

CHALLENGING THE MASCULINITY INDEX – HYPOTHESIS AND EMPIRICAL FINDINGS

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Abstract

This article aims to review the validity of the definition of the Masculinity Index, one of the most cited dimensions in cross-cultural management. The study challenges the claims supporting the design of the Masculinity Index that are the basis of its applications in management theory and practice.

The paper is based on the empirical analysis of the MAS index utilizing standard quantitative approach. The authors ran cross-section regressions with control variables for the applications of the index that could be quantified.

The analysis provides empirical proof of the lack of validity of the MAS index to compare national cultures. As the results of the tested claims were proven to be statistically non-conclusive, the study opens the door to the possibility of not validating the hypothesis of the Masculinity index.

Despite a clear lack of correlation established, the authors recommend that further systematic analysis be conducted to review in depth whether the MAS index is to be used by academics and practitioners.

This paper is the first, to the knowledge of the authors, to challenge the MAS index validity as a cultural dimension, rather than the statistical results of the surveyed countries.

Keywords: Intercultural management, Cross-cultural management, Intercultural model, Masculinity/Femininity Index, Gender Equalitarianism

JEL Code: A14, M14, Z13

Introduction

The cultural background of organisations' stakeholders – managers and employees alike – is increasingly influencing contemporary management due to the accelerating globalization of the business environment (migration, multinational companies). Edward Hall, an American anthropologist, had suggested that a “hidden dimension” (Hall, 1966) was missing in the communication between people of various origins: culture.

In 1980, Geert Hofstede from the Netherlands was probably the first researcher to clearly and openly present the connection between culture and management using the data of employees' surveys conducted by IBM in 1968 and 1972 (Hofstede, 1980). His research became instantly renowned; widely used by scholars and one of the most cited works of cross-cultural management today (Baskerville, 2002). Hofstede defined four basic dimensions that shape the cultural background of nations and individuals, and described behavioural patterns based on such cultural profiles (see direct quotations in Appendix).

Out of those four dimensions, the Masculinity/Femininity index (MAS Index hereafter) is clearly Hofstede's own contribution as the others may easily be traced to many previous academic researches (see details in following section).

Along with the other dimensions, the MAS index was subsequently implemented into strategic management theories and incorporated into many studies and management publications. Generally, from a management point of view, Hofstede's original hypothesis is that masculine environments stress the assertiveness of the person and feminine environments focus more on care, attention and social surroundings.

Critical voices can be heard as well (Dumetz, 2012), however, the criticism focuses mostly on the methodological or theoretical aspects of the MAS index (see the details below). Since its introduction in the 80's, Hofstede's dimensions have been challenged for methodological shortcomings (Dorfman, 1988), but, quite surprisingly, no one (to our knowledge) has tested the original validity of the MAS index empirically, in relation to the behavioural patterns themselves. Many comparisons between the original statistical findings and other independent analysis have been conducted (Yeh, 1988), however, the early statement linking national cultures characteristics and some supposed influences from gender-inspired values has not been questioned. In other words, Hofstede's claim that MAS is "not meant to describe individuals, but dominant patterns of socialization ("mental programming") in nations" has never been challenged and after more than three decades of massive use among lecturers and researchers. This is surprising.

Acknowledging the leading position the MAS index has acquired in current cross-cultural academic and managerial literature, a thorough study was needed to confirm whether a higher MAS index really leads to higher focus on assertiveness (and other claims) before we use it and link it to management theories and practices.

The purpose of this paper is simple – to perform a statistical test of Hofstede's hypothesis between the MAS Index and the proposed cultural behaviours by analysing their correlation, and to prove or deny its validity.

1. MAS Index definition and common critiques

In his original research Hofstede analysed the questionnaires in terms of 4 ‘cultural dimensions’ as mentioned above. Those dimensions, bi-polar continuums derived from factor analysis, were:

- PDI Index: Power distance (large versus small)
- IDV Index: Individualism versus Collectivism
- MAS Index: Masculinity versus Femininity
- UAI Index: Uncertainty Avoidance (strong versus weak)

While the concept of masculinity-femininity goes back to the 30’s the idea of applying such concept to entire national cultures is clearly Hofstede’s own contribution as all the other three dimensions can be traced to other researchers. A peculiarity of the MAS index, lays in the fact that countries’ scores have not changed over time. Through the various published editions, while the definition of the index has evolved, the statistical results remain the same. The evolution of the index definition clearly shows a desire to transform the index, from what appears as a series of stereotyped supposed values about men and women, into a more politically correct, business-related dimension, closer to the GLOBE’s Gender Egalitarianism (House, 2004).

Since the mid 90’s, Hofstede’s work, including the MAS index, has received considerable criticism that he defended vigorously. The model was criticized for several reasons:

- The usage of nationalities as a proxy for culture was criticized (McSweeney, 2002) but, as Hofstede responded, it is quite difficult to distinguish between culture and nation as we usually lack relevant data (Hofstede, 2002).
- Others highlighted methodological limits linked to the questionnaires, such as the use of the same questions for several dimensions (Dorfman, 1988).
- That the research database was out of date is a frequent comment (Jones, 2007). Even today, Hofstede relies on statistics based upon questionnaires answered in 1968 and 1972. Also, throughout his published editions, the MAS index results remain the same, based upon the assumption that cultural traits do not evolve significantly.
- Also, some challenge the status of the observer outside the culture (Baskerville, 2002), doubting the neutrality of the model design.

It is obvious from this list that the criticism is mostly theoretical and academic. Many consider Hofstede's contribution on culture as the most widely cited in the world (Bond 2002). However, few have asked and answered the simple question: Does the concept upon which the MAS index is built actually work?

We believe the roots of the many criticisms of Hofstede's MAS index lie in the genesis of the index. The MAS index is presented as an empirically obtained variable, which leads to inflexible statements about human behaviour. Yet, those statements are purely hypothetical. The easiest way to prove or deny its validity (either the validity of the index or the validity of related hypothetical behaviour patterns) is to correlate one against the other. This approach is simple to perform on a limited scale but it is not without difficulties and pitfalls.

Only a limited number of hypothesised behaviour patterns can be analysed; many are too abstract to be measured such as the claim that low MAS countries favour welfare societies (despite Venezuela being the third highest MAS indexed country and Chile #46). In another example, low MAS societies are supposed to favour resolving conflicts by compromise and negotiation, whereas high MAS countries "there is a feeling that conflicts should be resolved by a good fight". However, it can be assumed that if several relations are found to be statistically significant, the MAS index is indeed likely to impact human behaviour (and vice versa). The MAS index is justified throughout the publications with the help of many claims that are not quantifiable, but also not challenged, thanks mostly to the approximate validity of two extreme examples (usually USA for high MAS, and the country of origin of the author, the Netherlands for low MAS) that should not be enough to validate neither the entire list of countries, nor the dimension itself. Often, without the numerous illustrations displaying the Dutch and US cultures, the case for MAS index appears very weak. The authors of this paper believed a statistical comparison between two quantifiable claims and existing databases would shed a definite light on the challenged dimension.

2. Data and Method

From a statistical point of view, the authors recognize the necessity to control other factors that can possibly impact the MAS index and cause distorted results. For example, different socio-economic or institutional conditions may strongly influence the data and blur the MAS index validity.

We challenged the MAS index values with statements extracted directly from the book *Cultures and Organizations* (Hofstede 1991, 1984). We used longer-term average values of all

indicators to focus on long-term relationship rather than short-term deviations. 64 countries were included into the basic sample with their MAS values.

We used cross-section regression analysis utilizing common Ordinary Least Squares (OLS) method with control variables, when the output variable reflects some of the MAS index-based behaviour patterns that we found quantifiable. The general equation we estimate is

$$y_{ij} = b_0 + b_1 m_i + \sum_{n=1} c_n x_n + \varepsilon_i \quad (1)$$

where y is respective output j which is tested, mas is the value of MAS index and x are control variables.

We tested the following hypotheses with the respective output variables:

1. High MAS index countries have relatively higher Defence spending. Selected output variable: share of defence spending on GDP – *def*. Data were collected from World Bank database, average values from period 2003-2013. 63 observations out of 64 were included.
2. High MAS index countries have a relatively lower aid spending on poor countries. Selected output variable: share of aid¹ on GDP - *aid*. OECD database was used, average values for period 2008-2013. As the group of aiding countries is quite limited - 34 out of 64 have the data available.

We selected three independent factors (as control variables) that could possibly affect the dependent variable, besides the MAS. The first control variable is the United Nations' Human Development index - *hdi*, which is a more complex indicator than the usual GDP per capita and covers also education and quality of life. The second control variable is a dummy (0,1) variable of the countries' involvement in military conflict since WW2 – *con*. As a third control variable, we selected the countries' dominant religion, which could possibly influence all the output. We distinguish among three possible cases – dominant Christian – *dch*, dominant other (mostly Islam in our panel) – *dot* and not dominant religion in country – *nod*.

Estimates of (1) were performed by using standard OLS at first place. However, tests in residuals have often shown a problem of heteroskedasticity (Breusch-Pagan / Cook-Weisberg

¹ Official Development Assistance (ODA), net disbursements.

test was used). Therefore, we opted for linear regression using robust estimate of variance option in these cases.

3. Results

3.1. Hypothesis n° 1 – High MAS index countries have higher Defence spending

“Defence spending as a percentage of GNP is positively correlated with masculinity.” (1991 p.101).

Table 1: Defence spending

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Linear regression                                Number of obs =      63
                                                F( 5,    57) =     0.94
                                                Prob > F      =   0.4613
                                                R-squared     =   0.1430
                                                Root MSE     =   1.0883
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def	Robust HC3		t	P> t	[95% Conf. Interval]	
	Coef.	Std. Err.				
MAS	-.005544	.0060545	-0.92	0.364	-.017668	.00658
hdi	.8848565	2.642512	0.33	0.739	-4.406682	6.176395
con	.1979282	.3547697	0.56	0.579	-.5124859	.9083423
dch	-1.151346	.8615242	-1.34	0.187	-2.876518	.5738269
nod	-.9615347	.8720105	-1.10	0.275	-2.707706	.7846362
_cons	2.112967	1.445204	1.46	0.149	-.7810033	5.006938

Clearly, the MAS index model does not work well in this case. With MAS t-statistics (but also F-test) far below its critical level ($\alpha = 0,36 > 0,05$) we cannot find any statistically significant link between defence spending and MAS index so the hypothesis should be denied. Although, in theory, defence spending could be related to masculinity, the data analysis shows it is definitely not the case.

3.2. Hypothesis n° 2 – High MAS index countries have lower aid spending

“The only explanation of a high aid quote is a feminine national value system: the statistical correlation between aid in percentage of GNP and a country’s masculinity index score is strongly negative (high index, low aid quote).” (1991 p. 99-100)

Table 2: Aid to poor countries

Source	SS	df	MS	Number of obs = 30		
Model	.000252246	4	.000063062	F(4, 25) =	8.53	
Residual	.000184839	25	7.3936e-06	Prob > F	= 0.0002	
				R-squared	= 0.5771	
				Adj R-squared	= 0.5094	
Total	.000437086	29	.000015072	Root MSE	= .00272	

aid	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
MAS	-.0000688	.0000206	-3.34	0.003	-.0001113	-.0000264
hdi	.0458559	.0128044	3.58	0.001	.0194846	.0722271
con	0 (omitted)					
dch	.0013062	.0011119	1.17	0.251	-.0009837	.0035962
nod	0 (omitted)					
dot	.0006034	.0019098	0.32	0.755	-.00333	.0045368
_cons	-.0327213	.0115392	-2.84	0.009	-.0564867	-.0089559

For the case of international aid the model works quite well. We can see statistically significant negative relation between MAS and aid which is in line with the hypothesis ($\alpha = 0,003 < 0,05$). Also the R2 is reasonably high. It can be concluded that the more a country is feminine (lower MAS) the more it spends on aid. We can also see positive dependency between aid and HDI.

To summarize our results, one out of two hypotheses has been proven invalid. These results lead the authors to question Hofstede's hypothesis regarding the Masculine/Feminine dimension. Further analysis to Hofstede's claim should be conducted in order to determine whether the surveys and analyses that use the MAS index as an independent variable are either wrong or seriously flawed.

4. Conclusion/discussion

With his innovative 1980s work using questionnaires completed by IBM employees in 1968 and 1972, Geert Hofstede has rightly earned the honour of being considered one of the founders of cross-cultural management studies.

His model of cultural analysis using four dimensions has become a classic and the source of many publications. Despite a number of solid criticisms about various aspects of his concept, the validity of the dimensions themselves has not been challenged. The focus of most critics of Hofstede's model has been on analysing the statistical validity of the results of the countries' ranking per dimension. Such focus on the end result has actually over-shadowed the necessary analysis of the validity of the dimensions themselves.

The authors of this study decided to concentrate on this dimension because many of the claims supporting the MAS index seemed unrealistic. Publications after publications, the MAS index has been cited by professionals who eventually challenged the methodology of the analysis, but never questioned the theoretical backing of the dimension presented.

The very concept of the MAS index as a cultural dimension applicable to national cultures may appear to be proven wrong as a result of statistical estimations we have performed over the elements used by Hofstede to structure it. He provides many examples to support the validity of his dimension, but only a few can be related to quantitative data. We selected two of his claims about the consequences or applications of the MAS index: Defence spending, aid to poor countries. Those examples are frequently quoted to explain the MAS Index. In order to test the validity of the MAS index, we applied a linear model with several control variables. We used cross section data of long-term averages to focus on long-term relations rather than short-term deviations. The results we yielded are quite straightforward and lead to the denial of the MAS index as a valid explanatory variable for selected hypotheses. While the hypothesis linking MAS index to Defence spending was proven wrong, the hypothesis about aid – the more feminine the country is (lower MAS) the higher is its aid assistance, was proven correct.

While the concept of cultural dimensions in general remains valid, this study shows that linking some masculine or feminine values to cultural behaviours cannot be supported statistically. As a conclusion, the authors call for further analysis of Hofstede's claims regarding the definition of the MAS index. A systematic review of examples used to explain the concept of the MAS index needs to be conducted. All the claims that may be quantified should then be challenged to existing data, as performed in this current study. In the meantime, the authors advise academics and practitioners of cross-cultural management to use the MAS index in their work with care.

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8. Appendices: Data used in the study

Table 8 : MAS index and other data

Countries	MAS	def	aid	gii	sts	wmo	gpg	hdi	con	dch	dot	nod
Argentina	56	0,751	-	0,380	-	23,120	-	0,787	1	1	0	0
Australia	61	1,861	0,004	0,115	-	36,721	-	0,921	1	0	0	1
Austria	79	0,839	0,003	0,102	21	28,296	35,056	0,867	1	1	0	0
Bangladesh	55	1,150	-	0,518	-	23,389	-	0,523	1	0	1	0
Belgium	54	1,103	0,006	0,098	21	32,677	24,008	0,875	1	1	0	0
Brazil	49	1,508	-	0,447	-	36,078	-	0,726	0	1	0	0
Bulgaria	40	2,041	-	0,219	18	32,292	19,454	0,761	1	1	0	0
Canada	52	1,164	0,004	0,119	-	35,992	27,157	0,893	1	0	0	1
Chile	28	2,273	-	0,360	-	32,723	-	0,801	0	1	0	0
China	66	2,076	-	0,213	-	16,752	-	0,681	0	0	0	1
Colombia	64	3,427	-	0,459	-	-	-	0,696	1	1	0	0
Costa Rica	21	-	-	0,346	-	30,422	-	0,743	0	1	0	0
Czech Republic	57	1,398	0,001	0,122	17	28,060	25,277	0,850	1	0	0	1
Denmark	16	1,369	0,012	0,057	27	23,784	20,500	0,892	1	1	0	0
Ecuador	63	2,630	-	0,442	-	27,717	-	0,695	0	1	0	0
Estonia	30	1,889	0,001	0,158	32	36,226	31,422	0,825	1	0	0	1
Finland	26	1,307	0,006	0,075	25	29,507	19,285	0,872	1	1	0	0
France	43	2,341	0,005	0,083	10	38,510	17,750	0,874	1	1	0	0
Germany	66	1,321	0,004	0,075	16	37,808	21,900	0,897	1	0	0	1
Greece	57	2,694	0,002	0,136	55	28,326	23,800	0,846	1	1	0	0
Guatemala	37	0,462	-	0,539	-	-	-	0,602	0	0	0	1
Hungary	88	1,225	0,001	0,256	26	36,385	19,071	0,809	1	0	0	1
India	56	2,622	-	0,610	-	-	-	0,555	1	0	1	0
Indonesia	46	0,778	-	0,494	-	22,099	-	0,660	1	0	1	0
Ireland	68	0,553	0,005	0,121	16	31,883	21,100	0,893	1	1	0	0
Iran	43	2,766	-	-	-	13,280	-	0,715	1	0	1	0
Israel	47	7,186	0,001	0,144	-	32,120	36,462	0,876	1	0	1	0
Italy	70	1,723	0,002	0,094	27	33,243	26,267	0,862	1	1	0	0
Jamaica	68	0,763	-	0,458	-	-	-	0,705	0	1	0	0
Japan	95	0,986	0,002	0,131	-	-	-	0,880	1	0	1	0
Korea (South)	39	2,516	-	-	-	-	-	0,871	1	0	0	1
Luxembourg	50	0,589	0,009	0,149	27	-	18,889	0,878	1	1	0	0
Malaysia	50	1,935	-	0,256	-	24,225	-	0,757	0	0	1	0
Malta	47	0,682	-	0,236	28	17,349	14,650	0,811	0	1	0	0
Mexico	69	0,498	-	0,382	-	30,721	-	0,739	0	1	0	0
Morocco	53	3,446	-	0,444	-	12,795	-	0,590	1	0	1	0
Netherlands	14	1,365	0,008	0,045	16	27,477	42,500	0,902	1	0	0	1
New Zealand	58	1,038	0,003	0,164	-	39,953	-	0,899	1	0	0	1
Norway	8	1,578	0,015	0,065	-	31,333	15,485	0,936	1	1	0	0
Pakistan	50	3,675	-	0,567	-	2,967	-	0,517	1	0	1	0
Panama	44	0,980	-	0,503	-	48,077	-	0,747	0	1	0	0
Peru	42	1,361	-	0,387	-	19,437	-	0,715	1	1	0	0
Philippines	64	1,303	-	0,418	-	54,819	-	0,646	0	1	0	0
Poland	64	1,860	0,001	0,140	35	36,127	17,100	0,818	1	1	0	0
Portugal	31	1,956	0,002	0,114	28	31,178	13,250	0,808	1	1	0	0
Romania	42	1,598	-	0,327	35	29,394	11,870	0,766	1	1	0	0
Russian Federation	36	3,750	-	0,312	-	37,076	33,650	0,763	1	0	0	1
Singapore	48	3,833	-	0,101	-	31,437	-	0,871	0	0	0	1
South Africa	63	1,279	-	0,462	-	29,971	-	0,636	1	0	0	1
El Salvador	40	1,049	-	0,441	-	24,665	-	0,646	1	1	0	0
Slovak Republic	110	1,426	0,001	0,171	31	-	-	0,816	1	1	0	0
Slovenia	19	1,411	0,001	0,080	38	35,385	7,054	0,863	1	1	0	0
Spain	42	1,055	0,003	0,103	21	32,269	25,520	0,857	1	1	0	0
Suriname	37	1,200	-	0,467	-	-	-	0,695	0	0	0	1
Sweden	5	1,278	0,013	0,055	38	32,340	15,877	0,893	1	1	0	0
Switzerland	70	0,776	0,006	0,057	-	30,000	20,057	0,908	1	0	0	1
Thailand	34	1,414	-	0,360	-	23,693	-	0,702	0	0	1	0
Trinidad	58	0,551	-	-	-	43,478	-	0,752	0	0	0	1
Turkey	45	2,517	0,001	0,366	-	9,839	-	0,722	1	0	1	0
Uruguay	38	2,020	-	0,367	-	40,275	-	0,772	0	0	0	1
United Kingdom	66	2,322	0,006	0,205	12	34,599	25,900	0,887	1	0	0	1
United States	62	4,096	0,002	0,256	-	42,667	41,200	0,904	1	1	0	0
Venezuela	73	1,229	-	-	-	-	-	0,743	0	1	0	0
Vietnam	40	2,081	-	-	-	-	-	0,616	0	0	0	1

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