



NATIONAL RESEARCH
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The role of social capital in national football team success

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Social capital in team performance

- Social capital - ‘the ability of people to work together for common purposes in groups and organizations’ (Fukuyama 1995, p. 10)
- Hence, social capital should be a critical ingredient for team performance
- Surprisingly, this conjecture has not yet been tested for sport teams, and the present paper fills this gap

Why social capital matters?

- Moral hazard in teams
 - individual contributions are **unidentifiable** and unmeasurable, which could lead to **free riding**
 - social capital involves **pro-social motivation**, commitment to team's success irrespective of individual costs and benefits
 - social capital stimulates team members to exert **efforts**
- Cooperation
 - in highly interactive teams transformation of individual efforts to a team success requires cooperation

The case of national football teams

- Availability of rich data
- Large stream of academic literature
- Weakness of direct material motivation, and hence better chances to capture the contribution of social capital

Hypotheses

- NFT players have ***pro-social motivation*** in addition to the implicit incentive of career concerns
- The **efficiency of collective actions** increases with social capital
- ***SC complements*** individual skills as factor of team success

Results

- We show that multiple factors that are known to matter for football team performance can be aggregated into the team talent measure, which is based on players' aggregate market values. We derive such measure and use the **mediation** test to show that it indeed captures multiple other factors.
- We independently derive **alternative measures of social capital** based on several international surveys, and present general and empirical (**placebo tests**) evidence that such measures are valid for our purposes.
- We propose a **theory** that shows that talent and social capital are significant contributors to teams; success independently from each other, but also that they complement each other, and test these predictions empirically.
- We use multiple sources of **data** and various social capital measures and models specifications to robustly observe the predicted effects.

Moral hazard and collective actions



Bergstrom, Blum, Varian, 1986; Andreoni, 2006; Benabou, Tirole, 2006; Bartling, Siemens, 2010; Calabuig et al., 2016

- Principal-agent problem with unobservable individual effort drives moral hazard in teams
- The actual level of effort in teams often exceeds the one predicted by theory
- Pro-social motivation is one of the possible explanations to this phenomenon
- Pro-social motivation may resolve collective action problem and increases social welfare

Factors of NFT success



Hoffmann et al., 2002; Houston, Wilson, 2002; Macmillan, Smith, 2007; Berlinschi et al., 2013; Leeds, Leeds, 2009

- Income, population, climate, oil production, the power of national championship, migration of national team players, political regime, latin culture, football history

The role of national culture

✓ Cultural heterogeneity in clubs



Maderer et al., 2014

- Negative effect of cultural diversity
- No support for the hypothesis “The more collectivist a team is, the more successful it is” (average national individualism/collectivism scores of Hofstede (2001))



Slater et al., 2018

- Team passion displayed during national anthems is associated with subsequent success



Miguel et al., 2008

- Civil war in home country and soccer violence



Fisman, Miguel, 2007

- Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets

Players' motivation

✓ Do players have a vested interest in a national team win? *To what extent does the FIFA WC team performance determine immediate change in market value?*

- MV before and after the World Cup 2014
- National football team performance at the World Cup 2014 (number of points)
- 50 biggest changes in market value
- $\text{Corr}=0.004$, $t\text{-stat}=0.025$



Coupe, 2007

- No link between cumulative bonuses to players and the performance of the team on the World Cup 2006

Theoretical model

Dewatripont, Jewitt, Tirole (1999). The economics of career concerns

Team output:

$$y = \sum_{i=1}^n (\lambda\theta_i + \gamma a_i (\mu + \theta_i)) + \varepsilon$$

- $\lambda, \mu > 0$
- $\theta_i \sim N(\bar{\theta}, \sigma_{\theta}^2), i. i. d.$
- $\varepsilon \sim N(0, \sigma_{\varepsilon}^2)$
- $\gamma \geq 1$

θ_i - individual talent

a_i - individual effort

λ - talent contribution

γ - efficiency of collective action

μ - effort contribution

Theoretical model

Dewatripont, Jewitt, Tirole (1999). The economics of career concerns

Explicit incentives of immediate financial gain are **weak** for national team players

The *expected reward* or the career concern of players is $E(\theta_i | y, a^*)$

Player's problem:

$$\max_{a_i \geq 0} \alpha E y + E_y E_\theta (\theta_i | y, a) - c(a_i)$$

F.O.C.:

$$\alpha \gamma (\mu + \bar{\theta}) + \frac{\gamma (\mu + \bar{\theta}) (\lambda + \gamma a_i) \sigma_\theta^2}{\sigma_\theta^2 \sum_{j=1}^n (\gamma a_j + \lambda)^2 + \sigma_\varepsilon^2} = c'(a_i)$$

θ_i - individual talent

a_i - individual effort

λ - talent contribution

γ - efficiency of collective action

μ - effort contribution

α - pro-social motivation

Proposition 1

- a^* increases with $\bar{\theta}$ (expected talent), α (pro-social motivation), γ (collective actions efficiency)

Proposition 2

- Ey increases with $\bar{\theta}$ (expected talent), α (pro-social motivation), γ (collective actions efficiency)

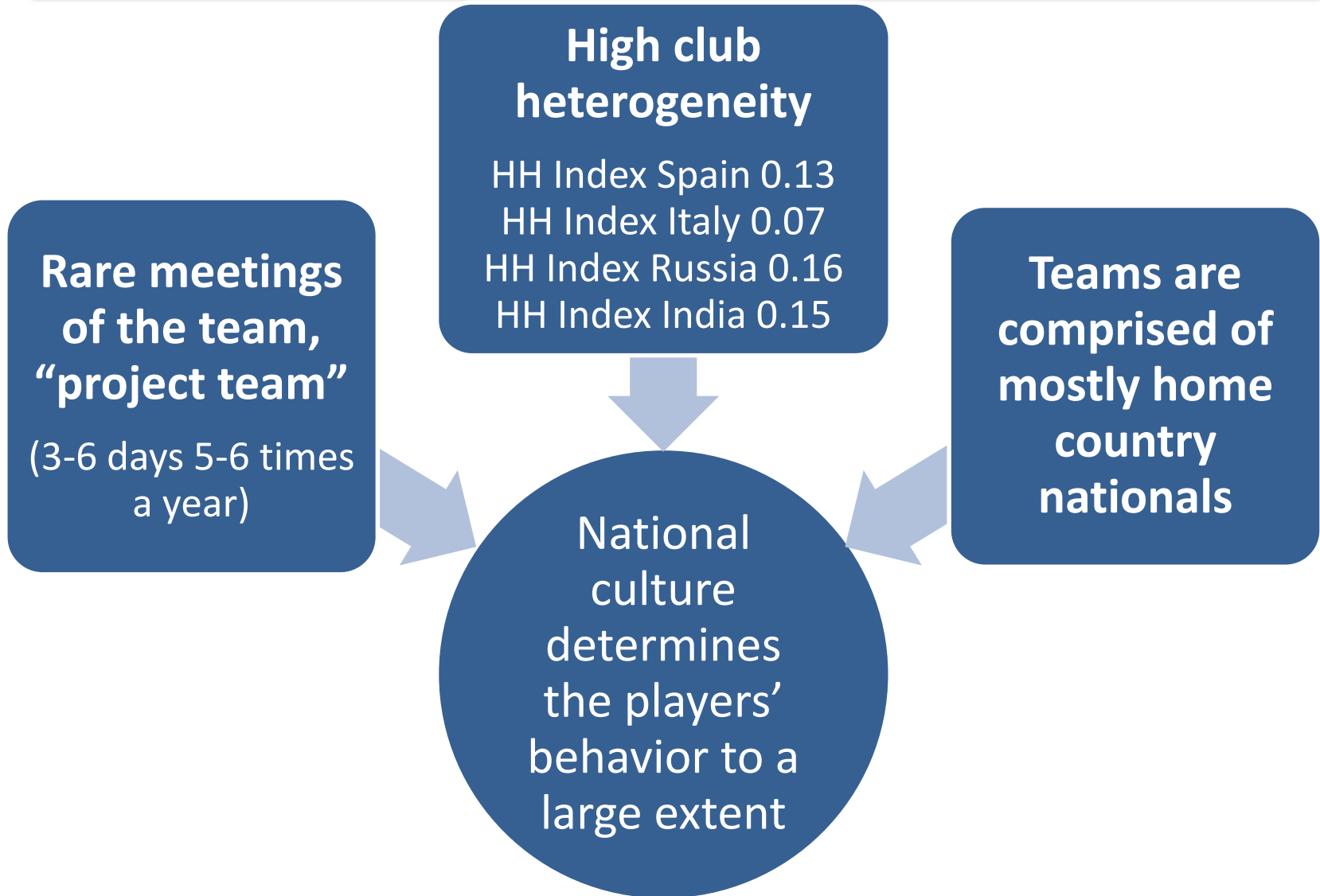
Proposition 3

- For sufficiently large n and non-decreasing effort elasticity on remuneration $\frac{ra'(r)}{a(r)}$ one has complementarity effect of sc variables α and γ together with talent: $\frac{\partial^2}{\partial \alpha \partial \bar{\theta}} Ey > 0, \frac{\partial^2}{\partial \gamma \partial \bar{\theta}} Ey > 0.$

Empirical hypotheses

- Team talent positively affects NFT performance
- Social capital positively affects NFT performance
- Team talent and social capital interaction term positively affects NFT performance

Why do we use national SC?



Placebo test for FIFA World Cup 2018

- Final stage of the FIFA World Cup 2018 in Russia
- 120 team-game observations
- Hypothesis:

Social capital and talent at the team level contribute positively to a team performance measured by open play goals, while there is no effect for set piece and penalty goals scored, as they rely on an individual talent and effort mostly



Individualism/collectivism score (Hofstede et al., 2010)

- Collectivist culture (Hofstede): “tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty”
- commercial airline pilots and students in 23 countries, civil service managers in 14 countries, 'up-market' consumers in 15 countries and 'elites' in 19 countries

Placebo test for FIFA World Cup 2018

Variable		Mean	Std. Dev.	Min	Max
Goals_total	number of goals scored	1.320	1.157	0	6
Open_play	number of open play goals scored	0.617	0.805	0	3
Set_piece	number of set piece goals scored	0.336	0.551	0	2
Counter_attack	number of counter attack goals scored	0.102	0.303	0	1
Penalty	number of penalty goals scored	0.172	0.399	0	2
Own_goal	number of own goals scored	0.094	0.293	0	1
Rating	based on the results of teams demonstrated at the final stage of the 2018 World Cup	6.711	0.188	6.13	7.06
IDV	individualism/collectivism Hofstede score	37.942	21.949	2	75
TMV	team market value	18.175	16.198	0.435	52.2

Placebo test for FIFA World Cup 2018

	Dependent variable:				
	Goals Total	Open play	Set piece	Penalty	Set piece or Penalty
	(1)	(2)	(3)	(4)	(5)
TMV	0.038***	0.078***	0.035	-0.023	0.018
	(2.72)	(3.86)	(1.20)	(0.48)	(0.73)
IDV	0.010	0.026***	0.003	-0.007	-0.000
	(1.53)	(2.67)	(0.26)	(0.43)	(0.03)
Rating_opp	-1.480***	-1.902***	-0.330	-0.697	-0.444
	(3.21)	(2.87)	(0.34)	(0.51)	(0.56)
TMV*IDV	-0.0005*	-0.001***	-0.000	0.000	-0.000
	(1.83)	(2.90)	(0.83)	(0.43)	(0.47)
const	9.499***	10.689***	0.702	3.133	2.089
	(3.07)	(2.58)	(0.11)	(0.34)	(0.39)
Prob > chi2	0.0001	0.000001	0.7275	0.9669	0.8741
N	120	120	120	120	120

Note: t-statistics in parenthesis; *** p<0.01, ** p<0.05, * p<0.1.

Performance measures

✓ the **FIFA World Ranking**

- Four-year period
- Was the **m**atch won or drawn? (M)
- How **i**mportant was the match? (I)
- How strong was the opposing **t**eam in terms of ranking position? (T)
- How strong was the **c**onfederation to which they belong? (C)
- **$P = M \times I \times T \times C$**
- *Fifapoints*
- *Fifarank*
- *Fifasuccess* =
$$\frac{\text{fifarank} - \max(\text{fifarank})}{\max(\text{fifarank})}$$

Controls

- **Clim:** deviation of average annual temperature from 14C
- **Inc:** GDP PPP
- **Pop:** population size
- **Hist:** years after the first national football team match


Team talent

- ✓ **TMV**: cumulative market value (transfermarkt.de)
- ✓ Expert estimates
- ✓ Proved to be highly correlated with actual wage (Frick, 2007)
- ✓ Weighted for playing time
- ✓ Discounted with APL inflation
- ✓ Have not been included into models of NFT success before
- ✓ Mediate a number of other traditional factors of NFT success

Sobel test results for ESS data set

	Effects			Proportion of total effect that is mediated
	Indirect effect	Direct effect	Total effect	
INC_PC	0.0017*** (2.95)	0.00021 (0.18)	0.0020 (1.54)	
POP	0.0021*** (4.86)	0.0012* (1.96)	0.0033*** (7.02)	0.649
CLIM	-0.0012*** (-4.8)	-0.00058 (-1.55)	-0.0019*** (-6.12)	0.691
hist	0.000607*** (2.90)	0.000316 (0.72)	0.000923** (2.02)	0.658

Social capital, Hofstede (1)

- ✓ 100 countries
- ✓ Social capital measures:
 -  Hofstede et al., 2010
 - Collectivist culture (Hofstede): “tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty”
 - commercial airline pilots and students in 23 countries, civil service managers in 14 countries, 'up-market' consumers in 15 countries and 'elites' in 19 countries

Social capital, ESS (2)

- ✓ 169 observations, 34 countries, 2004-2016 FIFA rank
- ✓ Social capital measures:
 - European Social Survey*
 - **Trust:** “Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?”
 - **Fair:** “Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?”
 - **Help:** “Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?”
 - **Care:** “It's very important to her/him to help the people around her/him. She/he wants to care for their well-being.”

Social capital, WVS (3)

- ✓ 111 observations, 33 countries, 2007-2014 FIFA rank
- ✓ Social capital measures:
 - World Values Survey*
 - **Trust:** “Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?”
 - **Fair:** “Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?”
 - **Help:** “Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?”
 - **Care:** “It's very important to her/him to help the people around her/him. She/he wants to care for their well-being.”

Additive effect, Hofstede (1)

	Dependent variable: fifapoints
tmv	5.88***
	(9.81)
inc	-0.001
	(-0.51)
pop	-0.117
	(-0.22)
pop2	-0.000001
	(-0.00001)
clim	-0.22
	(-0.56)
hist	1.759*
	(1.67)
collectiv	0.162
	(-0.12)
const	311.35**
	(2.31)
R²	0.63
N	95

Additive effect, ESS (2)

	Dependent variable: fifarank			
	(1)	(3)	(5)	(7)
	NBREG1	NBREG2	NBREG3	NBREG4
VARIABLES	fifarank	fifarank	fifarank	fifarank
TMV	-0.00968*** (-15.78)	-0.00980*** (-18.37)	-0.00999*** (-14.40)	-0.00976*** (-14.86)
INC_PC	0.00324 (0.604)	0.00586 (1.208)	0.00177 (0.398)	0.00241 (0.379)
POP	-0.00531** (-2.012)	-0.00501** (-2.141)	-0.00359 (-1.383)	-0.00422* (-1.673)
CLIM	0.00293*** (2.597)	0.00300** (2.546)	0.000959 (0.601)	0.00222 (1.354)
HIST	3.04e-05 (0.0231)	-0.000466 (-0.346)	-0.000802 (-0.608)	-7.24e-05 (-0.0603)
TRUST	-0.00700*** (-2.727)			
HELP		-0.00993*** (-4.414)		
CARE			-0.0163*** (-4.017)	
FAIR				-0.00446 (-1.076)
Constant	4.262*** (29.37)	4.297*** (28.46)	5.591*** (14.97)	4.239*** (26.30)
Observations	169	169	169	169

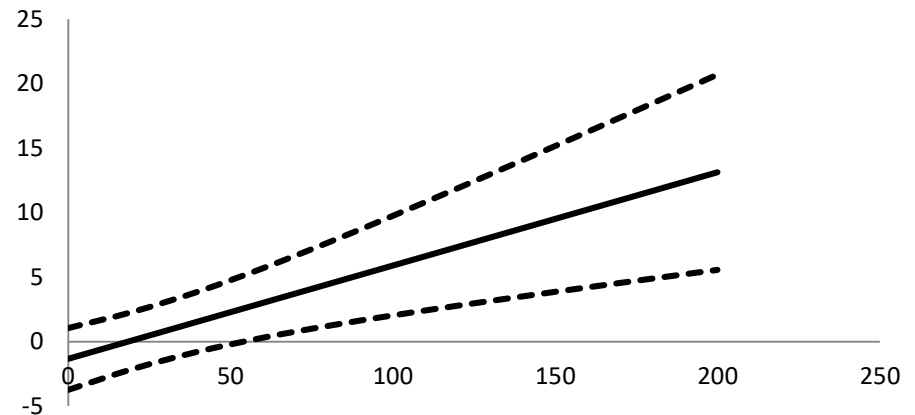
Additive effect, WVS (3)

	Dependent variable: <i>fifasuccess</i>		
	(1)	(2)	(3)
inc	2.81e-05***	2.49e-05**	3.11e-05*
	(4.929)	(3.208)	(2.698)
pop	-0.000339***	-0.000313**	-0.000369**
	(-4.294)	(-2.588)	(-4.519)
clim	-0.000309	-0.000346	-0.000105
	(-1.152)	(-1.465)	(-0.284)
hist	0.000921*	0.00111*	-0.000209
	(2.180)	(2.097)	(-0.383)
tmv	0.00208***	0.00192***	0.00370***
	(5.360)	(5.174)	(9.211)
trust	-0.00101		
	(-1.400)		
fair		-0.00404	
		(-1.306)	
care			0.00164
			(0.281)
const	0.532***	0.736***	0.437
	(16.28)	(6.634)	(1.851)
R²	0.479	0.476	0.526
N	111	105	57

Multiplicative effect, Hofstede (1)

	Dependent variable: fifapoints
inc	-0.001 (0.001)
pop	-0.140* (0.073)
clim	-0.007 (0.304)
hist	2.373** (0.951)
tmv	2.195** (1.010)
collectiv	-1.773 (1.368)
tmv*collectiv	0.072*** (0.021)
const	400.907*** (116.339)
R ²	0.64

Marginal effect of collectiv for different values of TMV

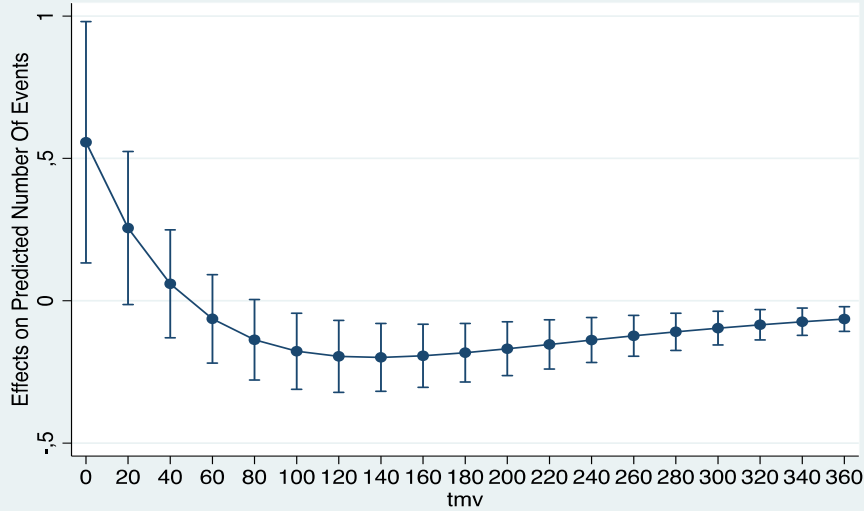


Multiplicative effect, ESS (2)

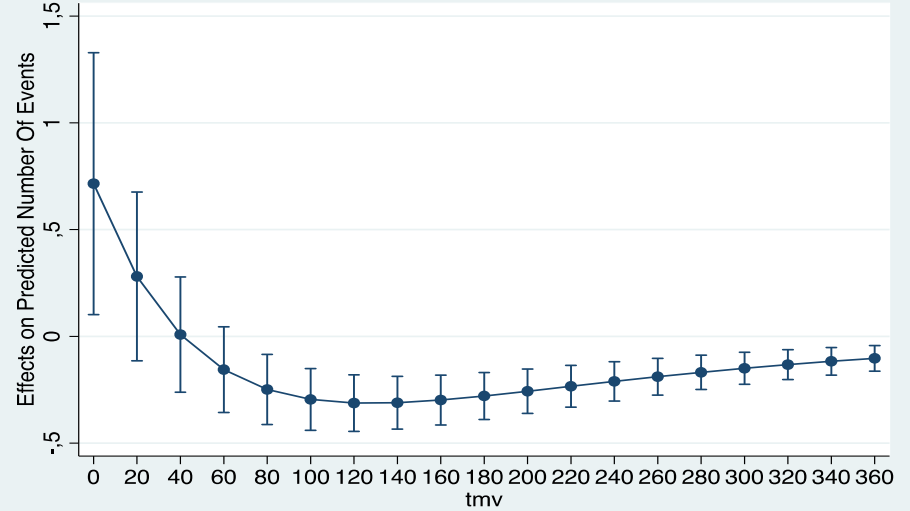
	Dependent variable: fifarank			
	(1)	(3)	(5)	(7)
VARIABLES	NBREG1	NBREG2	NBREG3	NBREG4
TMV	-0.00409**	-0.00290*	-0.00380	-0.00532**
	(-2.256)	(-1.713)	(-0.258)	(-2.287)
INC_PC	0.00284	0.00659	0.00142	0.00238
	(0.500)	(1.350)	(0.290)	(0.382)
POP	-0.00406	-0.00318	-0.00373	-0.00303
	(-1.523)	(-1.335)	(-1.334)	(-1.159)
CLIM	0.00148	0.00157	0.000991	0.00111
	(1.124)	(1.196)	(0.617)	(0.717)
HIST	-0.000330	-0.000387	-0.000593	-0.000150
	(-0.254)	(-0.282)	(-0.377)	(-0.123)
TRUST	0.00379			
	(1.039)			
TMV*TRUST	-0.000162***			
	(-3.275)			
HELP		0.00329		
		(1.060)		
TMV*HELP		-0.000231***		
		(-4.462)		
CARE			-0.0119	
			(-1.456)	
TMV*CARE			-6.94e-05	
			(-0.422)	
FAIR				0.00209
				(1.010)
TMV*FAIR				-9.96e-05**
				(-2.090)
Constant	3.935***	3.888***	5.194***	3.983***
	(23.88)	(19.53)	(7.359)	(19.83)
Observations	169	169	169	169

Multiplicative effect, ESS (2)

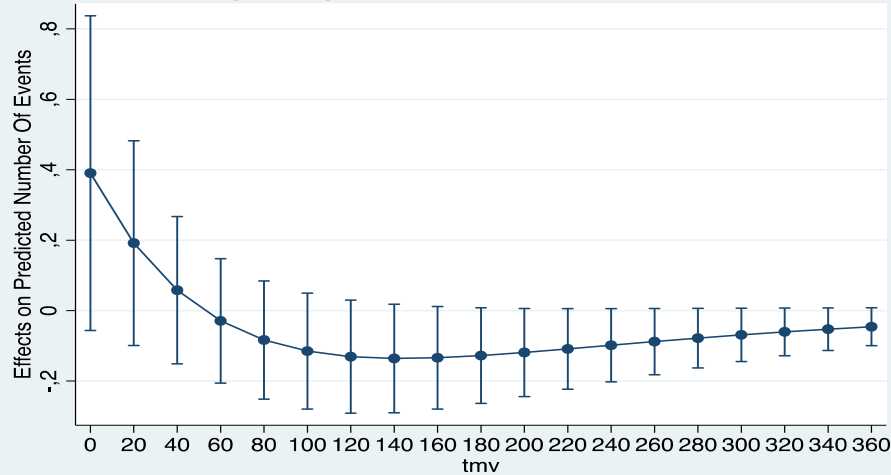
Average Marginal Effects of trust with 95% CIs



Average Marginal Effects of help with 95% CIs



Average Marginal Effects of fair with 95% CIs

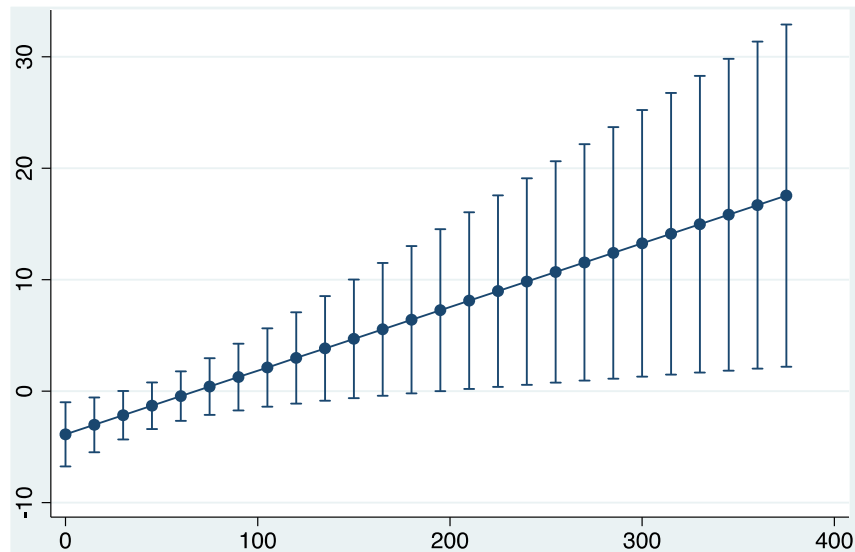


Multiplicative effect, WVS (3)

	Dependent variable: <i>fifasuccess</i>		
	(2)	(3)	(5)
inc	2.84e-05***	2.48e-05**	3.10e-05*
	(4.588)	(2.891)	(2.667)
pop	-0.000319***	-0.000295*	-0.000364**
	(-3.613)	(-2.190)	(-3.613)
clim	-0.000295	-0.000304	-9.54e-05
	(-1.172)	(-1.420)	(-0.240)
hist	0.000876*	0.000891	-0.000226
	(1.948)	(1.647)	(-0.435)
tmv	0.00146**	-0.00252	0.00481
	(2.564)	(-1.607)	(1.349)
trust	-0.00234*		
	(-2.203)		
tmv*trust	2.86e-05		
	(1.803)		
fair		-0.00735***	
		(-3.644)	
tmv*fair		8.38e-05**	
		(2.561)	
care			0.00268
			(0.534)
tmv*care			-2.56e-05
			(-0.289)
const	0.562***	0.931***	0.390
	(13.69)	(7.888)	(1.776)
R²	0.485	0.495	0.526
N	111	105	57

Multiplicative effect, WVS (3)

Marginal effect of trust for different values of TMV



Multiplicative effect, ESS (2)

	Dependent variable: fifarank			
	(1)	(3)	(5)	(7)
VARIABLES	NBREG1s	NBREG2s	NBREG3s	NBREG4s
TMV	-0.00499***	-0.00318**	-0.00515	-0.00564**
	(-3.033)	(-1.997)	(-0.398)	(-2.263)
TRUST	0.00807**			
	(2.406)			
TMV*TRUST	-0.000166***			
	(-3.543)			
HELP		0.0101**		
		(2.209)		
TMV*HELP		-0.000247***		
		(-5.100)		
CARE			-0.00851	
			(-1.174)	
TMV*CARE			-6.66e-05	
			(-0.458)	
FAIR				0.00579*
				(1.659)
TMV*FAIR				-0.000111**
				(-2.145)
Constant	3.881***	3.864***	4.952***	3.910***
	(21.24)	(18.52)	(7.684)	(18.71)
Observations	169	169	169	169

Conclusion

- ✓ National football team players have weak explicit material incentive for a team success
- ✓ Team performance in football *is determined* not only by talent of players, but also by their ability to work *cooperatively* for common goal (SC)
 - Pro-social motivation
 - Collective actions efficiency
- ✓ *National level social capital*, measured as perception of values and behavior in a society, can be used as a proxy for national football team social capital
- ✓ Social capital *complements* individual skills and talent