Technical Background Paper

The Social Market Economy as a Formula for Peace, Prosperity and Sustainability

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1. General Remarks on the Data

The final dataset consists of 165 observations. These are all the countries for which there was at least one observation available for GDP per capita and democracy (Polity 2 score), which I used to estimate missing observations. A third variable that needed at least one available observation to be included in the data set is "inflation." The variable "inflation" is not as easily estimated when unavailable as the other variables.

Some of the SME output proxies have missing observations, too. Because there are no appropriate correlates, I do not estimate the missing observations of the SME output variables in a regression but fill them with respective regional averages.

After obtaining a complete dataset, I apply natural log transformation to the variables whenever it improved the distributional characteristic towards greater normality. I then scale all input variables between 0 and 100 such that 0 is worst and 100 is best.

2. Data for the Social Market Economic Performance Index

Below Table 1 lists and describes the variables and provides sources.

Table 1: Input Variables for the Social Market Economic Performance Index

SME Input	Indicator	Definition	Source
State-Constitutional Principles			
Democracy	Polity 2	Index between -10 and +10 with negative scores indicating autocracies, scores between 1 and 6 describing anocracies, and scores of 7 and greater identifying democracies.	CSP (2018)
Subsidiarity	Fiscal Decentralization	Composite index of (1) taxation autonomy, (2) intergovernmental transfers, (3) borrowing, and (4) vertical gap.	Ivanyna & Shah (2014)
State-Political Principles			
Protection from Special Interest Groups	Corruption Perception Index	The CPI scores and ranks countries/territories based on how corrupt a country's public sector is perceived to be by experts and business executives.	Transparency International (2020)
Primacy of order over discretionary policy	Overall Score	Geometric mean of below 4 indicators	Author's calculation
	Proxy for avoidance of sector interventions: Distortive effects of taxes and subsidies on competition	Response to the survey question "In your country, to what extent do fiscal measures (subsidies, tax breaks, etc.) distort competition?" [1 = distort competition to a great extent; 7 = do not distort competition at all]	WEF (2019)

	Proxy for moderate stabilization policy: Debt Dynamics	Index measuring the change in public debt, weighted by a country's credit rating and debt level in relation to its GDP	WEF (2019)
	Proxy for market conform social policy: Macroeconomic Environment	Composite Measure of (1) government budget balance, (2) gross national savings, (3) inflation, (4) government debt, and (5) country credit rating	WEF (2017)
	Proxy for market conform environmental policy: Adjusted Savings	Adjusted savings: natural resources depletion (% of GNI)	WB (2020)

Market-Organizational Principles

Free Prices	Free Prices	Monetary freedom combines a measure of inflation with an assessment of various government activities that distort prices. Price stability without microeconomic intervention is the ideal state for the free market.	Heritage Foundations (2020)
Free Trade	Free Trade	Trade freedom is a composite measure of the extent of tariff and nontariff barriers that affect imports and exports of goods and services.	Heritage Foundations (2020)
Free Contracts	Free Contracts	The business freedom component measures the extent to which the regulatory and infrastructure environments constrain the efficient operation of businesses. The quantitative score is derived from an array of factors that affect the ease of starting, operating, and closing a business.	Heritage Foundations (2020)
Private Property Rights	Private Property	The property rights component assesses the extent to which a country's legal framework allows individuals to acquire, hold, and utilize private property, secured by clear laws that the government enforces effectively. Relying on a mix of survey data and independent assessments, it provides a quantifiable measure of the degree to which a country's laws protect private property rights and the extent to which those laws are respected. It also assesses the likelihood of state expropriation of private property	Heritage Foundations (2020)
Private Liability	Efficiency of legal framework in settling disputes	Response to the survey question "In your country, how efficient are the legal and judicial systems for companies in settling disputes?" [1 = extremely inefficient; 7 = extremely efficient]	WEF (2019)
Price Stability	Inflation	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.	WB (2020)
Constancy of Economic Policy	Government ensuring Policy Stability	Response to the survey question "In your country, to what extent does the government ensure a stable policy environment for doing business?" [1 = not at all; 7 = to a great extent]	WEF (2019)

Market-Failure Correcting Principles

Competition Policy	Effectiveness of anti-monopoly policy	In your country, how effective are anti-monopoly policies at ensuring fair competition? [1 = not effective at all; 7 = extremely effective]	WEF (2017)
Income Policy	Social Protection	Proportion of population covered by at least one social protection benefit, by sex (%)	UNSTAT (2019)
Labor Market Policy	Overall Score	Geometric mean of below two indicators	Author's calculation
	Cooperation in labour-employer relations	Response to the survey question "In your country, how do you characterize labour-employer relations?" [1 = generally confrontational; 7 = generally cooperative]	WEF (2019)

	Workers' rights	Score adapted from the ITUC Global Rights Index, which measures the level of protection of internationally recognized core labour standards. The scale of this indicator ranges from 0 (no protection) to 100 (high protection)	WEF (2019)
Environmental Policy	Environment-related treaties in force	Total number of ratified environmental treaties (0–29 scale, where 29 is best)	WEF (2019)

2.1. Estimating Missing Observations

To estimate the missing observations of the Social Market Economic Input Variables, I employ a simple ordinary least square regression of the following kind:

$$SME\ Input\ Variable_i$$
$$= \beta_0 + \beta_1 \times ln\,(y)_i + \beta_2 \times p2_i + \sum_j \beta_{2+j} \times Regional\ Dummies_i + u_i \qquad (1)$$

where

    i = country i

    j = count of regional fixed effects

Below Table 2 lists and describes the variables, highlights performed transformations and provides sources. Table 3 presents the regression results.

Table 2: Estimating Missing Observations for Social Market Economic Input Variables - Data Description and Sources

Indicator	Abbreviation	Description	Transformation	Source
SME Input Variable	-	See Table 1 for details	ln(Adjusted Savings +1) ln(Inflation + min)	See Table 1
Income per capita	y	Per capita GDP at constant 2015 prices – US Dollars	ln(y)	UNSTAT (2020)
Democracy	p2	Index between -10 and +10 with negative scores indicating autocracies, scores between 1 and 6 describing anocracies, and scores of 7 and greater identifying democracies.	-	CSP (2018)
Regional Dummies	EAP	East Asia and the Pacific	1, if country part of region, 0 otherwise	Author's Definition WB Classification except for WE and EECA
	EECA	Eastern Europe and Central Asia (former socialist countries)		
	LAC	Latin America and the Caribbean		
	MENA	Middle East and North Africa		
	SA	South Asia		
	SSA	Sub-Saharan Africa		
	WE	Western Europe		

Table 3: Regression Results to Estimate Missing Observations for Input Variables

DVs \ IVs	const	Income per capita	Democracy	EAP	EECA	LAC	MENA	SA	SSA	WE	n	R2	F-Stat
Democracy	-	-	-	-	-	-	-	-	-	-	-	-	-
Subsidiarity	0.04 (0.21)	0.08* (0.02)	0* (0)	-0.3* (0.13)	-0.32* (0.13)	-0.39* (0.13)	-0.51* (0.14)	-0.3* (0.15)	-0.4* (0.14)	-0.26* (0.13)	161	0.51	17.26
Protection from Special Interest Groups	-37.37* (11.5)	10.1* (0.85)	0.69* (0.15)	-8.12 (7.59)	-13.34* (7.43)	-18.19* (7.48)	-13.17* (7.69)	-4.81 (8.44)	-5.58 (7.82)	-4.65 (7.35)	164	0.74	49.67
Primacy of order over discretionary policy	-	-	-	-	-	-	-	-	-	-	-	-	-
Distortive effects of taxes and subsidies on competition	1.11 (0.73)	0.31* (0.06)	-0.02 (0.01)	0.27 (0.45)	-0.06 (0.44)	-0.54 (0.44)	0.18 (0.46)	0.36 (0.52)	0.2 (0.46)	0.09 (0.43)	134	0.44	10.61
Debt Dynamics	0.29 (0.95)	0.43* (0.07)	-0.01 (0.01)	1.22* (0.6)	0.92 (0.59)	0.59 (0.59)	0.34 (0.61)	1.2* (0.67)	0.66 (0.62)	0.59 (0.58)	143	0.40	10.01
Macroeconomic Environment	-0.71 (0.75)	0.53* (0.06)	-0.01 (0.01)	0.08 (0.46)	-0.14 (0.45)	-1.33* (0.45)	-0.58 (0.47)	0.17 (0.53)	-0.41 (0.48)	-0.19 (0.44)	134	0.71	33.70
Adjusted Savings	1.99* (1)	-0.09 (0.07)	-0.06* (0.01)	0.32 (0.65)	0.03 (0.64)	0.41 (0.64)	0.25 (0.66)	-0.57 (0.73)	0.62 (0.67)	-0.27 (0.63)	163	0.35	8.98
Free Prices	40.87* (10.35)	2.79* (0.77)	0.51* (0.13)	10.18 (6.73)	7.92 (6.61)	2.92 (6.65)	7.07 (6.83)	8.98 (7.52)	11 (6.95)	5.12 (6.52)	163	0.24	5.37
Free Trade	39.08* (9.87)	3.91* (0.73)	0.22* (0.13)	2.73 (6.41)	7.51 (6.3)	-0.23 (6.34)	-2.36 (6.51)	-1.11 (7.17)	-2.06 (6.63)	2.73 (6.22)	163	0.49	16.66
Free Contracts	15.32 (12.37)	5.78* (0.91)	0.5* (0.16)	2.55 (8.14)	-0.4 (8)	-10.95 (8.05)	-3.29 (8.27)	1.55 (9.08)	-7.04 (8.41)	-2.97 (7.9)	164	0.54	20.04
Private Property Rights	-22.21* (11.82)	9.33* (0.87)	0.64* (0.15)	1.4 (7.79)	-1.01 (7.65)	-16.1* (7.7)	-4.1 (7.91)	1.45 (8.68)	-2.95 (8.04)	-1.22 (7.56)	164	0.72	43.30
Private Liability	0.94 (0.92)	0.39* (0.07)	-0.02 (0.01)	-0.17 (0.57)	-0.92* (0.55)	-1.33* (0.56)	-0.23 (0.58)	-0.05 (0.65)	0.01 (0.59)	-0.45 (0.54)	134	0.46	11.71
Price Stability	-	-	-	-	-	-	-	-	-	-	-	-	-
Constancy of Economic Policy	0.66 (1.02)	0.43* (0.08)	-0.02 (0.02)	-0.15 (0.63)	-0.75 (0.61)	-0.84 (0.62)	-0.42 (0.64)	0.05 (0.72)	0.09 (0.65)	-0.17 (0.6)	134	0.39	8.65
Competition Policy	1.14* (0.66)	0.38* (0.05)	-0.01 (0.01)	-0.41 (0.42)	-0.88* (0.41)	-1.14* (0.41)	-0.9* (0.43)	-0.37 (0.47)	-0.45 (0.43)	-0.3 (0.4)	143	0.59	20.95
Income Policy	-53.1* (24.4)	12.12* (1.94)	1.06* (0.36)	-16.11 (14.06)	11.72 (13.95)	-12.86 (14.06)	-29.68* (14.5)	-27.45* (16.04)	-23.48 (15.16)	5.36 (13.61)	110	0.75	32.95
Labor Market Policy	-	-	-	-	-	-	-	-	-	-	-	-	-
Cooperation in labor-employer relations	3.16* (0.69)	0.19* (0.05)	-0.01 (0.01)	-0.06 (0.42)	-0.4 (0.41)	-0.59 (0.42)	-0.33 (0.43)	-0.28 (0.49)	-0.36 (0.44)	-0.09 (0.4)	134	0.33	6.74
Workers' rights	32.06 (22.91)	2.91 (1.83)	1.15* (0.34)	9.54 (13.37)	13.57 (13.03)	3.52 (13.15)	-5.66 (13.66)	5.95 (15.49)	13.42 (14.07)	12.48 (12.74)	121	0.35	6.73
Environmental Policy	5.86* (3.38)	0.93* (0.26)	0.23* (0.05)	7.4* (2.07)	6.31* (2.02)	6.07* (2.04)	6.71* (2.12)	7.08* (2.39)	8.2* (2.15)	8.7* (1.98)	134	0.46	11.97

2.2.   Calculating Weights

I calculate the SMEX from the 15 resulting SME input variables as a weighted average. Since many of the variables are highly correlated, variables that correlate less with all other variables receive a higher weight. I identify weights from a correlation matrix of all variables.

The weights w_i are calculated as follows:

$$w_i = \frac{\arg\min S + \arg\max S - c_i}{\sum_{i=0}^{n} \arg\min S + \arg\max S - c_i} \tag{2}$$

where

> r = correlation coefficient
>
> i, j = columns, row of correlation matrix = Input Variable

$$c_i = \sum_{j=0}^{n} |r_{ij}|$$

$$S = \{c_i\}$$

After identifying the weights, I calculate the SMEX as

$$SMEX_c = \sum_{i=0}^{n} observation_i \times weight_i \tag{3}$$

where

> $c = Country$
>
> $i = Input\ variable$

Lastly, I scale the SMEX between 0 and 100 such that 0 is worst and 100 is best.

3. Data for Social Market Economic Output

To estimate the relationship between the Social Market Economic Performance Index and the Social Market Economic output variables, I employ logistic regressions and a simple ordinary least square regression of the following kind:

$$p(Social\ Peace+1)_i = \frac{1}{1+e^{-\left(\beta_0+\beta_1\times SMEX_i+\sum_j \beta_{2+j}\times Controls_{ij}+u_i\right)}} \tag{4}$$

$$p(Equal\ Opportunity+1)_i = \frac{1}{1+e^{-\left(\gamma_0+\gamma_1\times SMEX_i+\sum_j \gamma_{2+j}\times Controls_{ij}+u_i\right)}} \tag{5}$$

$$p(Ecological\ Sustainability+1)_i = \frac{1}{1+e^{-\left(\delta_0+\delta_1\times SMEX_i+\sum_j \delta_{2+j}\times Controls_{ij}+u_i\right)}} \tag{6}$$

$$Economic\ Prosperity_i = \varepsilon_0 + \varepsilon_1 \times SMEX_i + \sum_j \varepsilon_{1+j} \times Controls_{ij} + u_i \tag{7}$$

where

i = country i

j = numeration for control variables

Below Tables 4 and 5 list and describe the output and control variables and provide sources. Table 6 presents the regression results.

Table 4: Focus Dependent Variables

SME Output	Indicator	Definition	Source
Social Peace			
Conflict Free Plurality	Global Freedom Index	A country or territory's Freedom in the World status depends on its aggregate Political Rights score, on a scale of 0–40, and its aggregate Civil Liberties score, on a scale of 0–60. The total Political Rights and Civil Liberties scores are equally weighted in this calculation	Freedom House (2020)
Equal Opportunity			
Individual Capabilities	Equal Opportunity Index	Geometric mean of below three indicators	Author's Calculation
Public Health	Infant Mortality	Under-5 mortality rate (probability of dying before the age of 5 per 1,000 livebirths)	IHME (2020)
Gender Equality	Gender Inequality Index	A composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labour market. (0-1, where 1 is worst)	UNDP (2019)
Financial Inclusion	Account ownership	Account ownership at a financial institution or with a mobile-money-service provider (% of population ages 15+)	WB (2020)
Ecological Sustainability			
Future Prospects	Electricity production from renewable sources	Electricity production from renewable sources, excluding hydroelectric, includes geothermal, solar, tides, wind, biomass, and biofuels.	WB (2020)
Economic Opportunity			
Income per capita	GDP per capita	Per capita GDP at constant 2015 prices – US Dollars	UNSTAT (2020)

SME Controls	Indicator	Definition	Transformation	Source
Income per capita	GDP per capita	Per capita GDP at constant 2015 prices – US Dollars	ln-transformed	UNSTAT (2020)
Ethnic Fractio-nalization	Historical Index of Ethnic Fractio-nalization	The ethnic fractionalization index corresponds to the probability that two randomly drawn individuals within a country are not from the same ethnic group.		Drazanova (2019)
Religious Polarization	Religious Polarization Index	Author's Calculation: Calculated as probability to get 6 people with same religion		Maoz & Henderson (2019)
Manufactures and Services Export Share	Manufactures and Services Export Share	Author's Calculation: Calculated as a percentage of GDP, using the variables Merchandise exports by the reporting economy (current US$), Manufactures exports (% of merchandise exports), Service exports (BoP, current US$), and GDP (current US$).	ln-transformed	WB (2020)
Natural Resource Rents	Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	ln-transformed	WB (2020)
Years since Independence	Date of Independence	The date on which this state became independent -- i.e., acquired control of its own foreign policy, without being ruled by a foreign power.	Year 2020 minus year in which the country became independent	Hensel & Mitchell (2007)
Colonial Past	Type of Independence = Decolonization	The entity was a dependency ruled by a foreign power before achieving independence. (Note that this includes traditional colonies, protectorates, and parts of empires, as well as any other entities that were ruled by a foreign power or that were part of an entity that was not in the COW system.)	1, if true, 0 otherwise	Hensel & Mitchell (2007)
Former Western Colony	Entity from Which Independence Was Gained	This is the COW country code for the state, empire, or other entity from which this state gained independence. This variable is coded as missing where the state did not gain independence from a COW system member (e.g., by unifying local units into a new state).	1, if country gained independence from Western Hegemon (UK, Netherlands, Belgium, France, Spain, Portugal, Germany (Prussia), Austria (-Hungary), Italy (Sardinia), Sweden, Denmark), 0 otherwise	Hensel & Mitchell (2007)
Former Western Hegemon	Former Western Hegemon	UK, Netherlands, Belgium, France, Spain, Portugal, Germany (Prussia), Austria (-Hungary), Italy (Sardinia), Sweden, Denmark	1, if country part of group, 0 otherwise	Hensel & Mitchell (2007)
Regional Dummies	EAP	East Asia and the Pacific	1, if country part of region, 0 otherwise	Author's Definition WB Classification except for WE and EECA
	EECA	Eastern Europe and Central Asia (former socialist countries)		
	LAC	Latin America and the Caribbean		
	MENA	Middle East and North Africa		
	SA	South Asia		
	SSA	Sub-Saharan Africa		
	WE	Western Europe		

Table 6: Regression Results

DV / IV	Social Peace	Equal Opportunity	Ecological Sustainability	Income per Capita
const	-1.87 (1.49)	-6.41* (1.14)	-0.32 (2.32)	6.82* (0.62)
SMEX	0.07* (0.01)	0.02* (0.01)	0.05* (0.01)	0.04* (0.00)
Income per capita	-0.11 (0.15)	0.63* (0.12)	-0.31 (0.25)	-
Ethnic Fractionalization	-0.47 (0.47)	-0.51 (0.39)	0.37 (0.8)	0.18 (0.27)
Religious Polarization	0.2 (0.38)	0.59* (0.32)	-0.82 (0.68)	0.82* (0.21)
Manufactures and Services Export Share	0.04 (0.1)	-0.02 (0.08)	0.13 (0.16)	0.18* (0.06)
Natural Resource Rents	-0.03 (0.12)	0.02 (0.1)	-0.64* (0.19)	0.13* (0.07)
Years since Independence	0.00* (0.00)	0.00 (0.00)	0.00* (0.00)	0.00 (0.00)
Colonial Past	0.14 (0.31)	0.15 (0.24)	-0.73 (0.47)	-0.28 (0.18)
Former Western Colony	0.05 (0.31)	-0.51* (0.24)	0.23 (0.48)	0.01 (0.18)
Former Western Hegemon	-0.9 (0.61)	-0.9* (0.45)	0.59 (0.89)	-0.67* (0.34)
EAP	-0.59 (0.89)	0.63 (0.67)	-0.01 (1.31)	-1.04* (0.51)
EECA	-0.65 (0.92)	0.46 (0.69)	-0.82 (1.35)	-1.11* (0.52)
LAC	0.7 (0.89)	0.24 (0.66)	0.94 (1.29)	-0.39 (0.51)
MENA	-0.91 (0.9)	0.36 (0.67)	-0.57 (1.32)	0.11 (0.52)
SA	-0.13 (1.01)	0.58 (0.75)	-0.92 (1.55)	-1.43* (0.57)
SSA	0.06 (0.91)	0.23 (0.68)	0.48 (1.35)	-1.69* (0.51)
WE	1.84* (0.94)	1.73* (0.69)	-0.32 (1.36)	-0.01 (0.54)
n	151	135	124	151
Adj. R2	0.71	0.78	0.53	0.79
F-Stat	22.09	29.32	9.06	37.06

4. Simulation Framework

Changes in the SME input variables will result in an according SMEX:

$$SMEX_i^* = -43.9 + 1.67 \times SMEWA_i^* \tag{8}$$

Where

$* = variable\ after\ change$

$i = Country\ i$

$SMEWA = Social\ Market\ Economic\ Performance\ Index$

Using the regression coefficients then allows to estimate the impact of a change in social market economic performance on social peace, equal opportunity, ecological sustainability, and economic prosperity:

$$Social\ Peace_i^* = \frac{1}{1+e^{-\left(\beta_0+\beta_1\times SMEX_i^*+\sum_j \beta_{2+j}\times Controls_{ij}+u_i\right)}} - 1 \tag{9}$$

$$Equal\ Opportunity_i^* = \frac{1}{1+e^{-\left(\gamma_0+\gamma_1\times SMEX_i^*+\sum_j \gamma_{2+j}\times Controls_{ij}+u_i\right)}} - 1 \tag{10}$$

$$Ecological\ Sustainability_i^* = \frac{1}{1+e^{-\left(\delta_0+\delta_1\times SMEX_i^*+\sum_j \delta_{2+j}\times Controls_{ij}+u_i\right)}} - 1 \tag{11}$$

$$Economic\ Prosperity_i^* = \varepsilon_0 + \varepsilon_1 \times SMEX_i^* + \sum_j \varepsilon_{1+j} \times Controls_{ij} + u_i \tag{12}$$

Where

$* = variable\ after\ change$

$i = Country\ i$

$j = numeration\ for\ control\ variables$

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