

Brazilian Software: On a Path Towards a World-Class Industry?

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BRAZILIAN SOFTWARE - OUTLINE

- **The importance of the Software Industry**
- **Software in the Developing World**
- **Prescriptions for the development of the industry**
- **The development of the Brazilian Software Market**
- **The Curse of the Domestic Market**
- **The Promise of the domestic market**
- **Conclusions**

THE INTERNATIONAL SOFTWARE MARKET


- **Global software & services: USD 300 Billion in 2001**
- **Packaged software market**
 - Sales of \$ 196 Billion in 2001
 - Traded share of sales is 15%
- **Software related services**
 - Market smaller than products
 - Traded share is bigger: 35%
- **Offshore / outsourcing (BPO) exhibits strongest growth**
 - in the US, 25% per year
 - In Europe, it will double between 2002 and 2005

The international Software Context in 2000

Country	Sales (\$10 ⁶)	Exports (\$10 ⁶)	Workers	Share of GDP	Growth 91-00
US*	>200,000	n.a.	1,042,000	2%	360%
Japan	85,000	73	534,000	n.a.	n.a.
India	5,800	3,900	350,000	3%	1000%
Ireland	7,650	6,500	25,000	11%	330%
Israel	3,700	2,600	35,000	n.a.	490%

Various Sources

Emerging Prescriptions based on the 3 I's

- Nurture a Strong Human Capital Base
 - Foster Entrepreneurship
 - Develop a Large Export Base
 - Establish a strong Anchor to the US Market
 - Export Base
 - Multinational Investment
 - Leverage the US Links
 - Diaspora
 - English
 - Culture
- 

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Ireland	7,650	6,500	25,000	11%	330%
Israel	3,700	2,600	35,000	n.a.	490%
Brazil	7,200	100	158,000	1%	490%
China	7,400	400	186,000	0.7%	n.a.

Competitive Advantage in Software

	All manufacturing		Software		Comparative advantage		IT Grads	Research
(\$ '000)	Rev per empl (1)	V.A. per empl (2)	Rev per empl (3)	Index 1 (3)/(1)	Index 2 (3)/(2)			
USA	206	98	192	0.6	1.3	25,000	+10%	
Finland	232	76	83	0.4	1.1	n.a.	n.a.	
India	21	4	17	0.4	2.2	73,000	n.a.	
Ireland	242	117	306	0.6	1.2	n.a.	6.5/0.5%	
Israel	112	38	106	0.9	2.6	n.a.	n.a.	
Brazil		14	46		3.3	15,000	8%	

- # **Understanding The Brazilian Software Industry**
- **Looked at History and Context**
 - **Interviewed Leading Local Firms and MNCs**

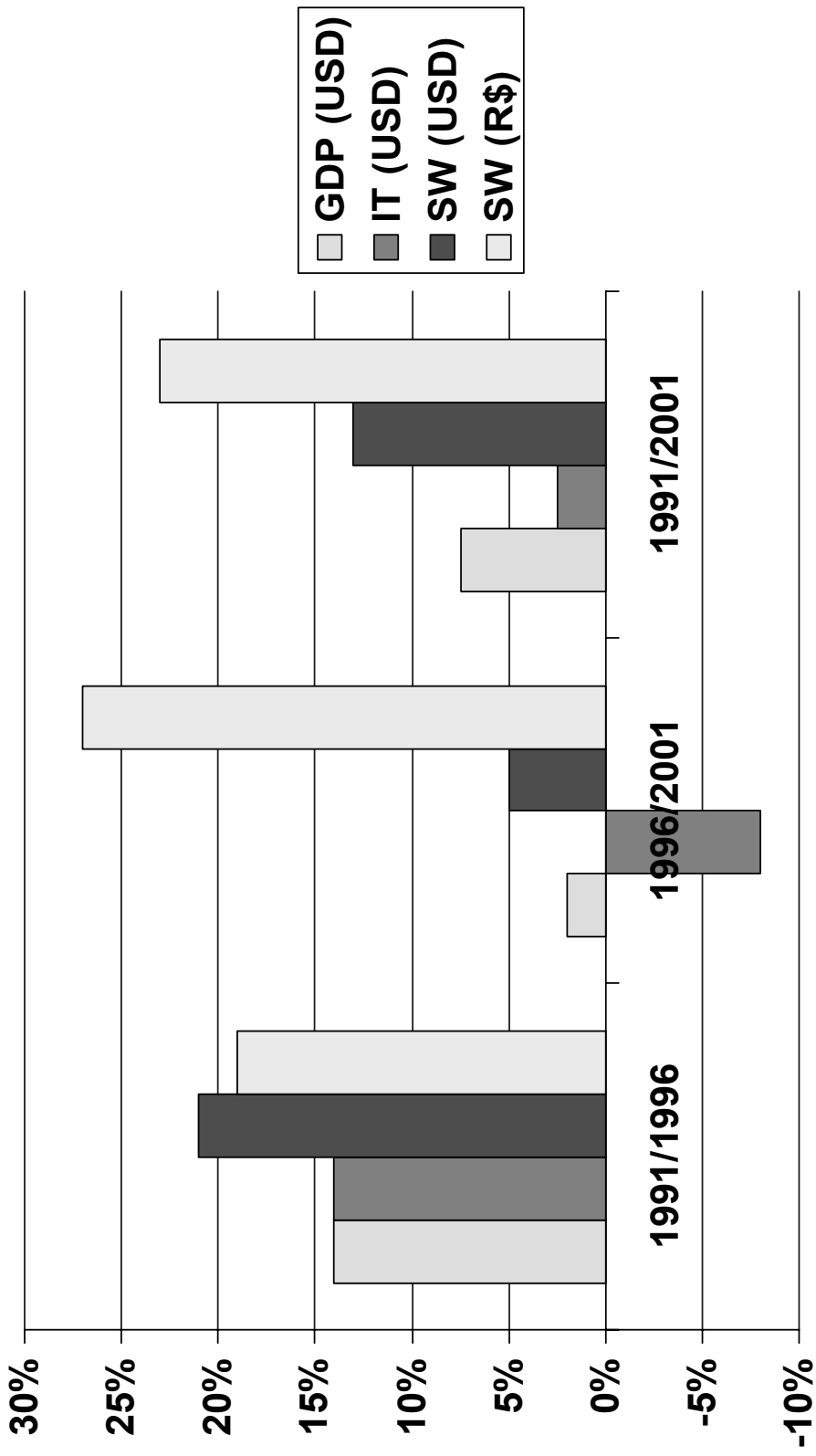
A legacy of Inward Development

- **Stage I (1970 to 1980): Autarky and Inward Development**
 - Objective: Develop indigenous hardware industry
 - FDI by major foreign producers
 - Establishment of local hardware and software firms
 - Slow adoption of (backward) computers
 - No software IP enforcement

- **Stage II (1980 to 1992): Loosening up...**
 - Some restrictions lifted but focus still in Hardware
 - Software has backstage... mostly done in-house in relevant markets
 - Passed strong copyright law only in 1987

- **Stage III (1992-...): Liberalization and industry re-birth**
 - Market Liberalization for hardware and software
 - Informatics Law – Incentives if local firms expended 5% sales in R&D
 - Strong demand and import growth
 - Initiatives directed solely at Software promotion – Softex in 1992

GAGR of the Brazilian Software Industry



FIGURES FOR BRAZILIAN SOFTWARE

	2000		2001	
	USD*	%	USD*	%
Hardware	7,0	40,7	7,2	40,0
Services	3,0	17,5	3,1	17,5
Software (Products and Services)	7,2	41,8	7,7	42,6
Products (Package, Custom and Embedded)	3,2	18,6	3,6	20,0
Services (Outsourcing, Development, Integration and Consultancy)	4,0	23,2	4,1	22,6
Total IT Industry	17,2	100,0	18,0	100,0

Various Sources

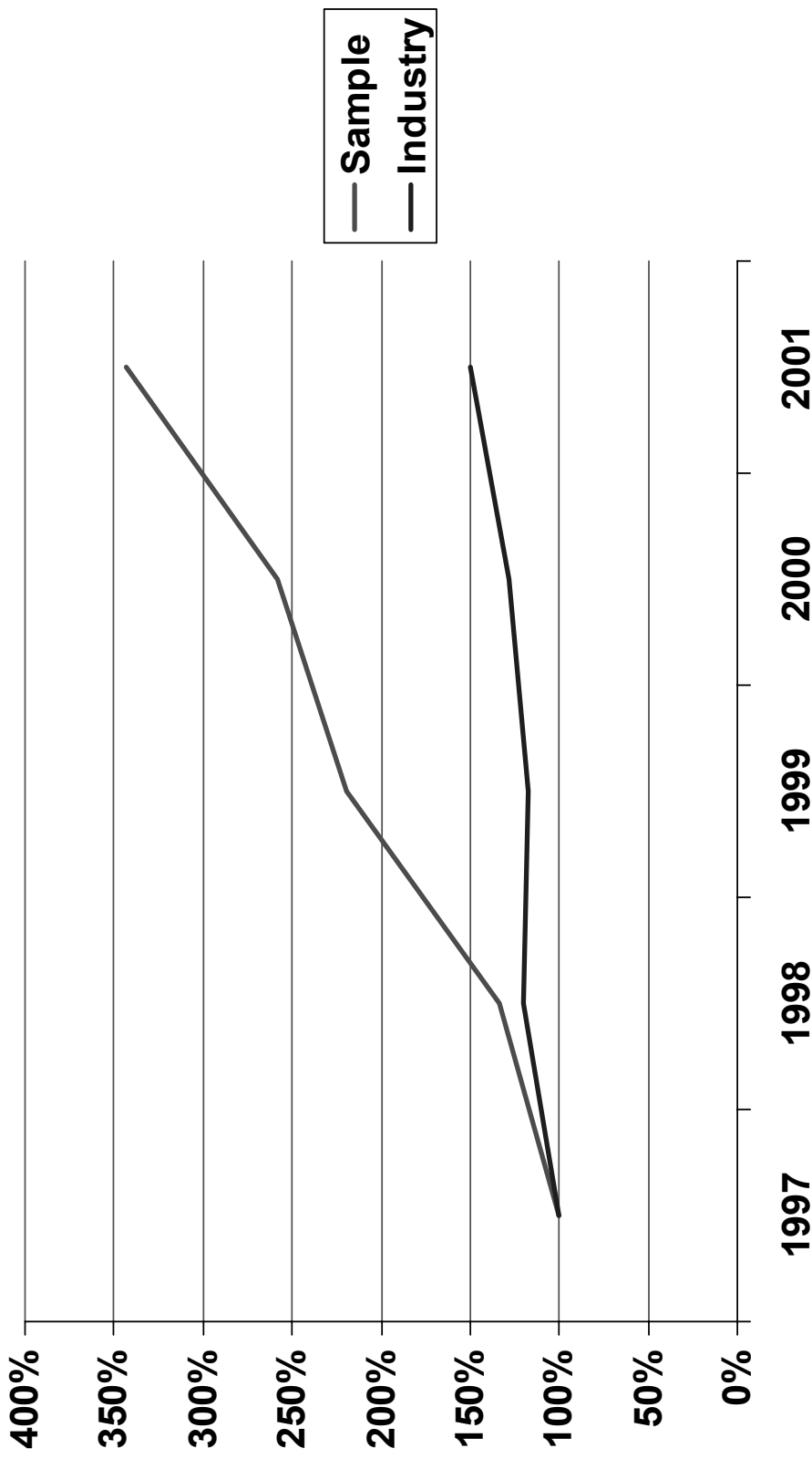
*Values in billions\$

Critical Indicators of Competitiveness

	Software	Industry
R&D / Sales (%)	8%	
VA / Employee (10^3 R\$)	97	26
Average Salary (10^3 R\$/Year)	56	10.5
Growth 1995-2000 (%)	350%	11%

Objective: Understand Patterns of Growth

Investigate Patterns of Leading Firms – Sample of 56



The Curse of the Domestic Market

- **Fast Growth of Domestic Demand**
 - Products and Services
- **Large Captive Markets**
 - Number of successful firms are spin-offs from existing players
 - Culture of customization and limited market aggressiveness
 - Legacy of large government driven economy
 - Government has huge software units (25% of national IT investment)
 - Some (state owned) sectors have substantial internal development effort
 - Hardware firms sold – foreigners use their own (external) technology
- **Jump to Foreign Solutions**
 - Backlash from import restrictions, neglecting local capabilities
 - Valid for firms and government
 - Lack of strong policies to support local industry
- **High Interest Rates**
 - Difficult and expensive to borrow
 - Growth based on internal financing... slow pace

The Effects of the Curse

- **Specialization Bias**
 - Diversified activities for growing regional market
 - Not specialized work for whole contry
 - Except São Paulo
 - High experimentation with software products
- **Poor Institutions**
 - No voice of the industry (2 major associations)
 - Limited cooperation between key players
 - Absence of a structured development policy
 - e.g. Export ‘taxes’
- **Small National Firms**
 - Difficult to compete with foreign firms on product market
 - e.g. ERP software
 - Difficult to compete in international market... in services

LEAD COMPANIES IN BRAZIL

Company	Sales	Origin	Company	Sales	Origin
Microsoft – SP	362,994	US	Rosch	28,401	D
Computer Assoc	260,000	US	Sybase	17,346	US
Oracle Brazil	182,842	US	Eversystems	15,405	BR
SAP Brazil	124,039	D	BMS	15,002	BR
Consist	77,600	US	Digitro	14,944	BR
Microsig	72,910	BR	Logocenter	14,915	BR
CPQD	64,135	BR	Adobe	12,500	US
Scopus	43,939	BR	Baan	12,000	UK
Datasul	37,561	BR	Network Ass	10,610	US
Novell	25,500	US	ATT/PS	8,581	US
DBA	56,030	BR	Modulo	8,410	BR
RM Sistemas	23,963	BR	Cyclades	6,842	BR
JD Edwards	21,850	US	Sispro	5,441	BR
Symantec	21,300	US	Cetil	5,283	BR
PeopleSoft	19,459	US	TSL	5,281	BR

Values in thousands of USD

LEAD COMPANIES IN BRAZIL and INDIA

<i>Brazil</i>			<i>India</i>		
Company	Sales	Origin	Company	Sales	Origin
Microsoft – SP	362,994	US	TCS	851,998	IN
Computer Assoc	260,000	US	Infosys	560,173	IN
Oracle Brazil	182,842	US	Wipro	504,221	IN
SAP Brazil	124,039	D	Satyam	373,668	IN
Consist	77,600	US	HCL Tech	289,631	IN
Microsiga	72,910	BR	Patni	160,614	IN
CPQD	64,135	BR	Silverline	132,309	IN
Scopus	43,939	BR	Mahindra BT	118,705	JV
Datasul	37,561	BR	Pentasoft	100,932	IN
Novell	25,500	US	HCL Perot	98,518	JV
DBA	56,030	BR	Mascot	88,425	IN
RM Sistemas	23,963	BR	NIIT	87,767	IN
JD Edwards	21,850	US	I-Flex	86,012	US
Symantec	21,300	US	Mphasis	68,678	IN
PeopleSoft	19,459	US	Mascon	67,361	IN

Values in thousands of USD

Nature of the Leading Firms

Main Revenue Source	Share of Firms	Business Model	Share of Firms	Share of Revenue
Products	58%	Embedded/ Component	34%	13%
		Customizable Product	20%	10%
Services	42%	High Value Services	35%	62%
		Low Value Services	7%	14%

Sample: 56 Firms¹⁷

The Promise of the Domestic Market

- **The existence of Lead Sectors**
 - Banking
 - Telecom
 - e-Government
 - Niche Startups
- **Mechanisms to discipline competence creation**
 - Venture Capital
 - Public ‘knowledgeable Capital

The Banking Sector

- **Internationalized and Competitive**
 - Traditionally high operational efficiency due to market volatility
 - Industry with second largest influx of FDI since 1995
 - High productivity improvements since liberalization
 - Domestic banks have kept market dominance
 - Recent adoption of Brazilian Payment System
- **Large investment in IT**
 - Accounts for 30% of all Brazilian IT investment
- **Important Market for Software companies**
 - Foreign: IBM, Oracle, SAP
 - Local Large: Scopus, DBA
 - Local Small Specialized: Software Design, Mintter

The Brazilian Payment System - SPB

- **What is the SPB?**
 - IT system that allows immediate transaction clearing
 - Payment only complete if financial institution has liquidity
 - Releases Central Bank from daily credit insurance role
 - Increases overall system reliability and transparency
 - Enacted in 1999-2001
- **Relevant IT/Software project**
 - Overall cost for the banking system: USD 800 Million
 - About 170 banks were involved
 - Microsoft considered the SPB to be the most important Banking IT project in Latin America
- **Fierce bidding by multiple national and foreign firms**

Leading Firms in SPB Development

Firm	Origin	Foreign Partner	N° Clients	Lead Clients
Software Design	Brazil	-	30+	UBS Warburg, BancoBI, Banco Schahin, Bank of America, JP Morgan, Lloyds Bank, Société Générale, UBS Warburg
Mintter	Brazil	Microsoft	18	Itaú, ABN Amro Bank, Safra
CRK	Brazil	Microsoft	17	HSBC, Mercantil do Brasil, Alfa, ING
Unysis	US	-	8	Bradesco, Unibanco, Bank Boston, Mercantil de São Paulo, Sudameris, Bicbanco, Banese, 2 Largest Clearing Houses
Linkware	Brazil	Computer Associates	12	Pine Bank
Gtronics	Dutch	-	?	Citibank

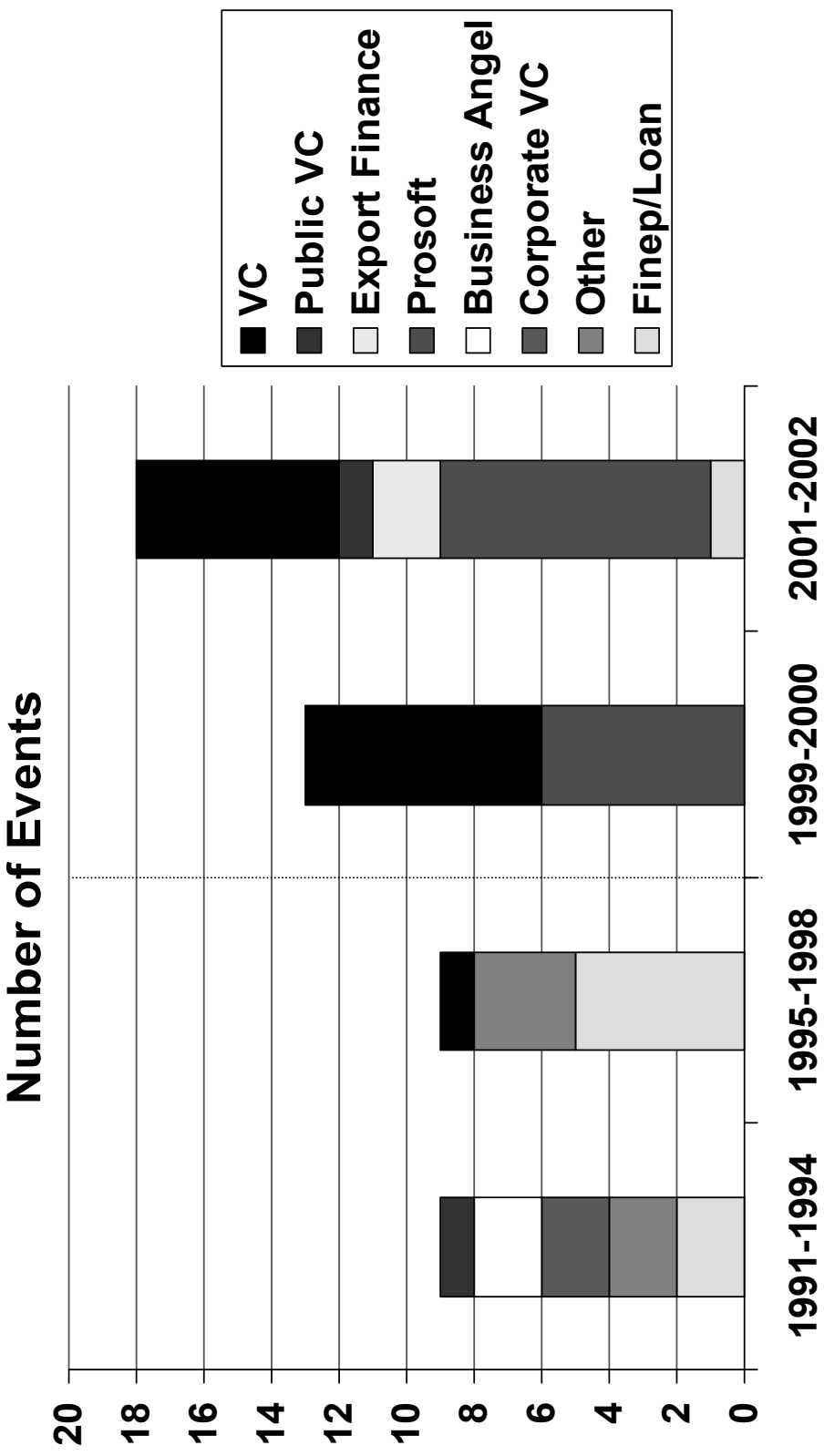
Examples of Other Lead Sectors

- **Telecom**
 - Spends 11% of Sales on R&D
 - Large Research Centers
 - Ericsson has 500 full time researchers
 - Local MNC have World Competence Centers for Product Areas
 - E.g. Siemens: Low end PBXs (software is 50% of development)
 - Strong Local R&D Activity – Heritage of Autarky
 - CPqD/Tropico: One of Leading Digital PBXs sold in South America (including to Telefonica)
- **e-Government**
 - Leading country in electronic voting - 90 million votes in Lula election
 - Over 95% of personal income tax delivered electronically
 - Experimentation with free software
 - 11 cities have laws giving preference to linux based software
- **Start-ups in Niches – Entrepreneurial Ability**
 - CESAR was one of the 5 winners of Asia Java Mobile Challenge
 - Developer in Connectiva firm is world maintainer of the Linux Kernel
 - Brazil considered country in top 5 of Global Entrepreneurship

Structuring Competencies

- **Strong International Market Competition**
 - Banking: SPB Example
 - Telecom: Mostly MNCs
 - ERP: SAP & Others present
 - Services: IBM, EDS, Accenture
 - Products: Microsoft, ...
- **Emergence of Disciplining Mechanisms**
 - Establishment of a Venture Capital Market
 - Creation of Government Funding Programmes

Growth of External Financing

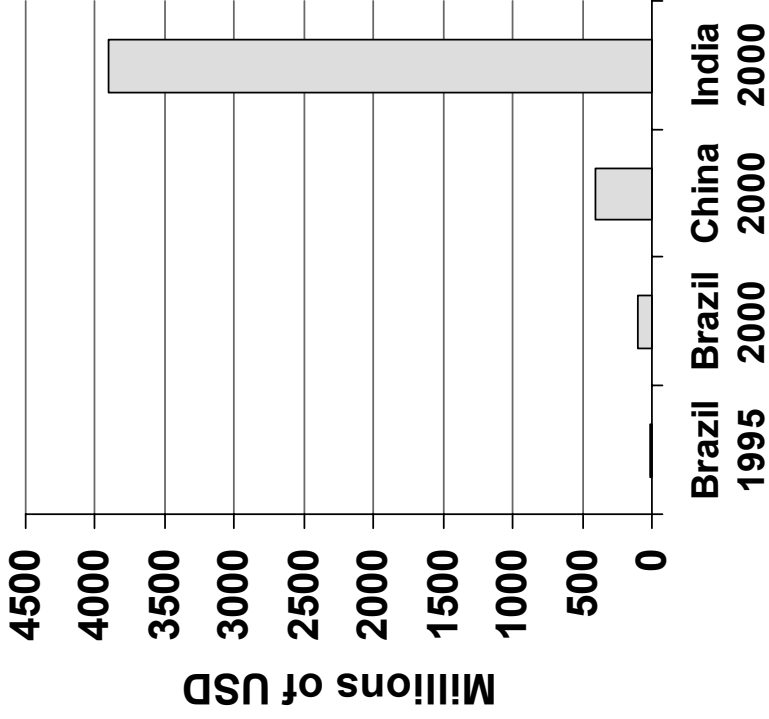


The Effects of External Financing

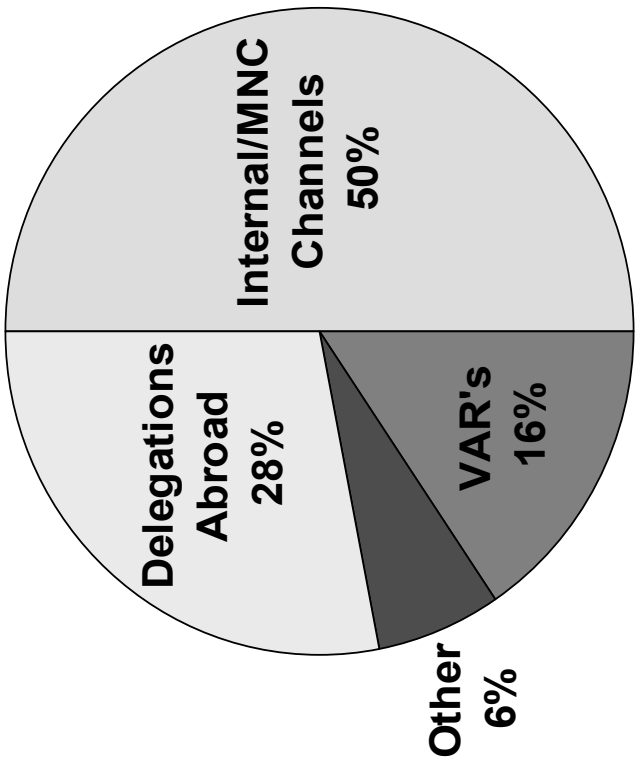
- **Definition of a Clear Business Model**
 - Preparation of Detailed Business Plans
 - Work with Outside Consultants
 - Positive Impact of both Private and Public VC
- **Restructuring of the Management Structure**
 - Hiring of Professional Managers
 - Restructuring of Management Responsibilities
- **An Example of a Lead Firm: Modulo**
 - One of the top 30 Brazilian Firms
 - Got 2 rounds of VC financing from 1997 to 2001
 - From security software development to security component
 - Hired former CEO of American Express Latin America
 - Files Reports according to US GAAP rules

Going Abroad

Software Exports



Export Strategy



Summary of Brazilian Observations

- **Alternative paths to the Export/US path**
 - Rely on Lead Client Sectors
 - Develop mechanisms that induce competence structuring
- **Recognize pitfalls created by domestic orientation**
 - Anti-specialization bias
 - Limits to growth...
- **Important Challenges Remain**
 - Have not succeeded the test of internationalization
 - Leaders in vertical segments are entering in higher level segments more populated with large international suppliers
- **The yet untapped opportunity**
 - Offshore services... the devaluation of real made Brazil Competitive

Policy Recommendations for Brazil

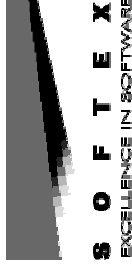
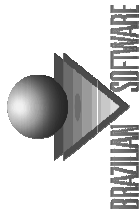
- **Recognize difference between Software**
 - Products
 - Services
- **Develop Integrated Financing Policies that**
 - Strengthens and expands the Venture Capital market
 - Induce firm growth (in particular through M&A)
 - Support internationalization of lead firms
- **Leverage Government Buying Power**
 - Reduce internal competencies – spin-off state firms
 - Establish pro-active procurement policies
- **Foster cultural evolution**
 - Promote cooperation
 - Foster institutional support for the industry – industry identity
- **Restructure Tax system**

India – China – Brazil – Considerations

	Beginnings	Sector	Differentiators	Barriers
India	<ul style="list-style-type: none"> • Earliest Firms 20-30 years old • MNCs 	<ul style="list-style-type: none"> • SW service export 	<ul style="list-style-type: none"> • Deep Labor Pool • English • SW Process • Global Links 	<ul style="list-style-type: none"> • Wage Pressure • Domain Knowledge
China	<ul style="list-style-type: none"> • Young SW firms • Some research and institute spin-offs 	<ul style="list-style-type: none"> • SW Products • HW Tech Services 	<ul style="list-style-type: none"> • Programming Talent • Government Action • Strong Domestic market 	<ul style="list-style-type: none"> • Process Capability • Small Firms • Open Market Experience
Brazil	<ul style="list-style-type: none"> • Hardware legacy • Rebirth in 90s • Lots of Startups 	<ul style="list-style-type: none"> • SW Products • Vertical SW Services 	<ul style="list-style-type: none"> • Strong Domestic market • Strong Client Sectors 	<ul style="list-style-type: none"> • Small Firms • International Visibility

Brazilian Software: On a Path Towards a World-Class Industry?

Research Support:



Financial Support:

