of legal to illicit holdings is almost 40:60 per cent**. More than half of the circulating firearms are in the hands of either criminals or private citizens in the informal market.

Figure 2.3 Distribution of small arms holdings per group

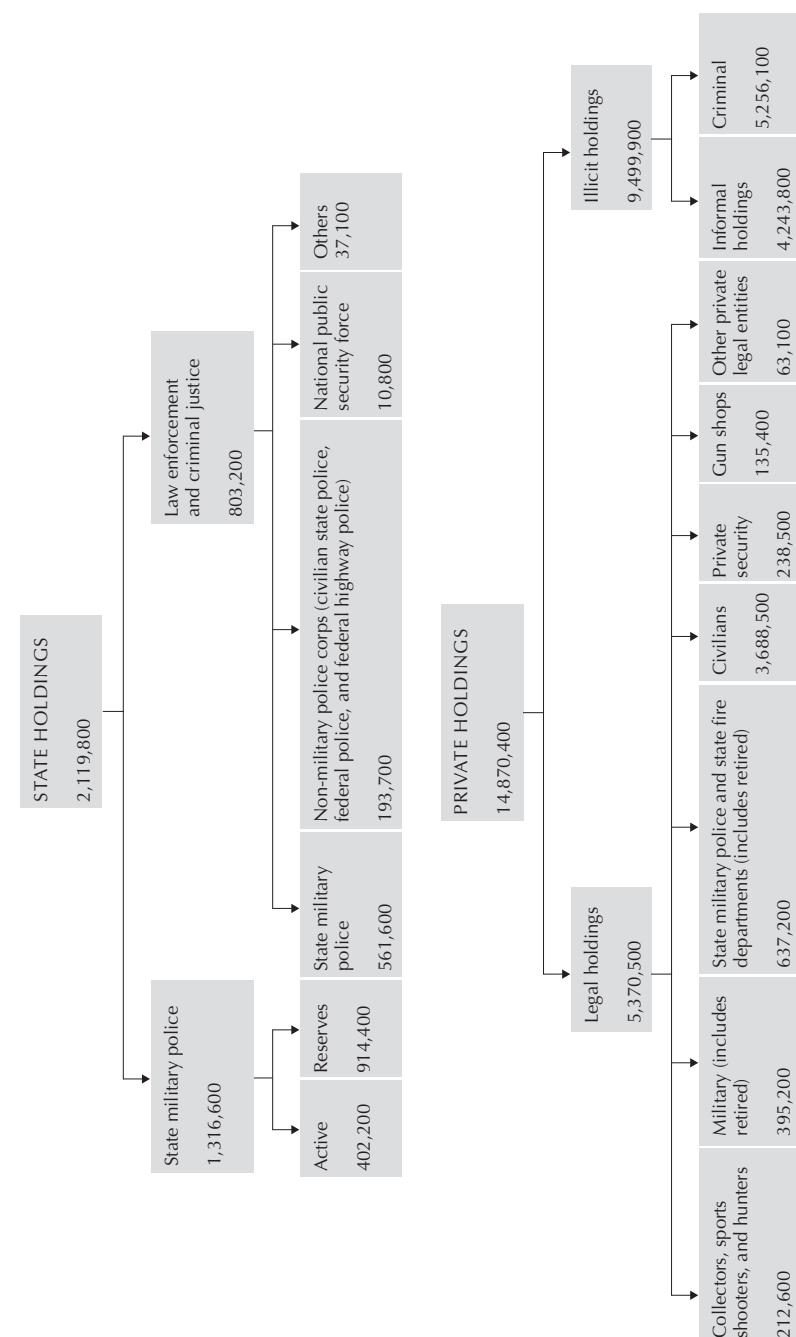


Figure 2.4 **Small arms holdings in Brazil (16,990,200)**

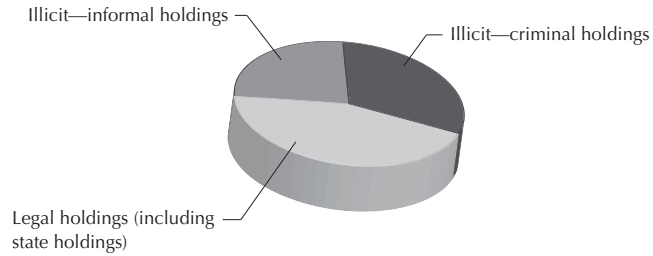


Figure 2.5 **Legal holdings (7,490,300)**

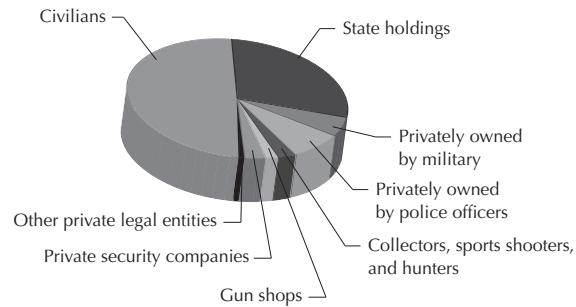


Figure 2.6 **Illicit holdings (9,499,900)**

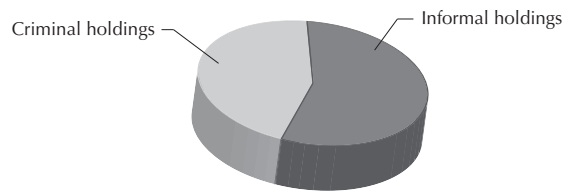


Figure 2.7 **Private civilian legal holdings (4,125,500)**

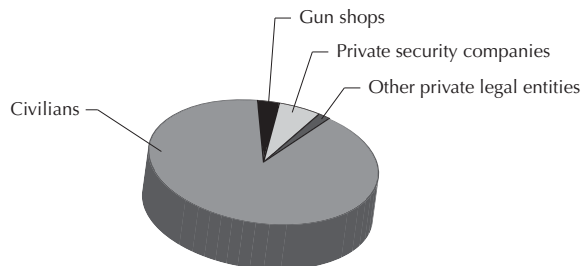


Figure 2.8 **Legal small arms privately held by military and state military police personnel and collectors, sports shooters, and hunters (1,245,000)**

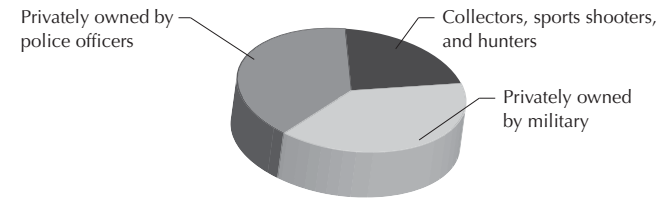


Figure 2.9 **Collectors, sports shooters, and hunters (212,600)**

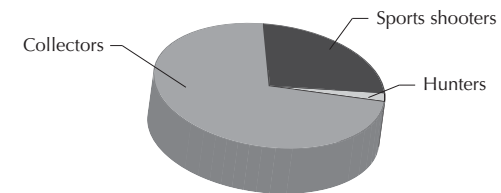
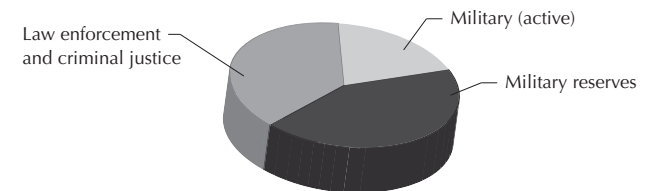


Figure 2.10 **State holdings (2,119,500)**



Controlling the criminal market is a matter of police efficiency, honesty, and intelligence. Controlling the informal market is an even more delicate issue: the state must convince citizens to register or voluntarily hand over their guns (via cash incentives and amnesties for unregistered guns, such as the 2004–05 buy-back campaign which resulted in the handover of 459,855 weapons).⁴²

Small arms migrate from legal to illegal circuits. In Rio de Janeiro, 26 per cent of small arms seized between 1981 and 2003 belonged to legal users who had previously registered them (Câmara dos Deputados, 2006). In São Paulo this propor-

tion was 17 per cent among small arms seized between 2000 and 2003, while in Brasília the proportion was 28 per cent between 2001 and 2003 (Câmara dos Deputados, 2006). If registered weapons, which are theoretically monitored by the state, can migrate in such numbers to criminal circuits, then an even greater flow of unregistered weapons can be expected to end up in the hands of criminals.

A second key finding is that **half of the legal small arms are in the hands of civilians**. The stricter and more expensive registration regime introduced by the Disarmament Statute is expected to result in a decrease in the number of registered small arms. This would be in keeping with the experience of Rio de Janeiro state, which implemented similar measures at the state level in 2001. Such an effect will depend in part on the efficacy of information sharing between the states and SINARM, as well as the ability of the federal police to identify and discipline owners who fail to renew their permits.

Among groups that enjoy easier access to the purchase of small arms—such as military, police, judges, and CAC members—and whose holdings are controlled directly by the Army and not the federal police, the predominant group in terms of number of firearms is the police. This has to do with the ethos of being a police officer ‘24 hours a day’ (even if serving in shifts) and with the fact that off-duty police officers have been murdered, sometimes deliberately and viciously, when intervening in cases of armed robbery.⁴³ Within the CAC, the predominant group is collectors, who can hold large numbers of restricted-use small arms, including semi-automatic military-style rifles, at home. The great risk here is that functional military-style guns will be stolen.

Counting guns: distribution and holders

Beyond a simple estimate of the number of firearms in Brazil, this study seeks to understand how small arms are distributed within each state along rural–urban parameters, and to identify the types of small arms used by the different groups of holders discussed above.

Data collection and analysis was based on questionnaires distributed among state small arms control agencies. Data on seized and registered small arms by type, make, model, calibre, and manufacturer was requested. Although data was not available for every state, a representative sample of the kinds of weap-

ons held and used by civilians, police, and the military in Brazil was obtained, as well as of the types of small arms commonly used in criminal activities.

The methodology adopted involved comparing data from field research against AnEEEx statistics on permitted small arms, which was then compared with interview material to analyse and map the distribution of sales of small arms and ammunition in the civilian market, by decade.

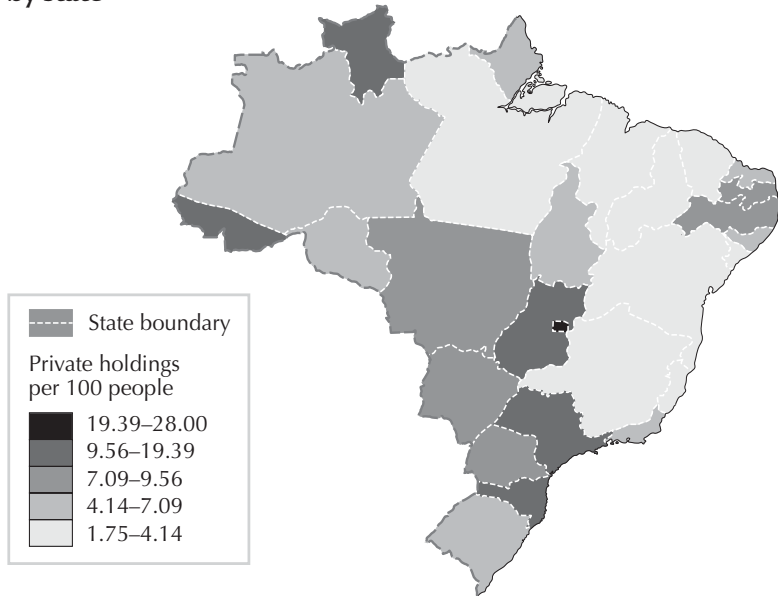
Distribution of (legal and illicit) small arms by holding group

Given information on the numbers of small arms and who holds them (by group), it is possible to map holdings across Brazil. The country is home to 186 million inhabitants, of which 14 per cent are men between the ages of 15 and 29, the group at greatest risk of being killed in small arms-related incidents in Brazil (IBGE, n.d.).⁴⁴

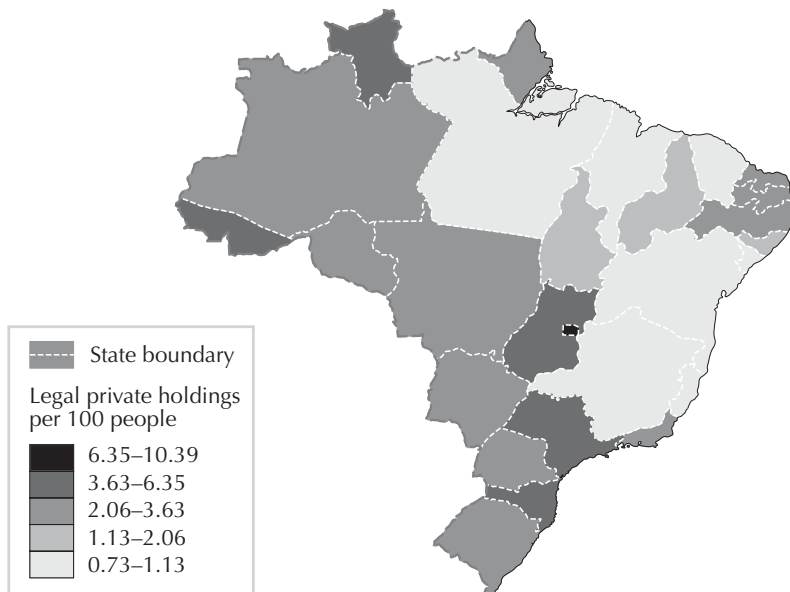
Maps 2.2, 2.3, and 2.4 present data per 100 inhabitants and show the following:

- There are high rates of privately held (legal and illicit) small arms per 100 inhabitants in states that underwent processes of recent colonization (expansion of the agrarian frontier), notably Acre, Mato Grosso, Mato Grosso do Sul, and Roraima. These states received large influxes of young male migrants since the 1970s to work in agriculture (Mato Grosso and Mato Grosso do Sul) or (legal and illegal) extraction of timber, gold, and precious stones (Acre, Roraima). Field interviews carried out for this study reveal that migrants brought with them the ‘cowboy’ (*gaúcho*) gun culture from the south, and the macho culture that characterizes the rough life of peasants in the northeast.
- There is a high rate of privately held small arms per 100 inhabitants in São Paulo, a highly populated state with high per capita income (a condition shared by Goiás Santa Catarina and Paraná, which also have high rates). Here the urban and rural middle classes have been able to purchase small arms in periods of loose or non-existent control and regulations.
- The case of Brasília (Federal District) is particular: a concentration of high income (a reflection of the well-paid public service sector) and public security and military officials who also hold small arms for private use leads to high rates of gun ownership.

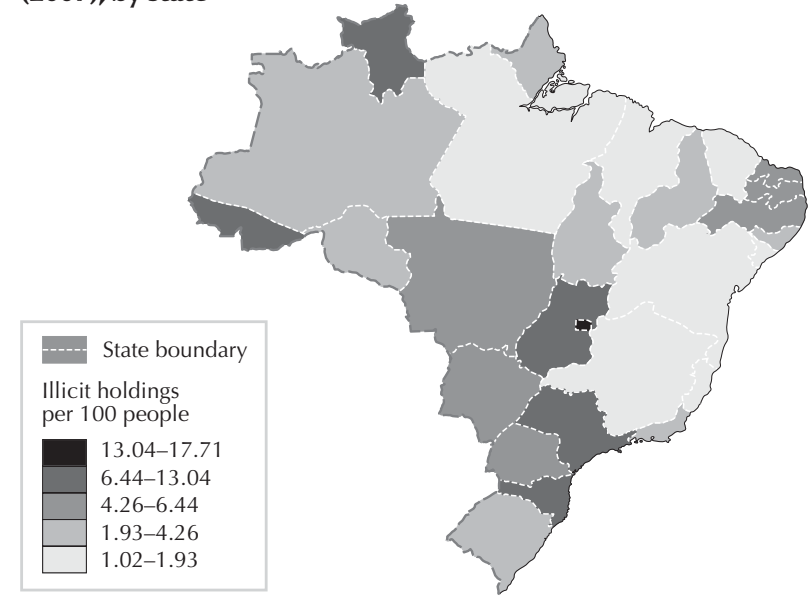
Map 2.2 **Private (legal and illicit) holdings per 100 people (2007), by state**



Map 2.3 **Legal private holdings per 100 people (2007), by state**



Map 2.4 **Illicit (informal and criminal) holdings per 100 inhabitants (2007), by state**



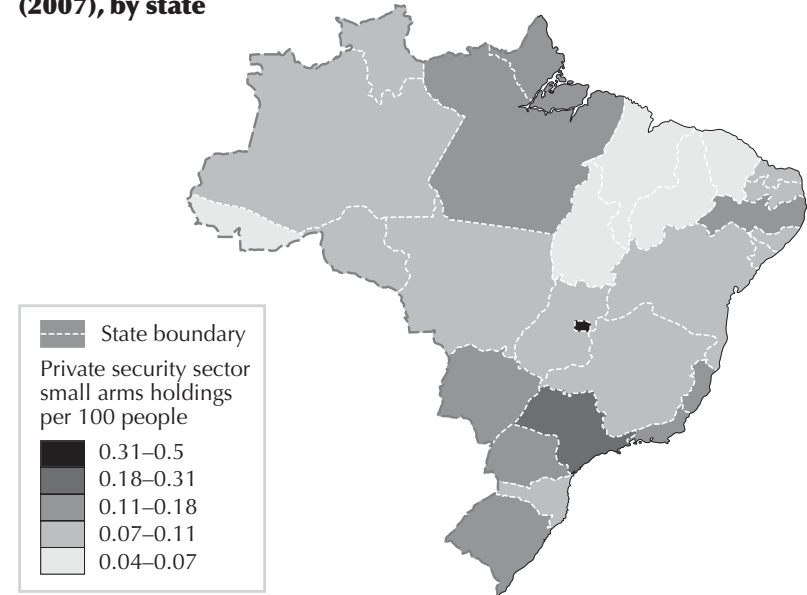
In addition to mapping out individual civilian holdings, it is useful to understand where the military, the police, and private security firms are located. Another important group is the CAC, especially collectors (see Table 2.24). The relevance of these groups is that they stockpile large amounts of small arms and ammunition, sometimes very close to areas with a strong organized crime presence, giving way to cases of corruption and theft. Military sources interviewed, for example, expressed concern that most conscripted soldiers who serve in military bases in the metropolitan area of Rio de Janeiro (where there is a high concentration of military units) come from *favelas* with a strong organized crime presence. These young men may be involved in the theft of arms and ammunition or be recruited at the end of their military service as *soldados do tráfico* (armed members of drug trafficking factions). The distribution of state holdings, private security holdings, and CACs is illustrated in Maps 2.5 to 2.10.

Table 2.24 **Estimated holdings by CAC (2003)**

Military region	Shooters and instructors	Sports shooters' holdings	Hunters	Hunters' holdings	Collectors	Collectors' holdings	CAC holdings
1	3,462	13,132	292	1,168	2,082	73,074	87,374
2	4,415	16,747	456	1,824	2,012	11,066	29,637
3	1,368	5,189	167	668	111	2,129	7,986
4	487	1,847	85	340	166	4,675	6,863
5	1,087	4,123	130	520	182	3,654	8,297
6	38	144	0	0	51	948	1,093
7	508	1,927	21	84	266	5,351	7,361
8	67	254	2	8	21	490	752
9	227	861	1	4	768	14,879	15,744
10	811	3,076	1	4	1,227	22,825	25,905
11	1,292	4,901	18	72	832	15,627	20,600
12	156	592	0	0	42	378	970
Total	13,918	52,792	1,173	4,692	7,760	155,096	212,580

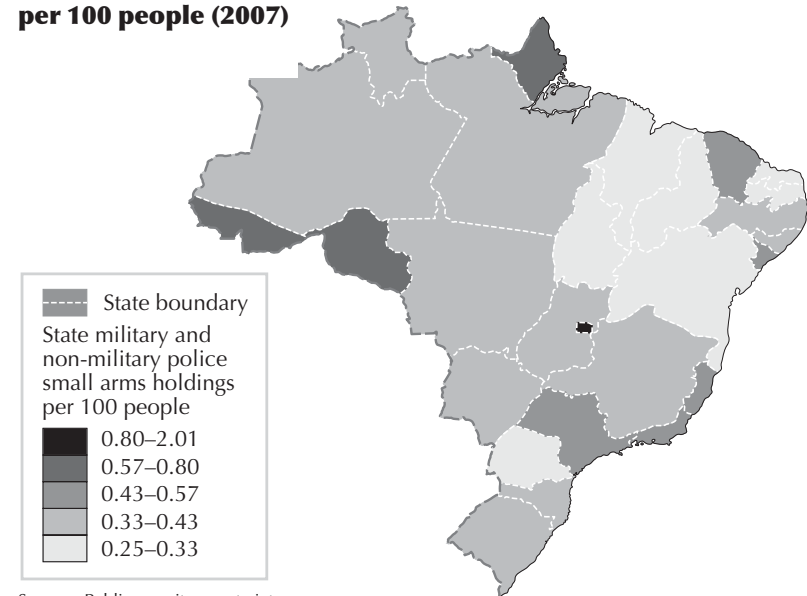
Sources: Ministério da Defesa (2002; 2003)

Map 2.5 **Private security sector small arms holdings per 100 people (2007), by state**



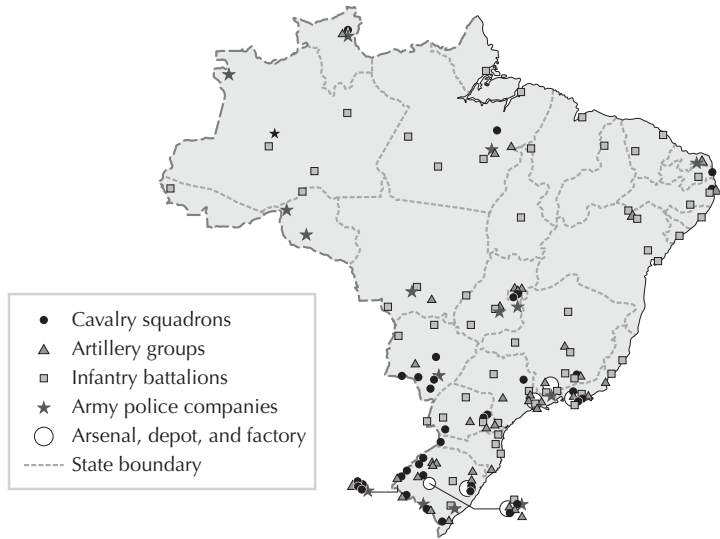
Source: Departamento da Polícia Federal (2006b)

Map 2.6 **State military and non-military police small arms holdings, per 100 people (2007)**



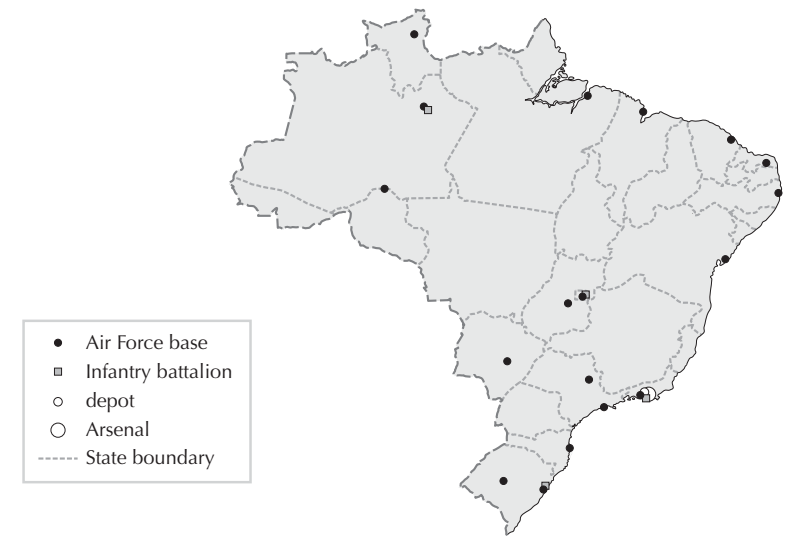
Sources: Public security secretariats

Map 2.7 **Distribution of Brazilian Army bases (and their stockpiles) and main arsenals**



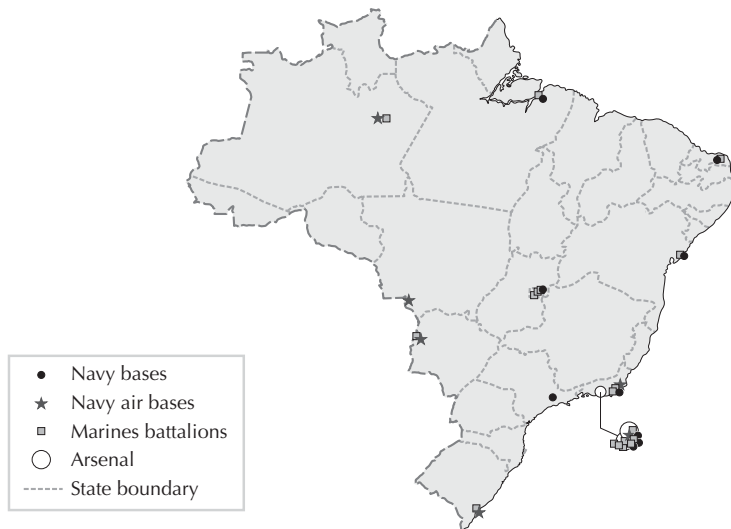
Sources: CENM (2004); Exército Brasileiro (2007b); analysis by Viva Rio/ISER

Map 2.9 **Distribution of Brazilian Air Force bases, infantry battalions (and their stockpiles), and arsenals**



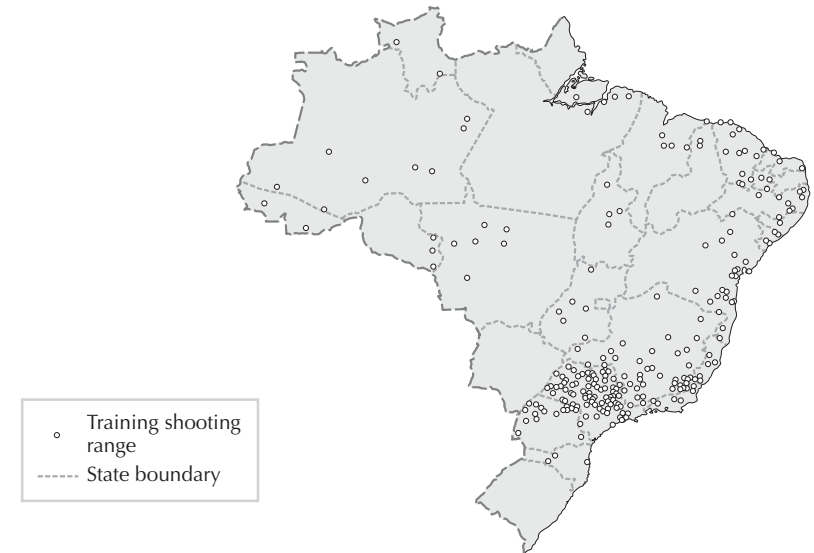
Sources: CENM (2004); Força Aérea Brasileira (2007); analysis by Viva Rio/ISER

Map 2.8 **Distribution of Brazilian Navy bases, Marines battalions (and their stockpiles), and arsenals**



Sources: CENM (2004); Marinha do Brasil (2007); analysis by Viva Rio/ISER

Map 2.10 **Distribution of Brazilian Army reserves shooting ranges**



Source: Exército Brasileiro (2007b); analysis by Viva Rio/ISER

Holding groups at the state level

This section seeks to answer questions relating to the distribution of small arms within each state. Are holdings predominantly found in densely populated metropolitan areas, or are they mostly held by landowners, rural workers, and peasants in rural areas? What kinds of small arms are held by each group? The problems of a big city with a high concentration of automatic weapons in criminal hands are different from those of a mid-sized rural city where robbers use revolvers and pistols. Are the police adequately equipped to deal with such armed violence? Information presented here combines answers to questionnaires and statistical data provided by state-level public security secretariats during field research, as well as answers to interviews conducted by this study's field researcher.

Since not all states answered questions relating to the type of small arms commonly registered and seized, this section presents a case-by-case analysis, highlighting commonalities and differences among different regions of the country.

Urban–rural distribution

Table 2.25 presents qualitative and quantitative data on the urban–rural distribution of small arms from states that provided data. (Source: public security secretariats of various states.)

In states with significant cattle farming, such as Mato Grosso, Mato Grosso do Sul, and Rio Grande do Sul, a single landowner may register several small arms for his employees. These are areas with extensive cross-border cattle theft, and it is common for rural workers (cowboys) to bear arms. This situation also leads to cases in which small arms are purchased by landowners in neighbouring countries (Uruguay and Bolivia) and then transported across poorly policed land borders. These weapons are not registered and can end up in informal rural arms holdings. A completely different type of demand is seen in the urban informal markets in states such as Rio de Janeiro and São Paulo.⁴⁵

Who has what? Types of weapon by holding group

What kinds of small arms are held by each holding group? This question is relevant to the evaluation of the firepower of these holdings as well as an assessment of the adequacy of law enforcement policies.

Table 2.25 **Urban–rural distribution of registered private holdings***

State	Capital city	Metropolitan area	Rural
Acre			In general
Alagoas	In general	In general	
Amazonas			In general (80%)
Bahia			Registered
Ceará			Seized (71%)
Federal District	Registered (100%)		
Espírito Santo		Seized (56%)	
Mato Grosso	In general	In general	
Mato Grosso do Sul			In general
Minas Gerais			Seized (42%)
Pará	Registered, carrying permit		
Paraná	Seized		
Piauí	Registered		
Rio de Janeiro	Seized (46%)		
Rio Grande do Norte	Registered, carrying permit, seized		
Rio Grande do Sul			Registered, carrying permit (64%)
Rondônia			Seized
Santa Catarina	Registered, carrying permit		
São Paulo	Seized (48%)		
Tocantins			In general

Note: * Shading indicates where in each state the largest proportion of firearms are held. When available, percentages are provided to specify the proportion; for example, in Ceará, 71 per cent of the state's seized firearms were seized in rural areas. Four categories are recorded in this table: registered firearms, seized firearms, firearms for which there are carrying permits, and the general perception of levels of holdings.

Individual civilian legal holdings. Although most of the consulted states provided totals of registered and seized small arms, only six public security secretariats answered the questions on type and calibres of registered small arms: Acre, Amapá, Mato Grosso, Rio de Janeiro, Rio Grande do Sul, and Sergipe (see Table 2.26).

Table 2.26 **Proportion of registered small arms by type and state (if available)**

State	Revolver	Pistol	Garrucha	Shotgun	Rifle or carbine	Total number	Period	Handguns	Long-barrel guns
Acre	9%	8%		41%	42%	481	2000–04	17%	83%
Amapá						9,064	1980–2003	66%	34%
Mato Grosso						18,011	1997–2004	51%	49%
Rio de Janeiro	67%	15%	1%	11%	6%	550,965	1951–2003	82%	18%
Rio Grande do Sul	50%	6%		40%	4%	439,110	1950–2004	56%	44%
Sergipe	36%	40%		24%		1,387	1999–2003	76%	24%

Sources: public security secretariats

Table 2.27 **Seized small arms by type and state**

State	Revolver	Pistol	Gar- rucha (small pistol)	Shotgun	Rifle or carbine	Assault rifle	Machine gun	Sub- machine gun	Other	Total number	Period	Hand- guns	Long- barrel guns
Acre										1,177	2001–04	45.0%	55.0%
Alagoas	81.0%	9.0%	0.3%	8.4%	0.7%			0.7%		2,448	2003–06	90.3%	9.7%
Bahia	62.0%	9.0%	5.0%	20.0%	1.0%	0.2%	0.0%	0.0%	2.0%	15,444	2001–03	76.0%	24.0%
Ceará	70.0%	10.0%		15.0%					5.0%	100	2002–04	80.0%	20.0%
Federal District	76.7%	14.6%	1.9%	5.4%	0.9%	0.1%	0.1%	0.0%	0.3%	17,822	1992–2006	91.3%	8.7%
Espírito Santo	70.0%	20.0%		6.0%	4.0%					100	1999–2004	90.0%	10.0%
Goiás	85.0%	14.0%			1.0%					145	1987–2004*	99.0%	1.0%

Mato Grosso	79.0%	8.0%	2.0%	9.0%	2.0%					2,226	1997–2004	89.0%	11.0%
Per- nam- buco	77.5%	7.8%	0.1%	12.3%	2.3%				0.1%	1,713	2003–06	85.4%	14.6%
Piauí	89.0%	9.0%			1.0%				1.0%	180	1999–2000	98.0%	2.0%
Rio de Janeiro	65.0%	15.0%	8.0%	8.0%	1.5%	1.0%	0.0%	0.6%	0.5%	232,997	1951–2003	88.0%	12.0%
Rio Grande do Sul	79.0%	6.0%								22,498**	1972–2004	85.0%	15.0%
São Paulo	62.7%	18.0%	3.5%	12.3%	2.8%	0.2%	0.1%	0.4%	0.1%	43,142	2003–06	84.2%	15.8%

* Data about stolen or lost small arms.

** Of this total, 19,192 are handguns.

Sources: state public security secretariats; Câmara dos Deputados (2006)

The data is patchy, which makes it difficult to draw conclusions about the distribution of weapons across the states. Handguns (revolvers in this case) are the predominant type of small arm held by civilians in Rio de Janeiro, but the situation is different in more rural states such as Rio Grande do Sul and Mato Grosso, where there is a more even distribution between revolvers and shotguns. In Acre, long-barrel guns (shotguns and carbines) are predominant.

Private security. The type of small arm that private guards are authorized to use depends on their level of training. Guards with basic training may use either a .32 or .38 revolver or a .38 carbine. Guards trained to escort valuable goods may carry a .32 or .38 revolver or a 7.65 mm or .380 pistol, and a long weapon, either a 12-calibre shotgun or a .38 carbine. Bodyguards may carry .32 and .38 revolvers or 7.65 mm or .380 pistols for personal security training (Departamento da Polícia Federal, 2006b).

Weapons for the private use of military and police officers. This group may choose to have restricted-use or permitted-use handguns at home. Automatic weapons are not permitted.

The law enforcement community.⁴⁶ Up until the late 1990s, the most common side arm for both civil and military state police corps was a .38 revolver, though military police officers often purchased 9 mm Taurus pistols (generally PT92 Beretta-inspired). Surplus materiel was rarely destroyed. Old small arms would often be stored for spare parts. Since the late 1990s, however, the federal government has supported a nationwide effort to standardize police stockpiles. All state police corps (in line with protectionist policies governing the internal market) are replacing their old .38 revolvers and 9 mm pistols with .40 calibre Taurus pistols. Most of the police corps members consulted said older parts were not compatible with the new standard armament; surplus weapons are thus being systematically sent to the Army for destruction.

The Disarmament Statute bars captured and seized weapons from being incorporated into police holdings, a situation that was common before. Since December 2003, legislation has required seized weapons to be destroyed within 48 hours of clearing forensic analysis.

The long arms used by state police corps are mainly 12-gauge pump-action shotguns, the newly incorporated .40 and .30 Taurus carbines, and in the case

of special operations teams, sub-machine guns. Assault rifles and sub-machine guns are generally used for international border patrol, highway checkpoints (to be used in case of truck theft), and in certain special operations such as freeing hostages. There are exceptions, however: in Rio de Janeiro and Espírito Santo the police use assault rifles (M-4 carbines and FALs in Rio and FALs in Espírito Santo) for routine urban police activities. The police of Minas Gerais also increasingly use the new MD97 assault rifle in their metropolitan patrol units. Law enforcement officials claim these weapons are needed to match the firepower of criminal organizations. The standardized carrying of fully automatic weapons in densely populated areas may represent more of a threat than protection.

Federal police agents generally use 9 mm or .40 pistols as service weapons and semi-automatic M16 versions or an MP-5 sub-machine gun when in special operations.

Armed forces.⁴⁷ The standard Army assault rifle is the FAL 7.62, manufactured by IMBEL (some Belgian FALs are still in service). Some 5.56 mm versions of the FAL have been manufactured by IMBEL for light infantry units (*caçadores*). Side weapons include 9 mm and .45 IMBEL pistols. Special operations units may use M-4 carbines and MP-5 sub-machine guns.

The Marines use US-made M16A2 assault rifles as their standard rifle. Old IMBEL FAL rifles are still used by the Marines in training and by the rest of the Navy for the protection of ships and bases. Side weapons include PT92 and Beretta 9 mm pistols. The Marines' special operations teams use Uzi sub-machine guns, MP-5 sub-machine guns, and M-4 carbines.

The Air Force uses G-3 and HK-33 assault rifles bought from Germany in the 1970s. Special operations teams use MP-5 sub-machine guns. The PT92 Taurus is used as a side arm.

Illicit holdings. Numerous states provided information on types of seized weapons, allowing for a more comprehensive analysis of illicit holdings (see Table 2.27).

With the exception of Acre (where long-barrel guns are predominant among legal holdings), handguns (most commonly revolvers, followed by pistols) are the predominant type of weapon seized by police. Only in Rio de

Janeiro does the proportion of military-style small arms (assault rifles and sub-machine guns) exceed one per cent (at 1.65 per cent). In other states, seizures of assault weapons are not significant.

Information about makes and manufacturers was provided by São Paulo, the Federal District, and Rio de Janeiro. In these cases .38 Taurus and Rossi revolvers and .380 Taurus pistols are predominant, which reflects the legal small arms market. In Rio de Janeiro, in contrast, the number of foreign restricted-use small arms seized by the police was double the amount of Brazilian-made restricted-use small arms seized.⁴⁸ Permitted-use small arms can be purchased freely in gun shops, while restricted-use firearms can only be purchased directly from the factory by law enforcement agencies or if authorized by the Army and CAC members. The presence of restricted-use weapons therefore indicates that either small arms were diverted from state actors, or they were trafficked internationally, or both. The predominant calibre of restricted-use weapons is 9 mm.

Because of the lax controls for purchasing permitted-use small arms and the predominance of the domestic arms industry in arms sales, it is safe to assume that most of the revolvers and pistols seized in the other states, which did not provide information on makes and manufacturers, were also made in Brazil.

Conclusion

Like so many other socio-economic factors, small arms possession is extremely heterogeneous across Brazil's many states and geographical regions. Poor registration and inadequate control may be the norm, but they manifest themselves in different ways, from the unregistered .38 revolver that ends up in the hands of criminals in a *favela* of São Paulo or Rio de Janeiro, to the unregistered rifle or shotgun on state land in Mato Grosso or Rio Grande do Sul, to the shotgun used to guard illegal gold mines in Rondônia.

As such, the problem of small arms cannot be analysed through a single lens. Regional and local realities must be considered before adequate control policies can be proposed. Still, these realities are ultimately interlinked in the country as a whole, and are subject to influence through national legislation and institutions. Knowing where the small arms go, what their legal status is,

and which groups hold them is a first step towards the efficient implementation of small arms control policies and laws. This is of utmost importance in a country where, as revealed in this study, 56 per cent of holdings are estimated to be either criminal or informal. ■

Appendix 2: Questionnaires used during field research

Questionnaire 1: holdings, inventories, and stockpiles

Registered firearms and carrying licences:

1. How many firearms were registered (per year) by civilian individuals since the year registration began in your state? Are these newly registered firearms or does this data include renovations and property transfers? Please give information about type and calibre.
2. How many firearms were registered by civilian legal entities since the year registration began in your state? Are these newly registered firearms or does this data include renovations and property transfers? Please give information about type and calibre.
3. Same as questions 1 and 2 but referring to licences to carry. Please differentiate between licenses to carry issued to civilian legal entities, civilians, police agents, military officers, and NCOs.
4. Before the enactment of the Disarmament Statute, which state agencies were responsible for registering firearms and issuing licences to carry?
5. Regarding Article 22 of the Disarmament Statute, did your state government come to any cooperation agreement with the federal police for the registration of firearms? If yes, please name the state agency that currently registers firearms and issues carrying licences.
6. What are the changes introduced by the Disarmament Statute in terms of procedures for registering firearms and issuing licences to carry? If there have been no changes yet, what changes are expected?
7. Is there a centralized database for registered firearms and licences to carry in your state? Would you make that information available for this research?
8. Which locality in your state has the highest number of registration or carrying requests? Is it rural or urban?

Seized firearms:

1. What is the total number of small arms seized in your state? Please provide a historical series of that data (per year).
2. Please distribute that data by calibre and type.
3. How many firearms belonging to the state's inventories are reported as stolen or lost per year?
4. What, approximately, is the quantity of ammunition seized annually in your state?
5. Which agency is responsible for storing seized firearms and ammunition in your state?
6. What happens to seized arms and ammunition from the moment of seizure?
7. Does your state government have a centralized seized firearms database? Would you make that information available for this research?
8. Which locality (urban and rural) has the highest arms and ammunition seizures?
9. Is there a central state deposit for seized firearms and ammunition? If yes, which agency is currently administering the deposit and how many firearms are currently stored there? If no, where are seized firearms and ammunition stored?
10. Was there a change in seizing and storage procedures after the enactment of the Disarmament Statute? If there were no changes, do you expect changes in the near future?

State holdings, stockpiles management, and security:

A) Civilian police:

(a) What is the total number of personnel in the civilian police? (b) How many small arms are carried by each agent when in service? (c) Please describe the work shifts used in your police force (frequency and duration).

Does your police agency use standardized small arms calibres, makes, and models? What is the adopted standard for:

Handguns

Long-barrel guns

Does your agency have standardized procedures for marking, identification, and safety of institutional holdings and stockpiles?

What is the procedure followed for the forensic analysis of civilian police small arms involved in shootings? Is there an official deposit for the storage of these weapons?

B) Military police:

(a) What is the total number of personnel in the military police? (b) How many small arms are carried by each agent when in service? (c) Please describe work shifts in your police force (frequency and duration).

Does your police agency use standardized small arms calibres, makes, and models? What is the adopted standard for:

Handguns

Long-barrel guns

Does your agency have standardized procedures for marking, identification, and safety of institutional holdings and stockpiles?

What is the procedure followed for the forensic analysis of military police small arms involved in shootings? Is there an official deposit for the storage of these weapons?

C) Other state agencies:

Approximately how many small arms belonging to state inventories have been distributed among officials of the state judiciary and legislature?

Is any standard adopted for these small arms (calibre, model, make)?

Are there standardized procedures or rules for identification, marking, and security of state holdings and inventories?

Questionnaire 2

State firearms purchasing and surplus management policies and state small arms control laws:

In which year did arms registration begin in your state?

What is the current number of gun shops in your state? How does this compare to a decade ago?

Does your state have a law regulating the sale of small arms as is the case in Rio de Janeiro?

If yes, please give/send us a copy of the law or give us a reference number to locate it in the *Official Gazette*.

If yes, did the local firearms law provoke a change in the availability of firearms in your state?

Is your government currently buying new small arms for the police?

Do your public security authorities purchase one small arm for each police agent?

How do you dispose of your surplus small arms?

Endnotes

- 1 This Special Report is an expanded and updated version of Dreyfus and Nascimento (2005). New information appearing in this chapter regarding police and military holdings and stockpiles was collected, processed, and analysed by the authors in 2007 as part of the research for Karp (2009).
- 2 Interviews for this study were conducted by field researcher Luiz Carlos Carvalho Silveira, who collected data in 25 Brazilian states. See interview list in the bibliography.
- 3 Brazil is a federal republic made up of 26 states plus the Federal District.
- 4 Until 2000 there was no Ministry of Defence in Brazil; there were three separate ministries for each branch of the armed forces (Army, Navy, and Air Force). The ministries were headed by an Army general, a Navy admiral, and an Air Force general (lieutenant-brigadier), respectively.
- 5 Some of the specific technical aspects of the Statute were regulated by subsequent administrative resolutions of the Directorate of Controlled Products of the Brazilian Army and the federal police.
- 6 The exceptions were Amazonas, Bahia, the Federal District, Pará, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, and São Paulo.
- 7 These weapons had purely numeric serial numbers. After 1981, Taurus began using alphanumeric combinations for its revolvers. On this issue, see Tocchetto (2003, pp. 99–113).
- 8 Some 5,870 weapons (60 per cent of which were revolvers) were collected at Viva Rio's collection posts; 1,327 were Taurus revolvers. For more information, see Goulart and Amora (2004).
- 9 Interviews with SINARM officials, Brasília, 2004.
- 10 In Brazil, NCOs are generally called *sargentos* (sergeants); this category does not include corporals, who are counted with soldiers and sailors.
- 11 The total armed force is 314,300, with 33,800 officers and 96,000 NCOs. See CENM (2004, pp. 112–51).
- 12 This multiplier is arrived at as follows: 15 years of retirement pension / (15 years of retirement pension + spouse's 10-year benefit from pension + dependent children's 20-year benefit from pension).
- 13 Interview with an arms collector in Rio de Janeiro, November 2003. See also Arruda (1999).
- 14 According to the head of the DFPC, Brig.-Gen. José Rosalvo Leitão de Almeida, between 1998 and 2005 the Army destroyed 748,177 seized small arms. From 7 August 2004 to 30 July 2005, the Army destroyed 253,321 weapons, of which 187,803 were collected in the national small arms collection campaign. See Câmara dos Deputados (2005, pp. 6, 8; United Nations, 2001).
- 15 In Rio de Janeiro and São Paulo the number of civilians killed by the police reached 1,195 and 868, respectively. For more on extrajudicial killings, which are frequent in Brazil, see Global Justice (2004) and Cano (1997).
- 16 In undertaking a study on the diversion of military and police small arms (by theft or corruption), ISER analysed information in the Division of Control of Firearms and Explosives database of crime-related seized arms and found 244 IMBEL assault rifles (calibres 7.62 and 5.56 NATO), 579 sub-machine guns produced in Brazil (INA, URU, and Taurus–Beretta 9 mm and .45), and 109 Colt M16 assault rifles with serial numbers beginning with the letters AO, an indication that they belonged to the Rio de Janeiro military police. All the weapons included in this list are restricted-use and can only be owned, purchased, and imported by law enforcement and police forces.
- 17 A soldier of the local military police corps (uniformed police) earns USD 435–1,000 per month (figures presented at a public security conference by high-ranking police officers of Rio de Janeiro and São Paulo, Rio de Janeiro, May 2007); an army conscript earns USD 52 per month; a professional soldier USD 208 per month; a corporal USD 308 per month; and sergeants earn from USD 564 (third sergeant) to USD 1,072 per month (under lieutenant, equivalent to sergeant major), according to CENM (2004, p. 129).
- 18 Interview with a high-ranking member of the Brazilian Army, Rio de Janeiro, April 2007.
- 19 Interview with a high-ranking officer of the East Military Command, Rio de Janeiro, April 2007.
- 20 See also the section on 'Public security agencies (law enforcement) and criminal justice: strength and holdings', below.
- 21 Interview with a reserve officer who served with a self-propelled artillery group, Rio de Janeiro, April 2008. The use of all kinds of artillery pieces may be observed in the following videos: <<http://www.youtube.com/watch?v=liTBVr3knOs>>; <<http://www.youtube.com/watch?v=BRxCUCdwGjw>>; <<http://youtube.com/watch?v=ZkOxksRWicA>>.
- 22 The crew includes the driver of the towing vehicle or of the artillery piece when self-propelled, according to interviews with an Army artillery reserve officer, Rio de Janeiro, 2007.
- 23 Interview with a high-ranking officer and an intermediate officer of the Brazilian Army who serve at the Army General Staff of the East Military Command, Rio de Janeiro, April 2007.
- 24 Interview with a high-ranking officer and an intermediate officer of the Brazilian Army, both of whom serve at the Army General Staff of the East Military Command, Rio de Janeiro, April 2007.
- 25 Interview with a high-ranking officer and an intermediate officer of the Brazilian Army, both of whom serve at the Army General Staff of the East Military Command, Rio de Janeiro, April 2007.
- 26 Interviews with a high-ranking officer of the East Military Command, Rio de Janeiro, April, 2007; a retired admiral, Rio de Janeiro, 2004; and an active-duty NCO of the Marines, Rio de Janeiro, 2004.
- 27 Interview with an active-duty NCO from the Marines, Rio de Janeiro, 2004.
- 28 Interviews with a retired intermediate Air Force officer and a retired admiral, Rio de Janeiro, 2004 and April 2007, respectively.
- 29 As for the Navy and Army, this study estimates that one old Mauser rifle is held per conscript for either parading or heavy training. Interviews with a retired intermediate officer of the Brazilian Air Force and a retired admiral, Rio de Janeiro, 2004 and April 2007, respectively.
- 30 Interview with a high-ranking officer of the East Military Command, July 2007.
- 31 Interview with a high-ranking officer of the East Military Command, Rio de Janeiro, April 2007.

32 The federal railway police exists only on paper and was never created or granted personnel
or equipment. Interview with a close adviser to the Minister of Justice, Brasília, 2005.

33 Brazil did not have a federal prison system until 2004.

34 Some cities in Brazil have municipal police charged with taking care of public buildings and
monitoring transit; in some cases, these guards are armed with revolvers. The Disarmament
Statute declares that cities with more than 250,000 inhabitants may have armed municipal
guards, provided they meet a set of very strict requirements, mostly related to adequate
training.

35 The following information and sources were consulted for the estimates in Dreyfus and
Nascimento (2008): field research in Brazilian states (questionnaires and interviews), the
number of police officers in service, the weapons they use, and typical work shifts;
secondary sources (press releases) checked by the appropriate institution (federal police and
federal highway police); primary sources (for example, the Rio de Janeiro state government
publishes data on the number of police officers on its official police website); police gazettes
and other publications; the 2000 Census (published by the Brazilian Institute of Geography
and Statistics, IBGE), which provides information about the number of inhabitants per state
according to their job.

36 Unless otherwise stated, information for this section draws from Dreyfus and Nascimento
(2008).

37 Interviews with commanding officers of the military police of Paraná, Rio de Janeiro, and
Pernambuco, February 2003–April 2005.

38 INA was closed by the military after the 1964 coup, apparently because of grievances by the
owner against the military government. Interview with gunsmith Amilcar Damaso, owner
of Guntec: Tecnologia em Armamento, Rio de Janeiro, July 2004.

39 E-mail interview with a superior officer of the military police of the State of São Paulo,
July–August 2007.

40 E-mail interview with a superior officer of the military police of the State of Paraná,
July–August 2007.

41 Interviews with police agents from the states of Paraná, Pernambuco, Rio de Janeiro, and
Rio Grande do Sul, 2004.

42 For more information, see Viva Rio (2002).

43 Interviews with active-duty and retired federal and state police officers.

44 With the advent of the Disarmament Statute, the legal age for possession rose from 21 to 25.
Police officers may buy small arms from the age of 18.

45 Interview with field researcher Luiz Carlos Carvalho Silveira, 2004.

46 Information gathered through field research and questionnaires.

47 Interview with Col. Alte S. E. Zylberberg, superintendent of the Itajubá Plant of IMBEL,
Itajubá, 4 May 2004; interview with active-duty military personnel (Marines and Army); and
interview with the owner of a firm that imports small arms for law enforcement agencies,
Rio de Janeiro. See also the national inventories sections of Jane’s (n.d.).

48 As agreed in the memorandum of understanding between the civilian police of the state of
Rio de Janeiro and Viva Rio, the authors of this report analysed Rio de Janeiro’s database of

seized small arms from the Division of Control of Firearms and Explosives. The findings of
this analysis were that restricted-use small arms represented about 8.5 per cent of total
seizures during the 1990s.

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List of field interviews (Chapter 2)

- Delegado Luiz Paschoal de Alcântara Neto, Civilian Police of the State of Pará.
- Mrs. Márcia Cristina Alves, Superintendent of Crime Prevention of the Social Defence Secretariat of the State of Minas Gerais.
- Delegado Walter Barros, Delegacia Legal, Civilian Police of the State of Rio de Janeiro.
- Tenente Coronel Roberson Bondaruk, Military Police of the State of Paraná.
- Delegado Aristóteles Bridi, Chief of the DAME of the Civilian Police of the State of Rio Grande do Sul.
- Sérgio Bringel, press adviser of the Public Security Secretariat of the State of Amapá.
- Dr. Edilamar Calazans, Cabinet Chief of the Civilian Police of the State of Bahia.
- Adailson Calheiros, press adviser of the Public Security Secretariat of the State of Alagoas.
- Major (Military Police) Álvaro Batista Camilo, Public Security Secretariat of the State of São Paulo.
- Inspector Nodege F. de Carvalho Nogueira, Chief of the Firearms Sector of the Civilian Police of the State of Ceará.
- Delegada Celma Couto, Chief of the Civilian Police of the State of Espírito Santo.
- Dr. Raimundo Cutrin, Secretary of Public Security of the State of Maranhão.
- Delegado Luiz Carlos Dantas, Chief of the Intelligence Superintendence of the Civilian Police of the State of Ceará.
- Delegada Sandra Dantas, Chief of the Civilian Police of the State of Amapá.
- Delegado Deraldo Escatolon, Civilian Police of the State of Rondônia.
- Delegado Egivaldo de Farias, Chief of the Statistics Sector of the Civilian Police of the State of Alagoas.
- Delegado Victor Sebastião Gonçalves, General Director of the Civilian Police of the State of Mato Grosso.
- Delegado Joldeci, Chief of the DAME of the State of Rio Grande do Norte.
- Dr. Túlio Kahn, Public Security Secretariat of the State of São Paulo.
- Brigade General José Rosalvo Leitão de Almeida, Head of the Directorate of Controlled Products (DFPC) of the Brazilian Army.
- Delegado Emir Maia, Chief of the DAME of the State of Piauí.
- A. P. C. Marques, Chief of the Firearms Sector of the Civilian Police of the State of Amapá.
- Special Agent Marques, Rio de Janeiro SINARM office, Federal Police.
- Mr. Medrado, Civilian Police of the State of Goiás.
- Delegado Roberto de Mello Aníbal, Chief of the DAME of the Civilian Police of the State of São Paulo.

Mrs. Graça Mendes, Chief of Statistics of the Public Security Secretariat of the State of Pará.
Dr. Martha Mercucci, Civilian Police of the State of Tocantins.
Delegado Luiz Fernando do Nasicmento, Chief of the Office of Public and Social Order (DEOPS) of the Civilian Police of the State of Amazonas.
Mrs. Nizlete, Assistant to the Director of the Civilian Police of the State of Mato Grosso.
Delegado Nordman, Civilian Police of the State of Maranhão.
Delegado João Carlos Passos, Chief of the Division of Firearms Ammunition and Explosives (DAME) of the Civilian Police of the Federal District.
Dr. Paulino, Civilian Police of the State of Mato Grosso.
Delegado Ilzomar Pontes, Chief of the Civilian Police of the State of Acre.
Delegado Robson, Civilian Police of the State of Maranhão.
Dr. Rogério, Civilian Police and Public Security Secretariat of the State of Paraná.
Delegado (Federal Police) Fernando Oliveira Segovia, Head of SINARM, Federal Police Department.
Delegado Marcos Silva, Chief of the Division of Firearms, Ammunitions and Explosives (DAME) of the Civilian Police of the State of Minas Gerais.
Dr. Iracema Silva de Jesus, Chief of the Statistics Sector of the Public Security Secretariat of the State of Bahia.
Mr. Nonato Souza, press adviser of the Public Security Secretariat of the State of Acre.
Delegada Suerda, Civilian Police of the State of Rio Grande do Norte.
Major (Military Police) Carlos Alberto Teixeira Pinto, Public Security Secretariat of the Federal District.
Delegado Humberto Jesus Teixeira, Office of the Police Chief of the State of Goiás.
Lieutenant Colonel Jorge Toledo Freitas, DFPC, Brazilian Army.
Col. Angelo Ubiratan, Military Police of Rio de Janeiro.
Delegado Marcelo Vargas, Civilian Police of the State of Mato Grosso do Sul.
Delegado Geraldo Veloso, Chief of the Division of Firearms and Explosives (DAME) of the Civilian Police of the State of Paraíba.
Delegada (Federal Police) Silvana Helena Vieira Borges, General Coordinator of the Office for General Coordination of Private Security Control of the Federal Police Department.
Delegado Arilton Zanelatto, Chief of the DAME of the Civilian Police of the State of Santa Catarina.
Staff of the Division of Control of Firearms and Explosives (DFAE) of the Civilian Police of the State of Rio de Janeiro.
Staff of the Firearms Sector of the Civilian Police of the State of Espírito Santo.