AN ANALYSIS OF THE ENVIRONMENTAL INFORMATION IN INTERNATIONAL COMPANIES ACCORDING TO THE NEW GRI STANDARDS

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CONTEXTUALIZAÇÃO

- Importância cada vez maior dos aspectos ambientais:
  - *Empresas passaram a ser criticadas pelos seus impactos socioambientais ao invés de serem valorizadas por seus resultados tecnológicos e econômicos*
  - *Necessidade de fornecer dados para acionistas*

- Resultados:
  - *Redução dos impactos: Melhorar imagem e evitar conflitos com acionistas*
  - *Maior divulgação dessas informações*

OBJETIVO

- Criação de um índice ambiental: Análise da qualidade das informações fornecidas
- Incentivar empresas a divulgarem seus dados
- Avaliar se as informações estão coerentes com a GRI (Global Reporting Initiative)
- Base de dados: empresa Thomson Reuters Eikon
  - *Importante base de dados a nível internacional*

Table 1
Sample descriptive statistics.

Panel A. Number of companies by region		
Region	**Code**	**Number companies**
Latin America	1	174
Europe	2	413
Africa	3	55
Asia	4	547
Oceania	5	77
Middle East	6	190
Russian Federation	7	27
Canada	8	450
USA	9	3481
Panel B. Number of companies by sector		
Sector	**Code**	**Number companies**
Automobiles & Components	1	55
Capital Goods	2	434
Commercial & Professional Services	3	150
Consumer Durables & Apparel	4	166
Consumer Services	5	192
Diversified Financials	6	42
Energy	7	792
Food & Staples Retailing	8	45
Food, Beverage & Tobacco	9	255
Health Care Equipment & Services	10	286
Household & Personal Products	11	82
Materials	12	799
Media	13	135
Pharmaceuticals, Biotechnology & Life Sciences	14	445
Real State	15	14
Retailing	16	173
Semiconductors & Semiconductor Equipment	17	148
Software & Services	18	477
Technology Hardware & Equipment	19	294
Telecommunication Services	20	101
Transportation	21	157
Utilities	22	172

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Amostra: 5414 empresas, 128 variáveis

Table 2
Environmental indicators.

Indicator	Code	Indicator	Code
Policy Energy Efficiency	V01	Carbon Offsets/Credits	V40
Resource Reduction Policy	V02	Emissions Trading	V43
Policy Water Efficiency	V03	Climate Change Commercial Risks Opportunities	V44
Policy Sustainable Packaging	V04	NOx and SOx Emissions Reduction	V45
Policy Environmental Supply Chain	V05	NOx Emissions	V46
Environment Management Team	V07	SOx Emissions	V47
Environment Management Training	V08	VOC Emissions Reduction	V49
Environmental Materials Sourcing	V09	Particulate Matter Emissions Reduction	V50
Toxic Chemicals Reduction	V10	VOC Emissions	V51
Energy Use	V11	Total Waste	V52
Renewable Energy Use	V12	Waste Recycling Ratio	V53
Renewable Energy Supply	V13	Hazardous Waste	V54
Energy Use Total	V14	Waste Reduction Total	V55
Energy Purchased Direct	V15	e-Waste Reduction	V56
Energy Produced Direct	V16	Discharge into Water System	V57
Indirect Energy Use	V17	Water Discharged	V58
Electricity Purchased	V18	Water Pollutant Emissions	V59
Renewable Energy Purchased	V20	ISO 14000 or EMS	V60
Renewable Energy Produced	V21	EMS Certified Percent	V61
Renewable Energy Use	V22	Environmental Restoration Initiatives	V62
Water Use	V23	Environmental Expenditures	V64
Water Withdrawal Total	V24	Environmental Provisions	V65
Fresh Water Withdrawal Total	V25	Environmental Investments Initiatives	V66
Water Recycled	V26	Environmental Partnerships	V68
Environmental Supply Chain Management	V27	Environmental Products	V69
Environmental Supply Chain Monitoring	V28	Eco-Designs Product	V70
Env Supply Chain Partnership Termination	V29	Noise Reduction	V73
Land Environmental Impact Reduction	V30	Hybrid Vehicles	V74
Environmental Controversies	V31	Equator Principles	V76
Policy Emissions	V32	Environmental Asset under Management	V77
Biodiversity Impact Reduction	V34	Product Environmental Responsible Use	V78
Greenhouse Gas Emissions	V35	Agrochemical Products	V79
CO_2 Equivalents Emission Total	V36	Renewable/Clean Energy Products	V80
CO_2 Equivalents Emission Direct	V37	Water Technologies	V81
CO_2 Equivalents Emission Indirect	V38	Sustainable Building Products	V82
CO_2 Equivalent Indirect Emissions, Scope 3	V39		

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Problemas

- Variáveis categóricas
- Ausência de dados
- Caráter positivo e negativo

Soluções

- Técnica estatística: CATPCA
- CATPCA
- Atribuição de valores: -1, 0 e 1

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Algoritmo baseado em 2 técnicas estatísticas: CATPCA e PTA

CATPCA: Obtenção da matriz numérica

PTA: Extração de um vetor

Vetor (índices): combinação linear das variáveis e seus pesos

RESULTADOS

Table 3
Variables in each group (c – categorical, n – negative) with their weights for the proposed index.

Variables	n	c	Weight
Group 1: Negative variables			
V24: Water Withdrawal Total	x		0.0058
V25: Fresh Water Withdrawal Total	x		0.0055
V36: CO_2 Equivalents Emission Total	x		0.0054
V18: Electricity Purchased	x		0.0054
V38: CO_2 Equivalents Emission Indirect	x		0.0051
V37: CO_2 Equivalents Emission Direct	x		0.0044
V58: Water Discharged	x		0.0038
V47: SOx Emissions	x		0.0031
V39: CO_2 Equivalent Indirect Emissions, Scope 3	x		0.0023
Total			0.0407
Group 2: Low contribution variables			
V52: Total Waste	x		0.0043
V14: Energy Use Total	x		0.0041
V15: Energy Purchased Direct	x		0.0039
V53: Waste Recycling Ratio			0.0034
V64: Environmental Expenditures	x		0.0033
V16: Energy Produced Direct			0.0030
V51: VOC Emissions	x		0.0027
V12: Renewable Energy Use			0.0026
V26: Water Recycled			0.0023
V54: Hazardous Waste	x		0.0023
V46: NOx Emissions	x		0.0020
V40: Carbon Offsets/Credits	x		0.0019
V17: Indirect Energy Use	x		0.0018
V59: Water Pollutant Emissions	x		0.0017
V21: Renewable Energy Produced			0.0016
V57: Discharge into Water System	x		0.0002
V13: Renewable Energy Supply			0.0001
V35: Greenhouse Gas Emissions	x		0.0000
V11: Energy Use	x		0.0000
V23: Water Use	x		0.0000
Total			0.041
Group 3: Other variables			
V02: Resource Reduction Policy		x	0.0131
V31: Environmental Controversies	x	x	0.0129

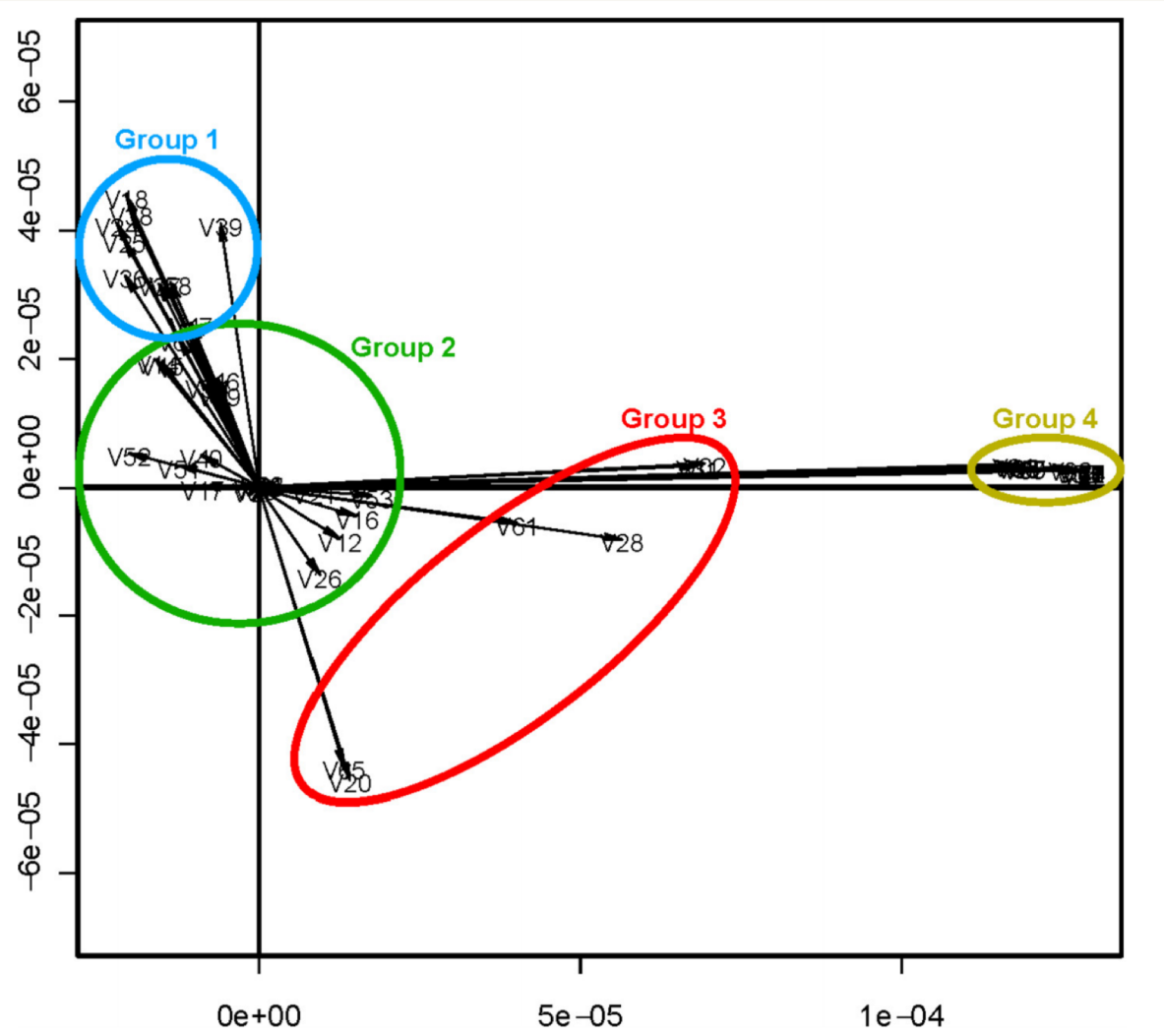

Fig. 1. Plot with the interstructure for the variables.

RESULTADOS

- Grupo 1: Variáveis negativas
- Grupo 2: Variáveis de baixa contribuição
- Grupo 3: Outras
- Grupo 4: Variáveis categóricas

Table 5
Environmental indicators for each series GRI standard.

GRI indicators	Code	Environmental indicators
Materials	X301	V02, V04, V09, V40, V62, V69, V70, V73, V74, V78, V79, V80, V82
Energy	X302	V01, V11, V12, V13, V14, V15, V16, V17, V18, V20, V21, V22
Water	X303	V03, V23, V24, V25, V26, V57, V58, V59, V81
Biodiversity	X304	V34
Emissions	X305	V10, V32, V35, V36, V37, V38, V39, V43, V45, V46, V47, V49, V50, V51
Effluents and waste	X306	V52, V53, V54, V55, V56
Environmental compliance	X307	V07, V08, V30, V31, V44, V60, V61, V64, V66, V76, V77
Supplier environmental assessment	X308	V05, V27, V28, V29, V65, V68

RESULTADOS

Indicadores GRI e as variáveis analisadas

RESULTADOS

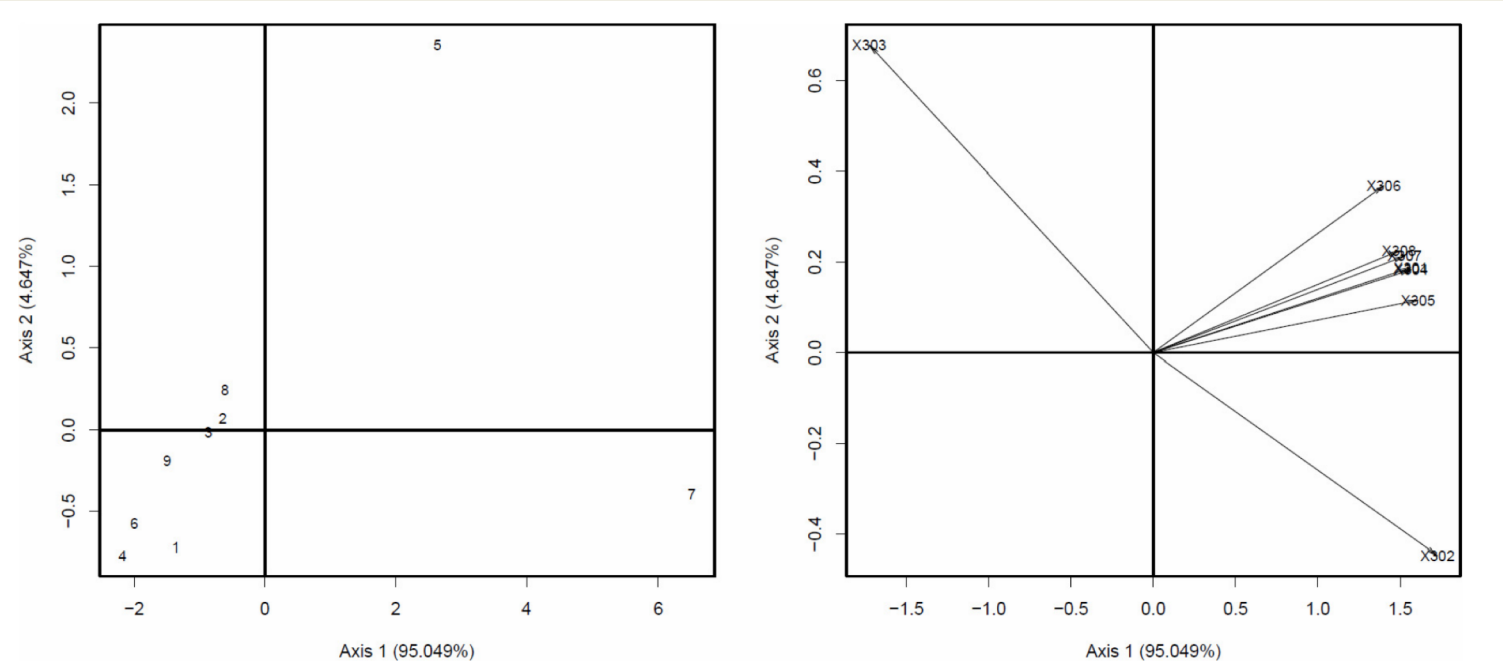

Fig. 2. (Left) Geographical regions (codes from Table 1) vs (right) GRI indicators (codes from Table 5).

RESULTADOS

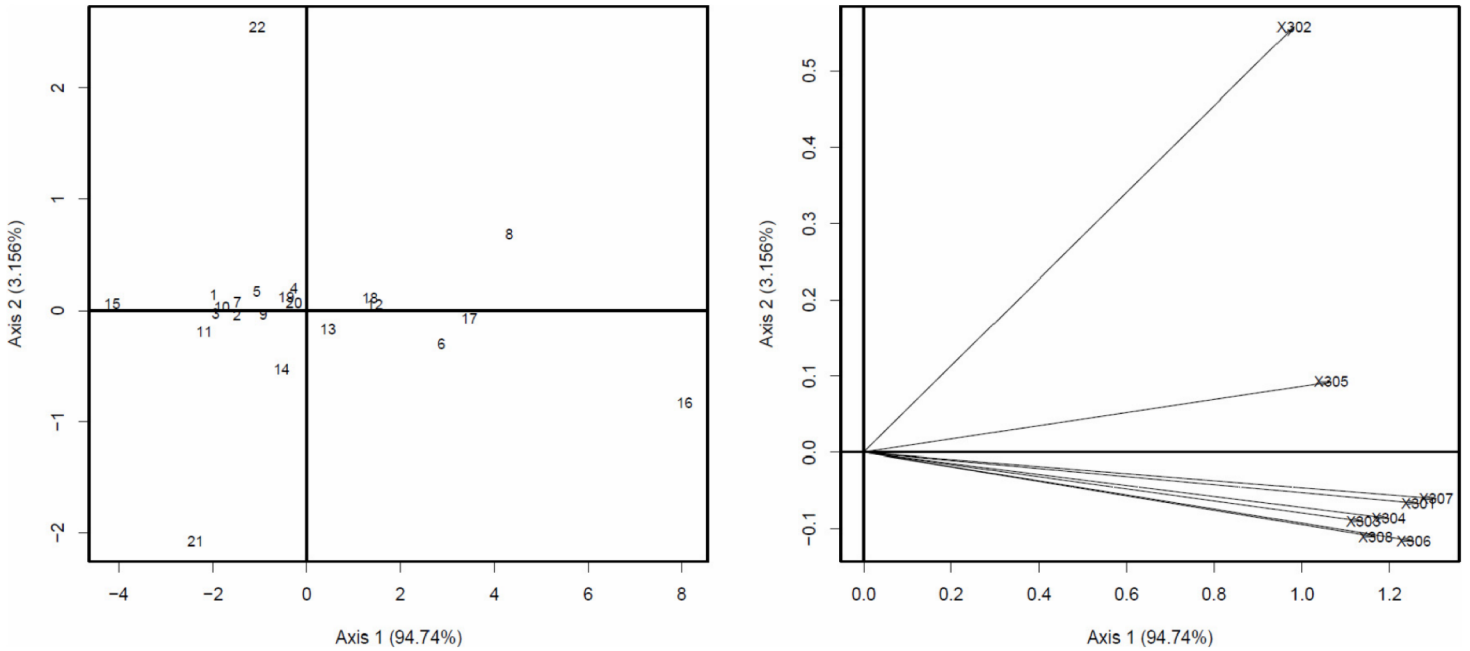

Fig. 3. (Left) Industries (codes from Table 1) vs (right) GRI indicators (codes from Table 5).

CONCLUSÕES

- O estudo conseguiu abordar os setores e regiões que prestam mais atenção aos índices do GRI
- Não entra no mérito de quais indicadores as empresas priorizam
- Instrumento para fortalecer as legislações ambientais
- Abre espaço para futuros estudos sobre comparações dos índices ao longo do tempo