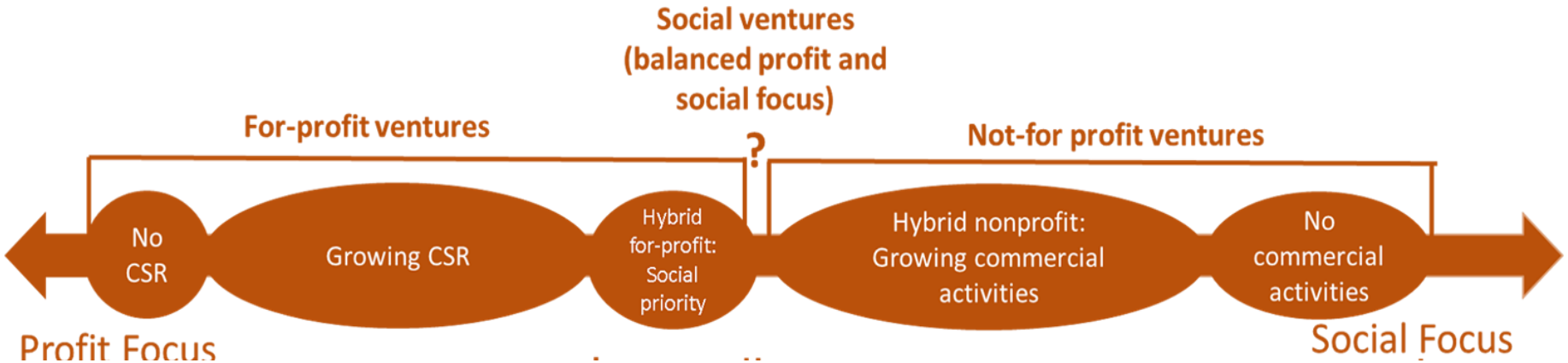
STEVENS INSTITUTE of TECHNOLOGY
THE INNOVATION UNIVERSITY

BIA 652 Multivariate Data Analysis I

POSITIONING SOCIAL ENTREPRENEURSHIP BETWEEN TRADITIONAL AND NONPROFIT ENTREPRENEURSHIP

Christina Polychroni
Vaibhav Desai
Sarvesh Thakur
Dhanashri Parkar

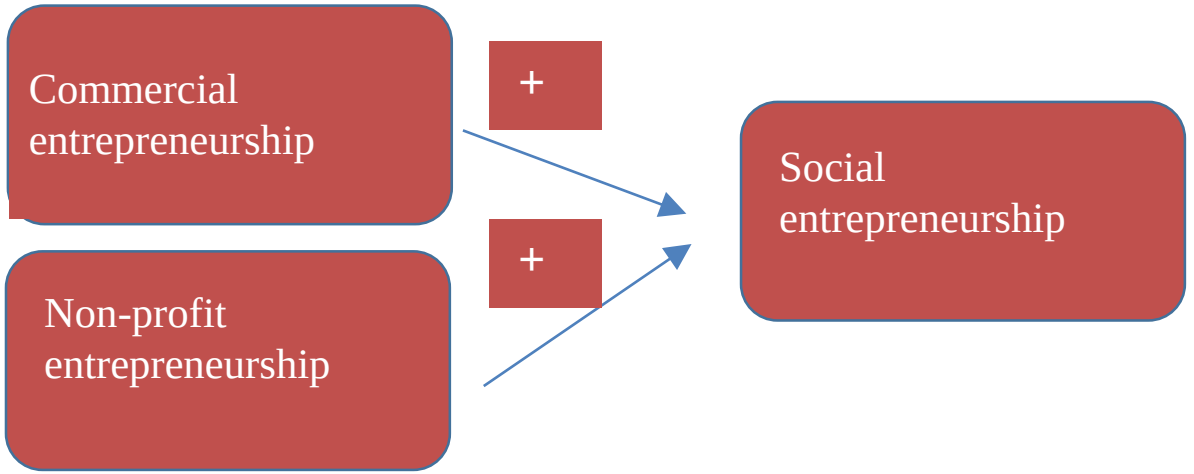
What is social entrepreneurship?



Literature presents a continuum that expands from a profit focus to a social focus. We argue that ventures representing the social entrepreneurship territory are true to their description as social ventures when they showcase **both social and entrepreneurial characteristics.**

Research Question: Is Social Entrepreneurship impacted by the rate of commercial entrepreneurship (profit focus) and by the rate of non-profit entrepreneurship (social focus) and what is the nature and extent of this impact?

Our theoretical model



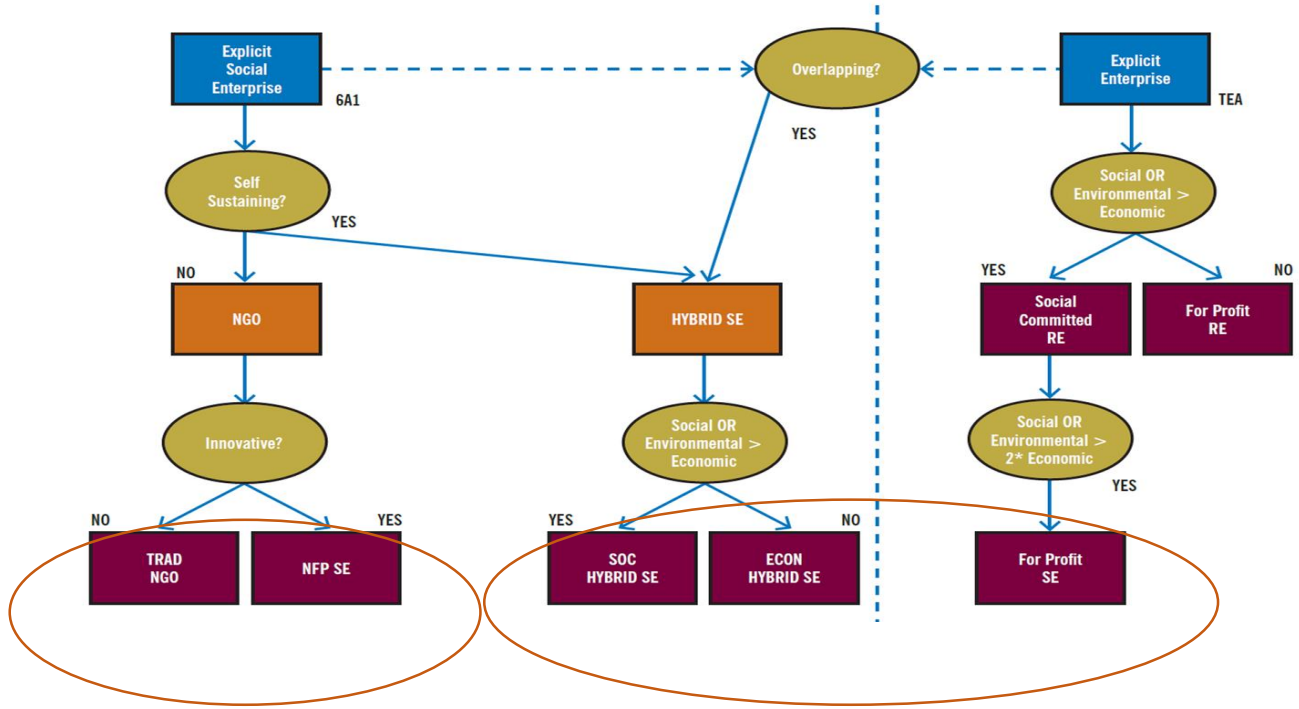
H1: Social Entrepreneurship is positively impacted by the rate of commercial entrepreneurship in a market.

H2: Social Entrepreneurship is positively impacted by the rate of non-profit entrepreneurship in a market.

Data sets and variables

Data set used: Global Entrepreneurship Monitor (GEM) in 2009, including a unique dataset on social entrepreneurship covering more than 114,000 individuals in 47 countries around the world, as well as the adult population and national expert studies available for those countries.

Figure 2—Basic Methodology to Identify Individuals Involved in Social Entrepreneurship



Independent Variable 1: **Commercial Entrepreneurship**, consisting of new and established business ownership rate

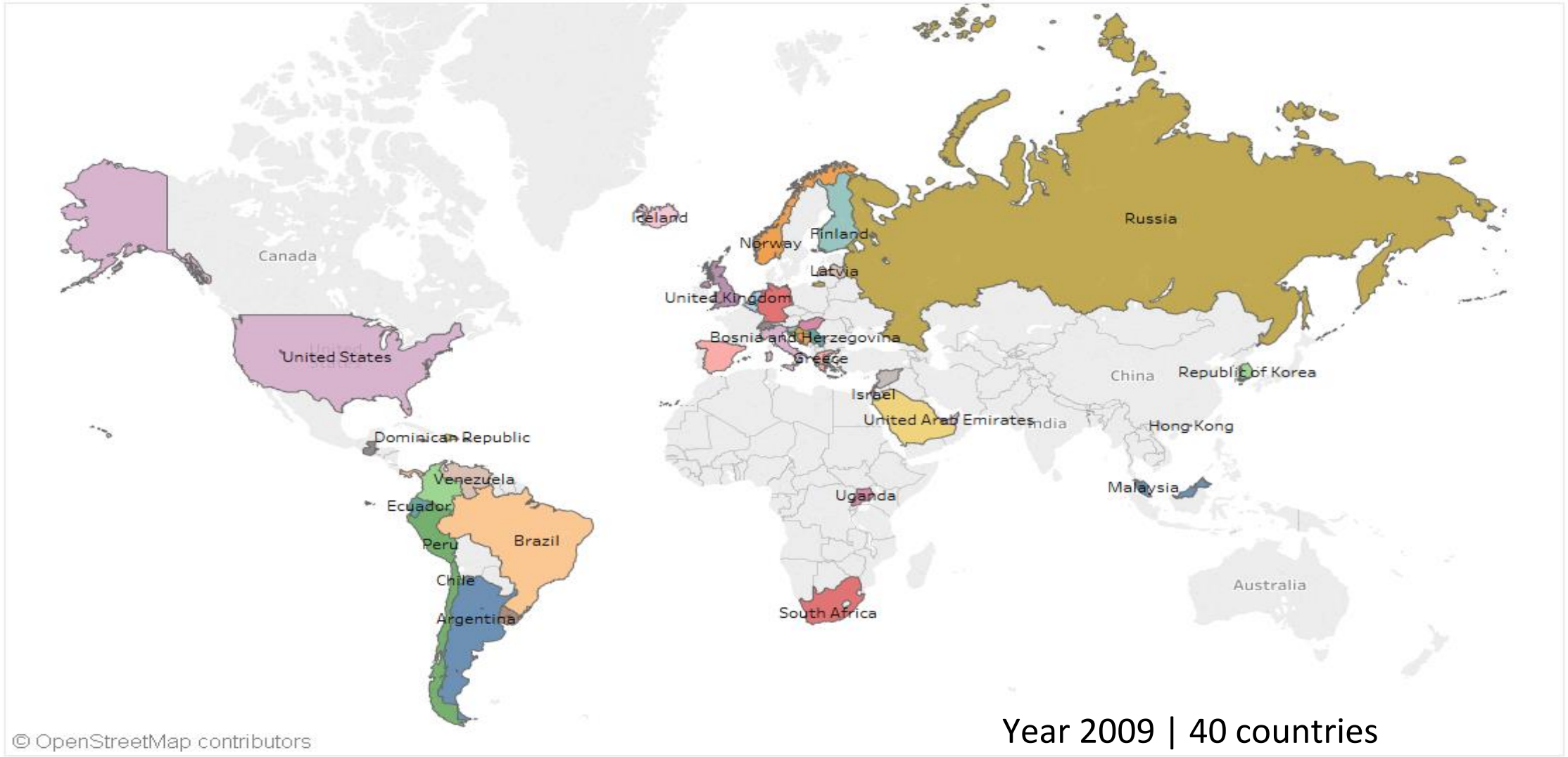
Independent Variable 2: **Non-profit Entrepreneurship**

Dependent Variable: **Social Entrepreneurship**

Control Variables on entrepreneurship:

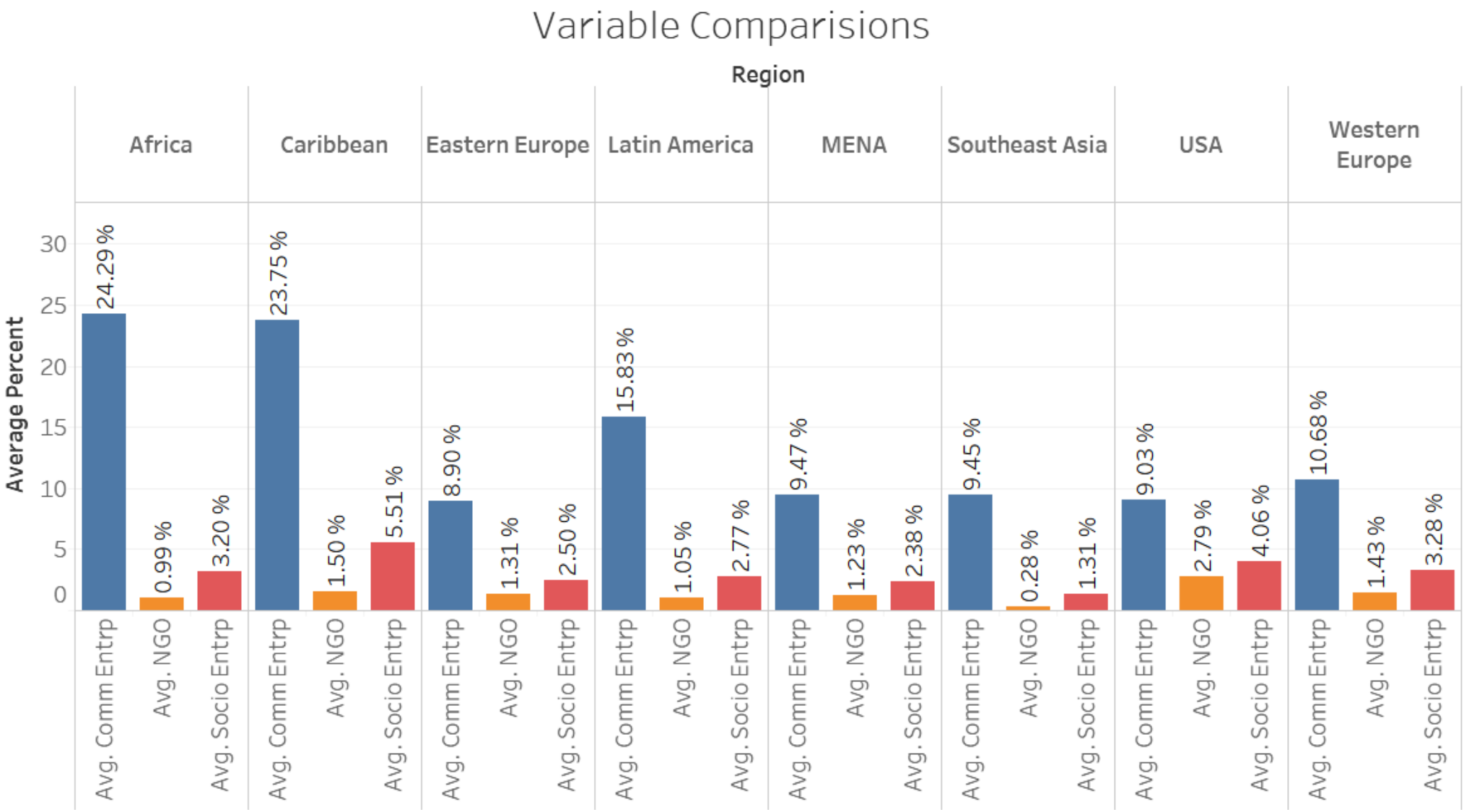
1) financial support
2) government policies
3) taxes
4) government programs
5) basic school entrepreneurship education
6) post-school entrepreneurship education
7) research and development
8) commercial and professional infrastructure
9) internal market dynamics
10) internal market openness
11) ease of access to physical resources
12) cultural and social norms

Social entrepreneurship Report: GEM Consortium

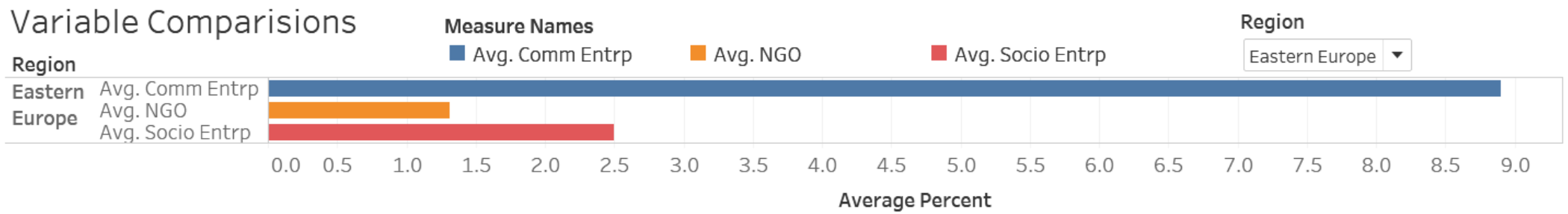


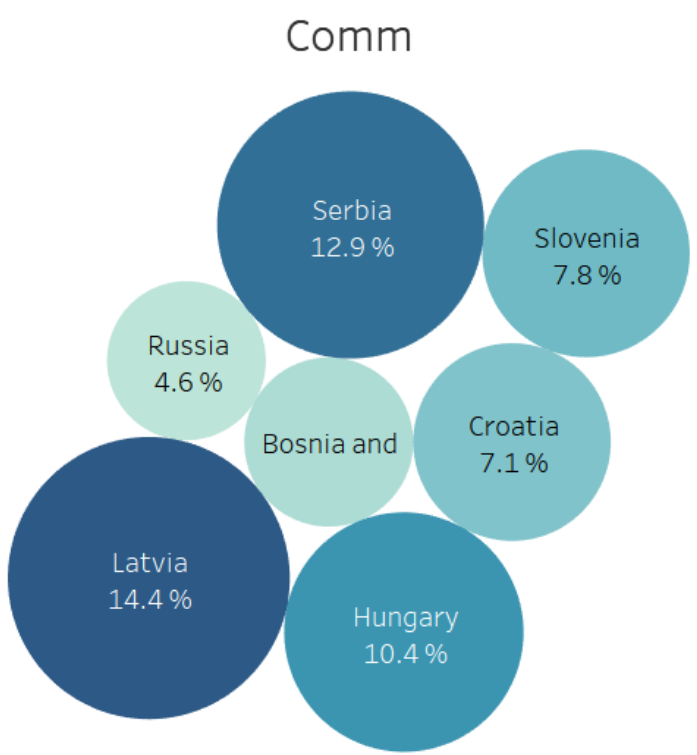
Year 2009 | 40 countries

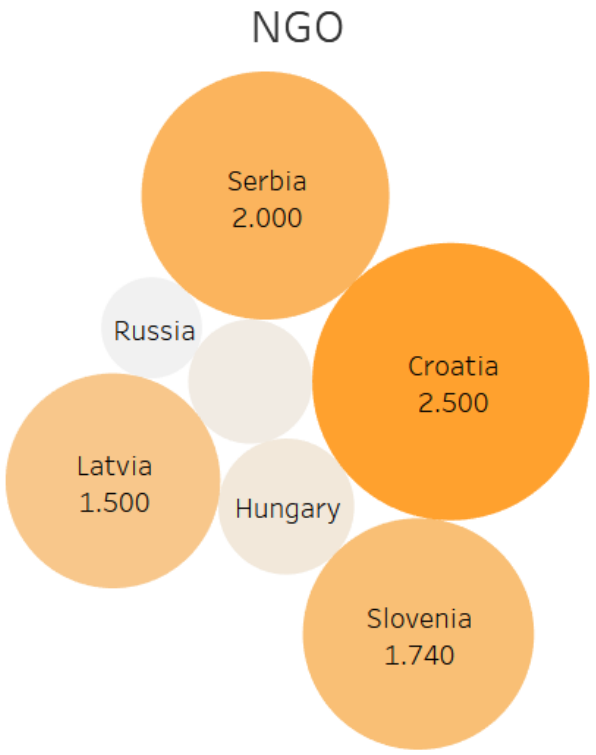
Social entrepreneurship Report: GEM Consortium

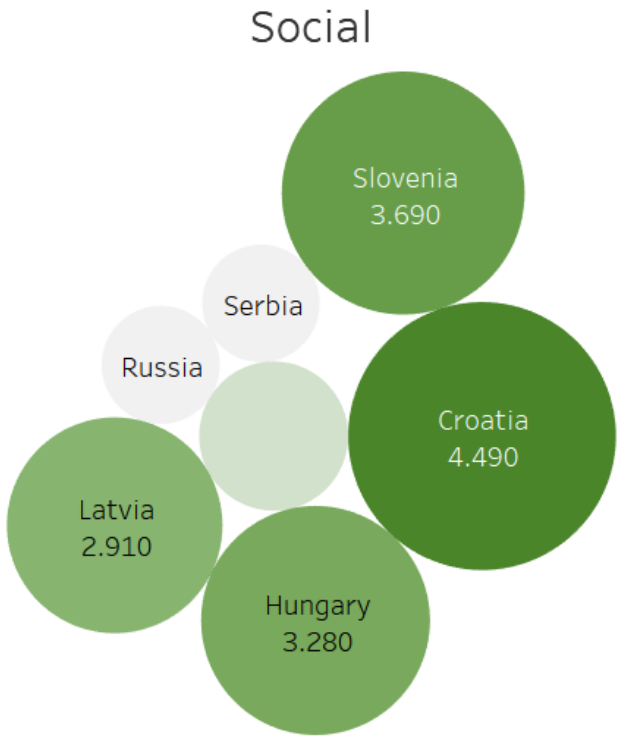


Breakdown by Region









Results

Step 1Model: NGO IV and commercial IV on social entrepreneurship

Regression of Socio_Entrp vs Comm_Entrp_IV NGO_IV

The REG Procedure
Model: MODEL1
Dependent Variable: Socio_Entrp

Number of Observations Read	40
Number of Observations Used	40

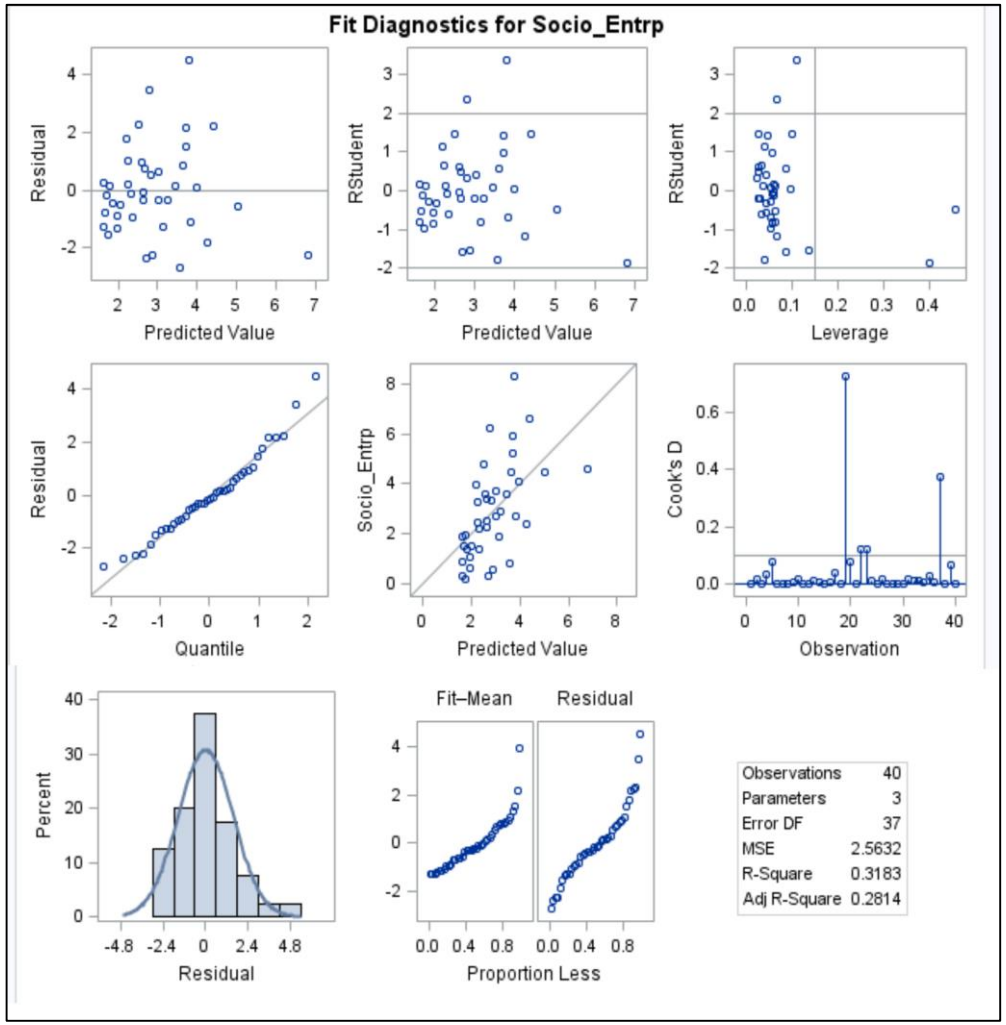
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	44.28058	22.14029	8.64	0.0008
Error	37	94.83880	2.56321		
Corrected Total	39	139.11938			

Root MSE	1.60100	R-Square	0.3183
Dependent Mean	2.90425	Adj R-Sq	0.2814
Coeff Var	55.12621		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1.11419	0.53733	2.07	0.0451
Comm_Entrp_IV	1	0.06076	0.03326	1.83	0.0758
NGO_IV	1	0.83133	0.24961	3.33	0.0020



Results

Introduction of Control variables

Pearson Correlation Coefficients, N = 40
Prob > |r| under H0: Rho=0

	Financing	Govt_support	Tax_bureaucracy	Gov_program	Basic_entrp_training	Post_entrp_training	RD	Comm_prof_infra	int_mark_dynamics	Int_markt_openness	Phy_serv_Infra	Cult_Social_norms
Financing	1											
Govt_support	0.5759 0.0001	1										
Tax_bureaucracy	0.43096 0.0055	0.53749 0.0003	1									
Gov_program	0.50502 0.0009	0.64758 <.0001	0.54462 0.0003	1								
Basic_entrp_training	0.44031 0.0045	0.31321 0.0491	0.36555 0.0204	0.38842 0.0133	1							
Post_entrp_training	0.16689 0.3034	0.07125 0.6622	0.30973 0.0518	0.29248 0.067	0.53974 0.0003	1						
RD	0.62537 <.0001	0.55777 0.0002	0.47245 0.0021	0.81034 <.0001	0.56434 0.0001	0.46838 0.0023	1					
Comm_prof_infra	0.55761 0.0002	0.21056 0.1922	0.50553 0.0009	0.39026 0.0128	0.65902 <.0001	0.44408 0.0041	0.61192 <.0001	1				
int_mark_dynamics	0.08394 0.6066	0.018 0.9122	0.02713 0.868	-0.13003 0.4239	0.10137 0.5337	-0.01029 0.9498	-0.10355 0.5249	-0.10777 0.508	1			
Int_markt_openness	0.60499 <.0001	0.48409 0.0016	0.60171 <.0001	0.54143 0.0003	0.39605 0.0114	0.28759 0.0719	0.59207 <.0001	0.60709 <.0001	-0.11495 0.48	1		
Phy_serv_Infra	0.52878 0.0005	0.38451 0.0143	0.78988 <.0001	0.63217 <.0001	0.39254 0.0122	0.35372 0.0251	0.64899 <.0001	0.55465 0.0002	-0.06442 0.6929	0.697 <.0001	1	
Cult_Social_norms	0.31518 0.0476	0.14571 0.3697	0.41122 0.0084	0.23247 0.1489	0.23952 0.1366	0.43157 0.0054	0.30286 0.0575	0.30443 0.0561	0.22388 0.1649	0.38585 0.0139	0.38576 0.014	1

Variable reduction using principal compnent method

The FACTOR Procedure
Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix: Total = 12 Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	5.71742466	4.32740965	0.4765	0.4765
2	1.39001501	0.21842898	0.1158	0.5923
3	1.17158602	0.24264087	0.0976	0.6899
4	0.92894516	0.18019429	0.0774	0.7673
5	0.74875086	0.16036591	0.0624	0.8297
6	0.58838495	0.15194058	0.0490	0.8788
7	0.43644437	0.12285497	0.0364	0.9151
8	0.31358940	0.02658800	0.0261	0.9413
9	0.28700140	0.06680380	0.0239	0.9652
10	0.22019760	0.09181862	0.0183	0.9835
11	0.12837898	0.05909738	0.0107	0.9942
12	0.06928159		0.0058	1.0000

Results

Component Retention, Grouping and naming them

Factor anaysis with 5 factors and varimax rotation

The FACTOR Procedure
Rotation Method: Varimax

Orthogonal Transformation Matrix

	1	2	3	4	5
1	0.56596	0.56694	0.52130	0.29345	-0.01995
2	-0.57674	0.07144	0.19128	0.66375	0.43026
3	0.19493	0.24033	-0.25048	-0.33729	0.85308
4	0.32998	-0.76739	0.46208	0.04532	0.29438
5	0.44742	-0.16381	-0.64451	0.59792	-0.00892

Rotated Factor Pattern

	Factor1	Factor2	Factor3	Factor4	Factor5
Financing	0.48446	0.32504	0.62530	-0.13615	0.18014
Govt_support	0.86986	0.19649	0.12714	-0.10886	0.11200
Tax_bureaucracy	0.37682	0.75986	0.17735	0.09725	0.01125
Gov_program	0.82731	0.29709	0.13624	0.23131	-0.16233
Basic_entrp_training	0.25622	0.00658	0.71671	0.48417	0.13063
Post_entrp_training	0.06656	0.19584	0.21387	0.88900	-0.01748
RD	0.67606	0.24932	0.43161	0.36375	-0.12482
Comm_prof_infra	0.07029	0.36407	0.82065	0.24242	-0.13876
int_mark_dynamics	-0.02340	-0.00788	0.00730	0.00339	0.94871
Int_markt_openness	0.32695	0.65410	0.47320	-0.01242	-0.13054
Phy_serv_Infra	0.36280	0.74453	0.29526	0.14442	-0.13537
Cult_Social_norms	-0.01706	0.67407	0.00321	0.42120	0.36562

Rotated Factor Pattern

	Factor1	Factor2	Factor3	Factor4	Factor5
Fianancing	0.48446	0.32504	**0.6253**	-0.1362	0.18014
Govt_support	**0.86986**	0.19649	0.12714	-0.1089	0.112
Tax_bureaucracy	0.37682	**0.75986**	0.17735	0.09725	0.01125
Gov_program	**0.82731**	0.29709	0.13624	0.23131	-0.1623
Basic_entrp_training	0.25622	0.00658	**0.71671**	0.48417	0.13063
Post_entrp_training	0.06656	0.19584	0.21387	**0.889**	-0.0175
RD	**0.67606**	0.24932	**0.43161**	0.36375	-0.1248
Comm_prof_infra	0.07029	0.36407	**0.82065**	0.24242	-0.1388
int_mark_dynamics	-0.0234	-0.0079	0.0073	0.00339	**0.94871**
Int_markt_openness	0.32695	**0.6541**	0.4732	-0.0124	-0.1305
Phy_serv_Infra	0.3628	**0.74453**	0.29526	0.14442	-0.1354
Cult_Social_norms	-0.0171	**0.67407**	0.00321	0.4212	0.36562

Factor1	Govt_support, Gov_program, RD	**Gov_RD_Support**
Factor2	Tax_bureaucracy, Int_markt_openness, Phy_serv_Infra, Cult_Social_norms	**Market infrastrucure**
Factor3	Financing, Basic_entrp_training, Comm_prof_infra	**Institutional Support**
Factor4	Post_entrp_training	**Post_entrp_training**
Factor5	int_mark_dynamics	**int_mark_dynamics**

Results

With the Principal components and the predictors NGO and Commercial IV

Model with the principal components, Comm_Entrp_IV, NGO_IV

The REG Procedure
Model: MODEL1
Dependent Variable: Socio_Entrp

Number of Observations Read	40
Number of Observations Used	40

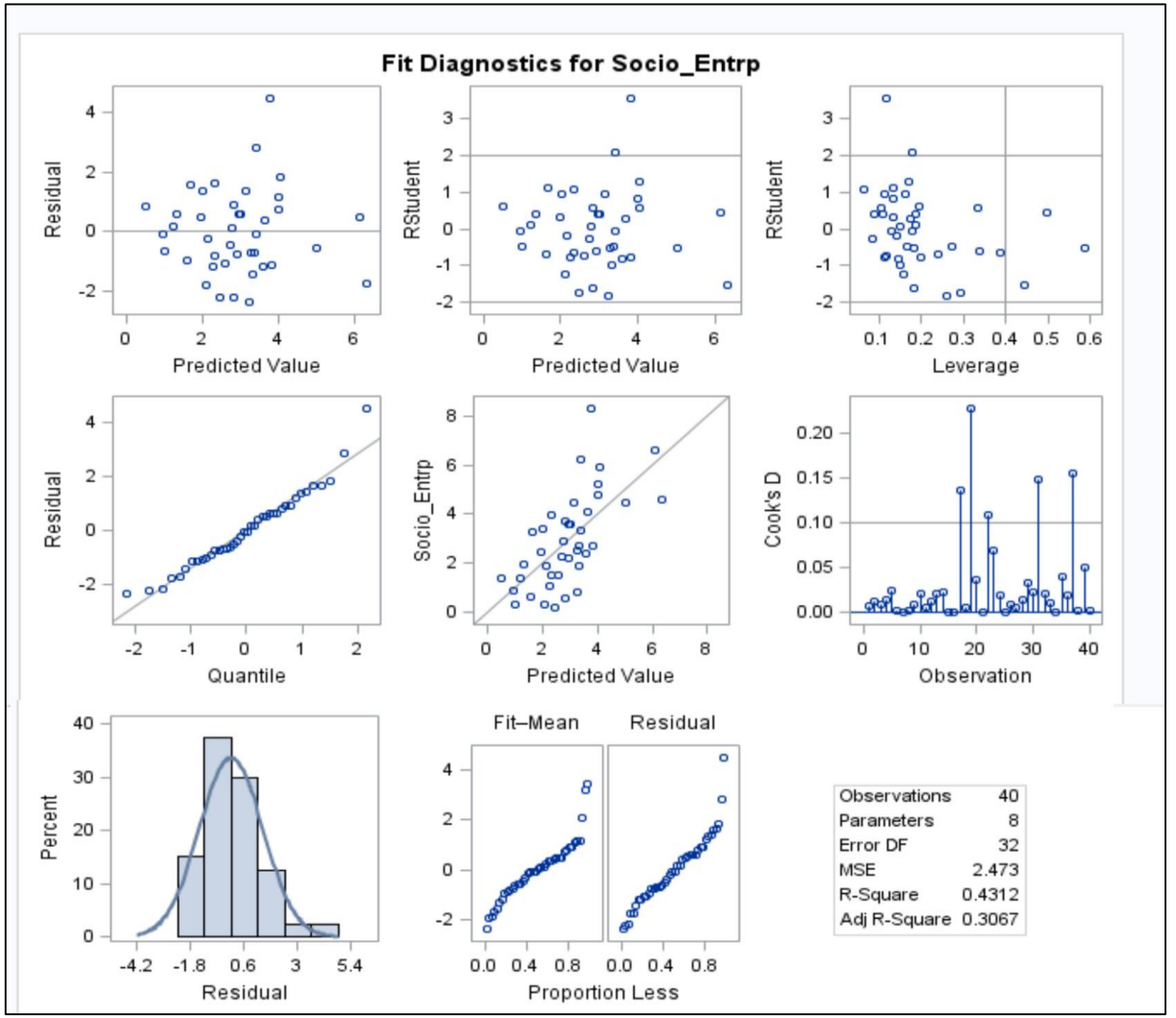
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	59.98236	8.56891	3.46	0.0071
Error	32	79.13702	2.47303		
Corrected Total	39	139.11938			

Root MSE	1.57259	R-Square	0.4312
Dependent Mean	2.90425	Adj R-Sq	0.3067
Coeff Var	54.14780		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	1.11714	0.56637	1.97	0.0572	0
NGO_IV	1	0.70975	0.25624	2.77	0.0093	1.13101
Comm_Entrp_IV	1	0.07220	0.03589	2.01	0.0527	1.24953
Gov_RD_Support	1	0.43424	0.25914	1.68	0.1035	1.05902
Market_infrastrucure	1	0.36776	0.25258	1.46	0.1551	1.00609
Institutional_Support	1	0.02011	0.26567	0.08	0.9401	1.11303
Post_entrp_training_Comp	1	0.30399	0.26620	1.14	0.2620	1.11752
int_mark_dynamics_comp	1	-0.07723	0.25320	-0.30	0.7623	1.01100



Discussion

On non-profit and commercial entrepreneurship positively influencing social entrepreneurship- can we show relatively which one affects more through SAS?