



Financial Market Evidence of Gold's Special Role in India

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Introduction

- Gold plays a very important role in India
 - Diwali, harvests and weddings (World Gold Council (2017))
 - often linked to culture (Sahay and Mukherjee (2016), Economist (2013)) and tradition (Bhalotra, Chakravarty, and Gulesci (2020))
- The economic and financial role of gold is less clear
- Negative role (current account) and positive role as a tool to relax credit constraints (gold as collateral/ pledging)?



Introduction

- Is gold's special role in India reflected in the link between stock prices and the price of gold?
- Are links due to a “golden” wealth effect or more direct/ fundamental because gold is part of the firm's business (e.g. gold mining, jewellery, finance - loans secured through gold as collateral)?



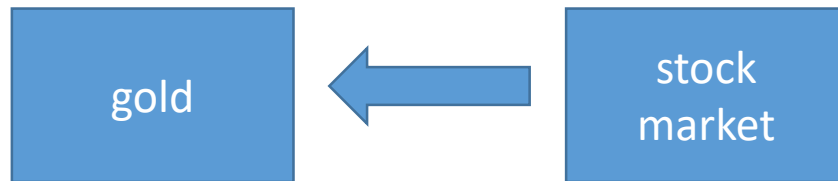
Contribution

- This paper aims to contribute to a better understanding of the role of gold with a focus on the link of Indian companies' share prices with the price of gold.
 - If there is a significant link for at least some Indian companies' share prices there is potentially more to gold than culture, tradition and emotions; gold plays is an investment, store of value and collateral to borrow against.
 - Focus of this study (in contrast to the studies of gold's safe haven status) is not on gold per se but on the role of gold on companies' share prices

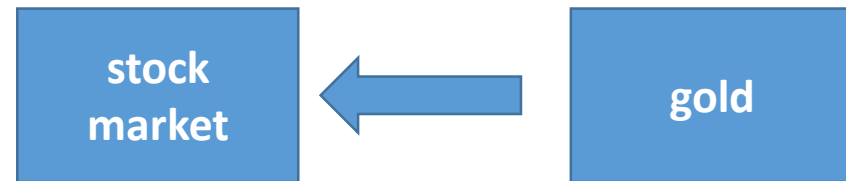


Contribution (2)

Most of the existing literature



This paper



Outline

- Methodology
- Data
- Empirical Analysis/ Estimation Results
- Summary and Concluding Remarks



Methodology

$$R_{i,t} = a + b_M R_{\text{Market},t} + b_W R_{\text{MSCIWorld},t} + b_G R_{\text{Gold},t} + e_{i,t}$$



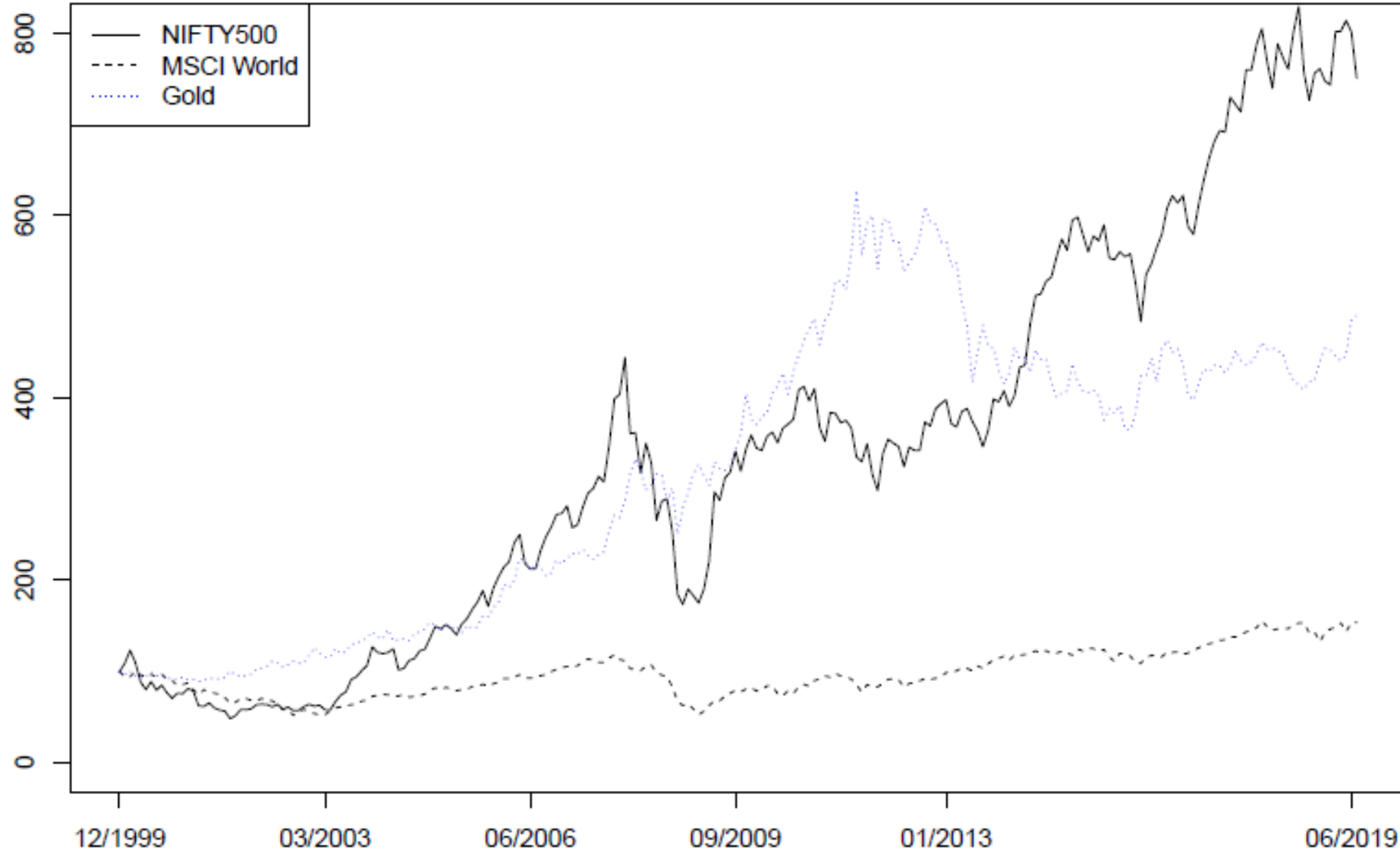
- Example: if a higher price of gold leads to a higher share price of firms in the retail sector we assume that the underlying cause is improved consumer sentiment potentially through a “wealth effect” due to the rise in the price of gold.
- Sorting of gold beta estimates and analysis of top 5 and bottom 5 gold betas out of 100 sectors or 500 firms
- Additional analysis: time-varying differences and quantile-dependent differences (Quantile Regression)
- Quantile Regression

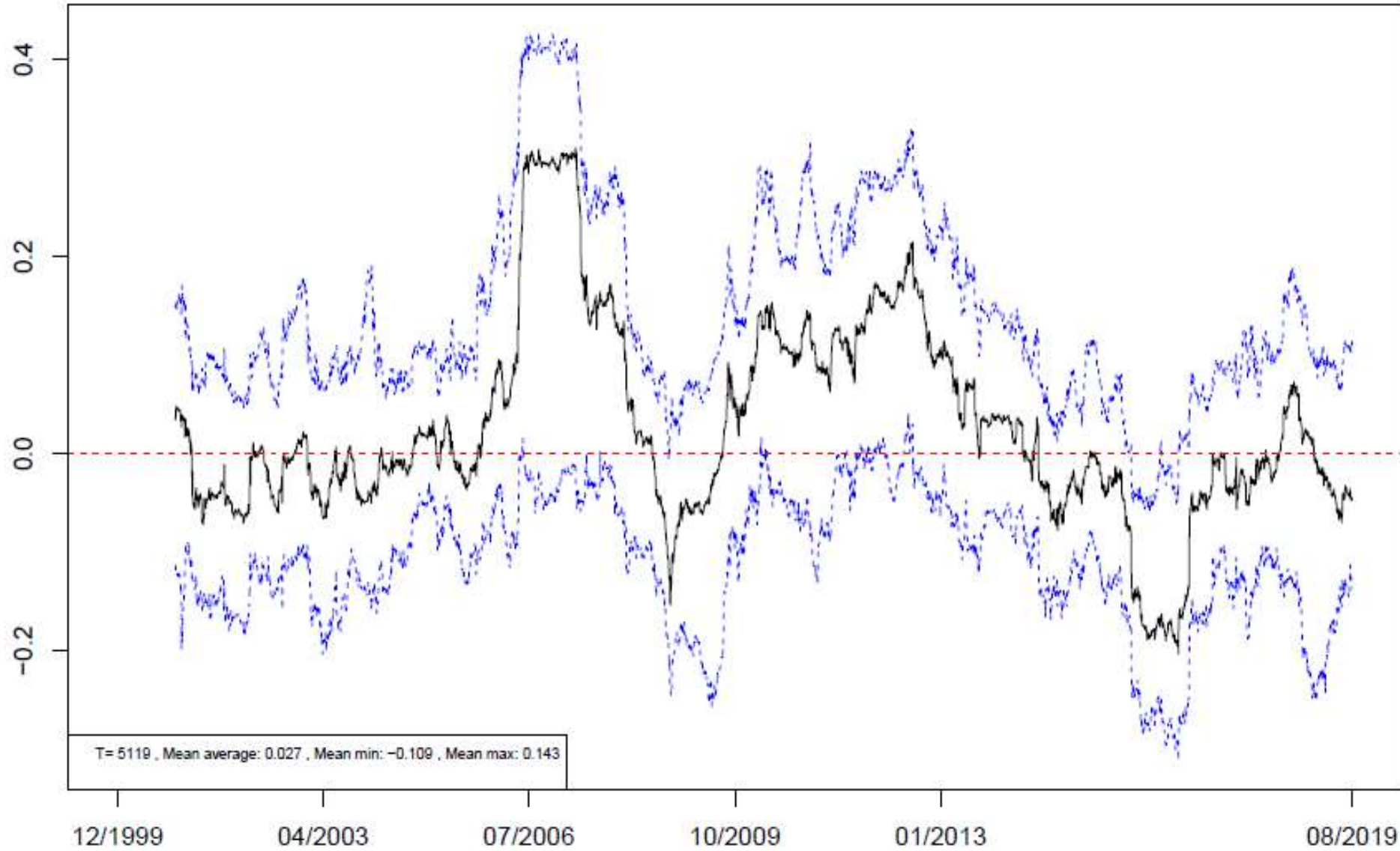
$$Q(R_{i,t} | \tau) = a(\tau) + b_M(\tau) R_{\text{Market},t} + b_W(\tau) R_{\text{MSCIWorld},t} + b_G(\tau) R_{\text{Gold},t} + e_{i,t}$$

Data

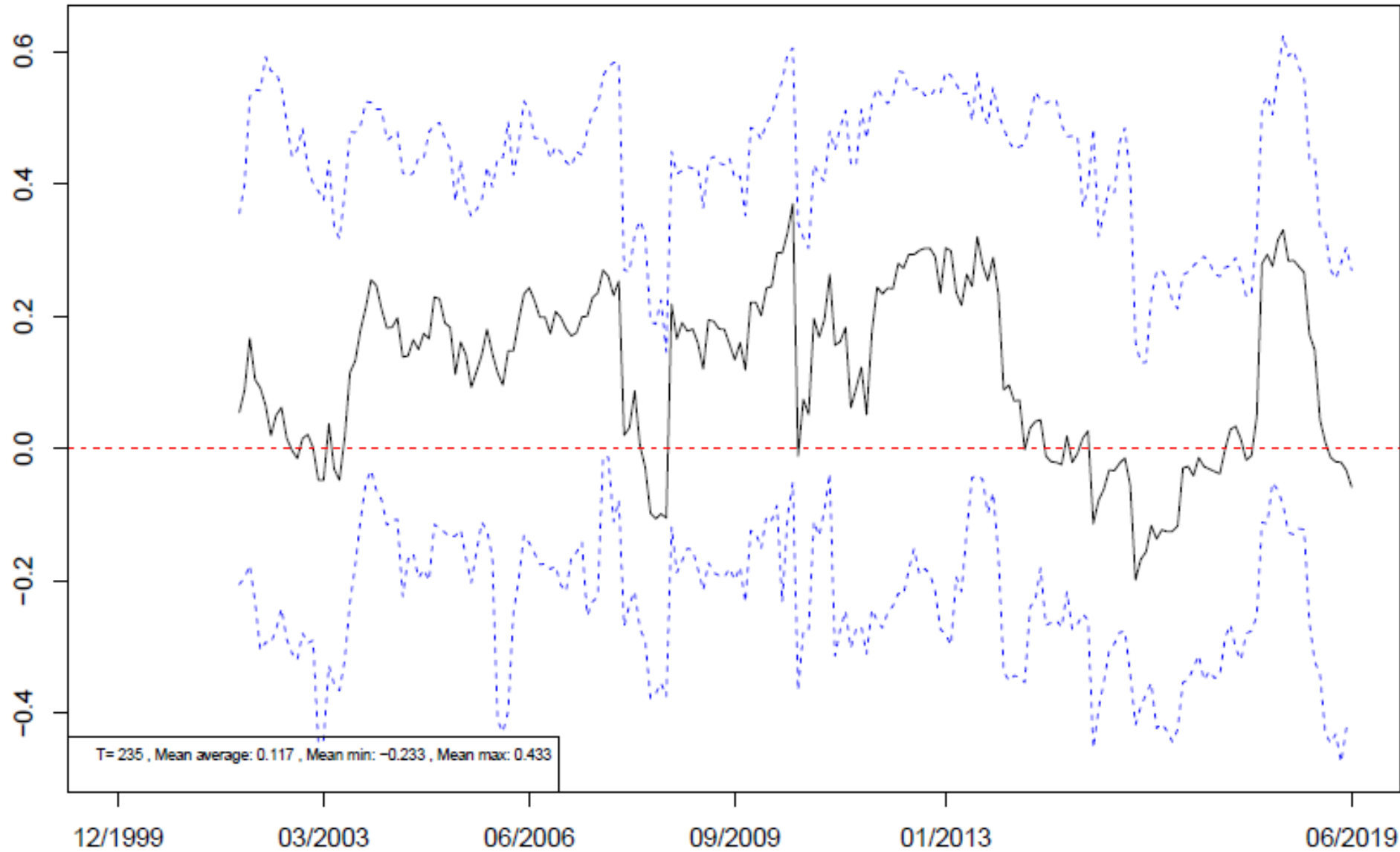
- Thomson Reuters DataStream Sector indices (100 sectors) and stock market index constituent lists (500 firms) for the period January 1, 2000 to July 31, 2019 at daily, weekly and monthly frequencies.



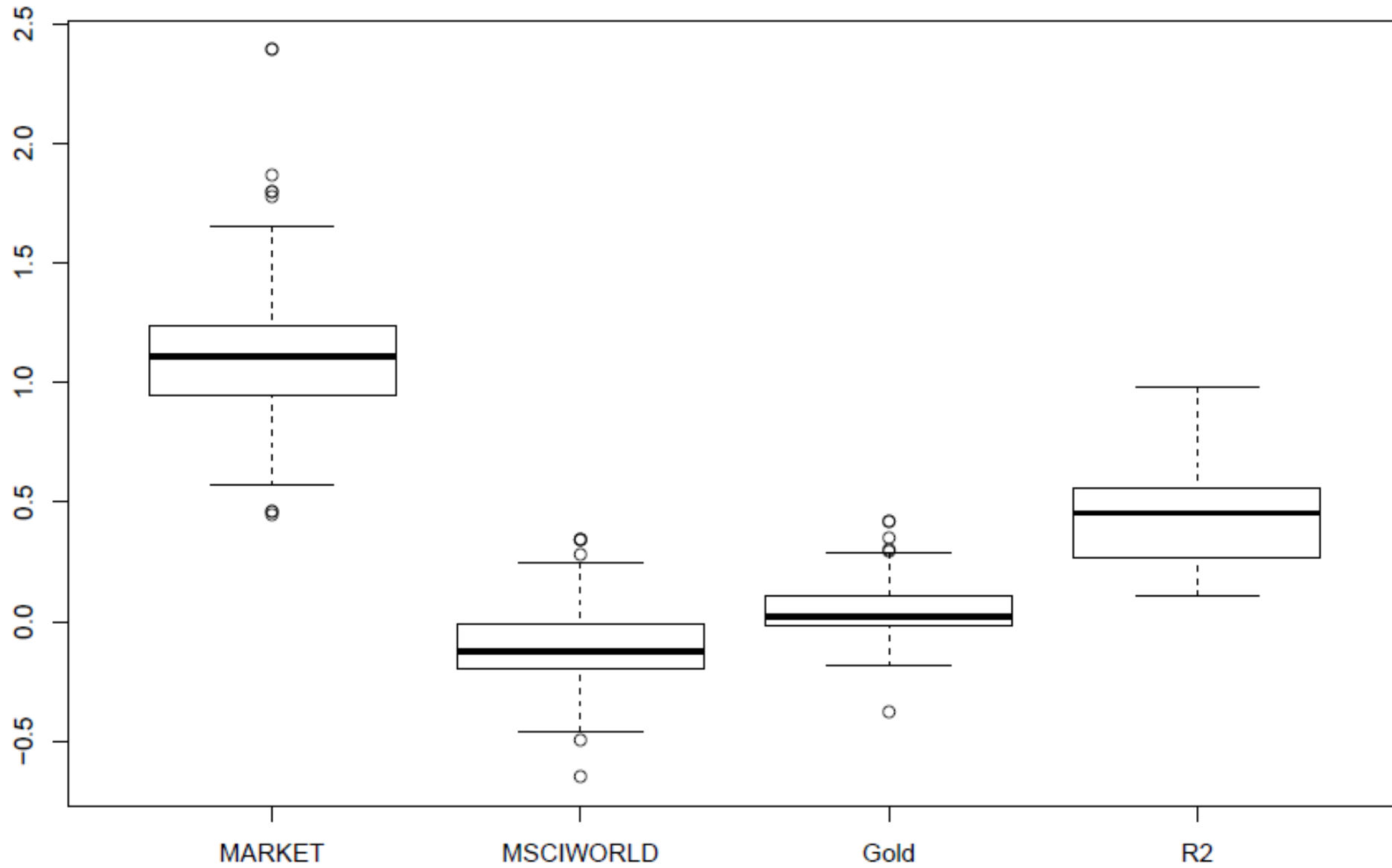




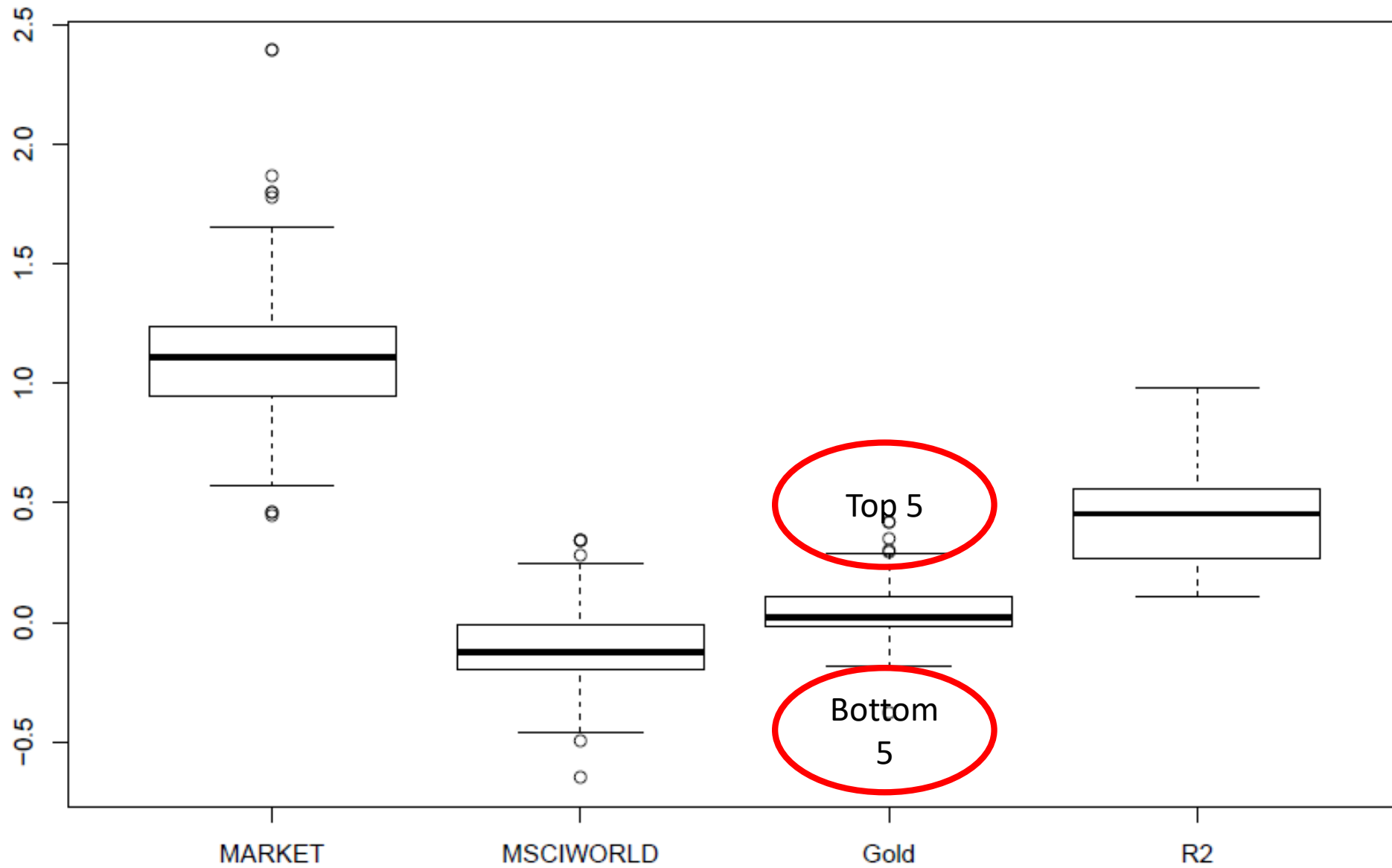
**Average
dynamic
correlations of
sectors based
on daily data**



**Average
dynamic
correlations of
sectors based
on monthly
data**



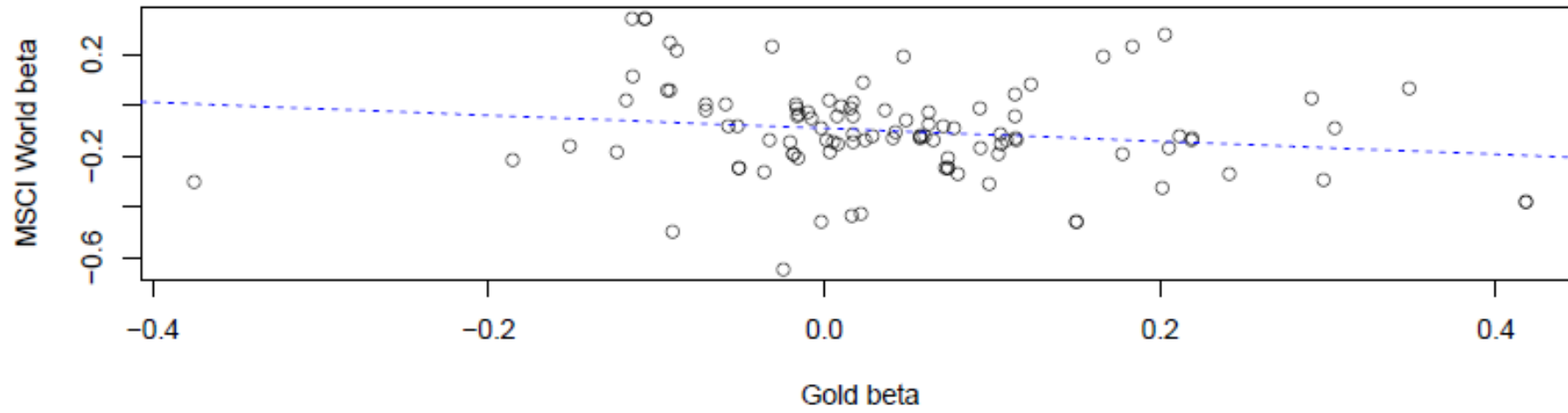
**Sectors,
monthly data**



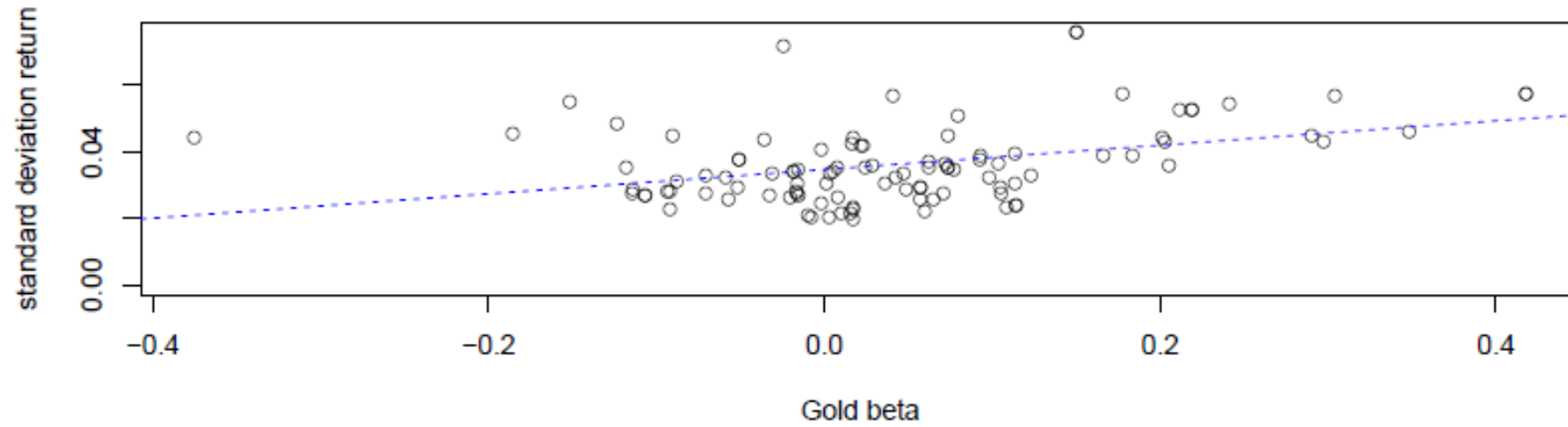
Sectors,
monthly data



$R^2 = 0.03$



$R^2 = 0.15$



Top 5 Sectors



Dependent variable:

	Rest...Bars	Nonferrous.Met	India General.Min	Retail	Broadline.Rtl
	(1)	(2)	(3)	(4)	(5)
market	1.102*** (0.259)	0.972*** (0.088)	1.292*** (0.138)	1.500*** (0.445)	1.643*** (0.467)
worldm	0.222 (0.296)	0.493*** (0.144)	0.064 (0.225)	-0.499 (0.517)	-0.567 (0.543)
gold	0.242 (0.219)	0.256** (0.112)	0.358** (0.175)	1.874*** (0.559)	1.881*** (0.587)
Constant	0.013 (0.010)	0.0003 (0.005)	-0.004 (0.008)	0.024 (0.017)	0.019 (0.018)
Observations	113	235	235	35	35
R ²	0.216	0.560	0.402	0.450	0.450
Adjusted R ²	0.194	0.554	0.394	0.397	0.397
Residual Std. Error	0.106 (df = 109)	0.079 (df = 231)	0.124 (df = 231)	0.097 (df = 31)	0.101 (df = 31)
F Statistic	10.007*** (df = 3; 109)	97.976*** (df = 3; 231)	51.734*** (df = 3; 231)	8.450*** (df = 3; 31)	8.464*** (df = 3; 31)

Note:

*p<0.1; **p<0.05; ***p<0.01

Bottom 5 Sectors



<i>Dependent variable:</i>					
	India				
	Support.Svs	Fxd.Line.T.Cm	S.W...Comp.Svs	Technology	Computer.Svs
	(1)	(2)	(3)	(4)	(5)
market	2.550** (0.860)	0.662*** (0.150)	0.770*** (0.083)	0.774*** (0.083)	0.837*** (0.090)
worldm	-0.430 (0.549)	0.314 (0.246)	0.305** (0.136)	0.304** (0.136)	0.197 (0.147)
gold	-0.442 (0.927)	-0.326* (0.192)	-0.261** (0.106)	-0.259** (0.106)	-0.252** (0.114)
Constant	0.069 (0.033)	-0.005 (0.009)	0.002 (0.005)	0.002 (0.005)	0.002 (0.005)
Observations	8	235	235	235	235
R ²	0.766	0.151	0.424	0.426	0.399
Adjusted R ²	0.590	0.140	0.417	0.419	0.391
Residual Std. Error	0.078 (df = 4)	0.135 (df = 231)	0.075 (df = 231)	0.075 (df = 231)	0.081 (df = 231)
F Statistic	4.359* (df = 3; 4)	13.690*** (df = 3; 231)	56.732*** (df = 3; 231)	57.173*** (df = 3; 231)	51.092*** (df = 3; 231)

Note:

*p<0.1; **p<0.05; ***p<0.01

Top 5 Firms



	<i>Dependent variable:</i>				
	NIFTY500				
	PC.JEWELLER	ALLCARGO.LOGISTICS	SHREE.RENUKA.SUGARS	MANAPPURAM.FINANCE	MUTHOOT.FINANCE
	(1)	(2)	(3)	(4)	(5)
market	1.666*** (0.573)	0.862*** (0.188)	1.451*** (0.207)	0.753*** (0.268)	1.293*** (0.263)
worldm	-0.101 (0.739)	0.006 (0.279)	0.170 (0.313)	-0.127 (0.409)	-0.883*** (0.335)
gold	0.560 (0.520)	0.568*** (0.196)	0.761*** (0.214)	0.815*** (0.278)	1.028*** (0.224)
Constant	-0.022 (0.022)	-0.008 (0.010)	-0.022** (0.011)	0.014 (0.014)	0.009 (0.010)
Observations	79	157	165	167	98
R ²	0.122	0.249	0.428	0.132	0.323
Adjusted R ²	0.087	0.234	0.417	0.116	0.301
Residual Std. Error	0.194 (df = 75)	0.121 (df = 153)	0.136 (df = 161)	0.178 (df = 163)	0.102 (df = 94)
F Statistic	3.472** (df = 3; 75)	16.875*** (df = 3; 153)	40.164*** (df = 3; 161)	8.252*** (df = 3; 163)	14.954*** (df = 3; 94)

Note:

*p<0.1; **p<0.05; ***p<0.01

Bottom 5 Firms



	<i>Dependent variable:</i>				
	MINDA.CORPORATION	GATEWAY.DISTRI PARKS	NIFTY 500 NBCC..INDIA.	GRINDWELL.NORTON	STRIDES.PHARMA.SCIENCE
	(1)	(2)	(3)	(4)	(5)
market	-0.366 (0.778)	1.205*** (0.141)	2.076*** (0.308)	0.527*** (0.153)	1.141*** (0.146)
worldm	1.433 (1.024)	-0.150 (0.216)	-1.164*** (0.394)	-0.004 (0.252)	-0.168 (0.239)
gold	-0.976 (0.712)	-0.511*** (0.146)	-0.433 (0.281)	-0.423** (0.196)	-0.418** (0.183)
Constant	-0.001 (0.031)	-0.006 (0.007)	0.010 (0.012)	0.014 (0.009)	-0.003 (0.009)
Observations	91	172	87	235	233
R ²	0.039	0.407	0.368	0.078	0.269
Adjusted R ²	0.006	0.396	0.345	0.066	0.260
Residual Std. Error	0.284 (df = 87)	0.094 (df = 168)	0.108 (df = 83)	0.138 (df = 231)	0.129 (df = 229)
F Statistic	1.188 (df = 3; 87)	38.366*** (df = 3; 168)	16.130*** (df = 3; 83)	6.509*** (df = 3; 231)	28.148*** (df = 3; 229)

Note:

*p<0.1; **p<0.05; ***p<0.01

Top 5 Firms, daily returns



Dependent variable:

	NATIONAL.ALUMINIUM (1)	MUTHOOT.FINANCE (2)	ADVANCED.ENZYME.TECHS. (3)	ENDURANCE.TECHNOLOGIES (4)	PC.JEWELLER (5)
market	0.908*** (0.026)	1.031*** (0.059)	1.111*** (0.111)	0.670*** (0.104)	1.250*** (0.116)
worldm	-0.027 (0.037)	-0.174*** (0.067)	-0.157 (0.136)	-0.029 (0.126)	0.023 (0.149)
gold	0.129*** (0.032)	0.175*** (0.052)	0.191 (0.122)	0.192* (0.114)	0.218** (0.106)
Constant	-0.0002 (0.0003)	0.0003 (0.001)	-0.001 (0.001)	0.0002 (0.001)	-0.001 (0.001)
Observations	5,119	2,159	793	736	1,730
R ²	0.214	0.134	0.117	0.059	0.072
Adjusted R ²	0.213	0.132	0.113	0.055	0.071
Residual Std. Error	0.025 (df = 5115)	0.023 (df = 2155)	0.023 (df = 789)	0.021 (df = 732)	0.040 (df = 1726)
F Statistic	463.891*** (df = 3; 5115)	110.826*** (df = 3; 2155)	34.699*** (df = 3; 789)	15.195*** (df = 3; 732)	44.915*** (df = 3; 1726)

Note:

*p<0.1; **p<0.05; ***p<0.01

Top 5 Sectors WORLD ex US



Dependent variable:

WORLD ex US

	Nonferrous.Met	Basic.Resource	Mining	Plat.Prec.Met	Gold.Mining
	(1)	(2)	(3)	(4)	(5)

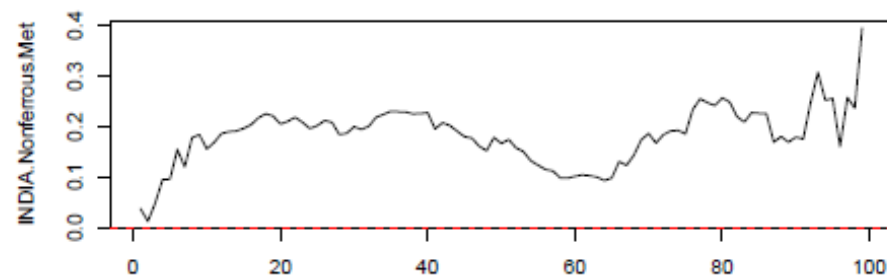
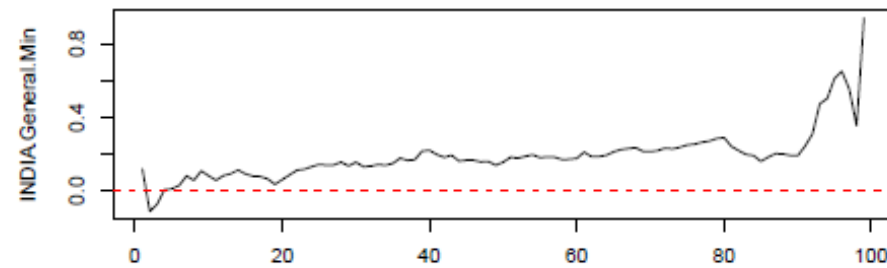
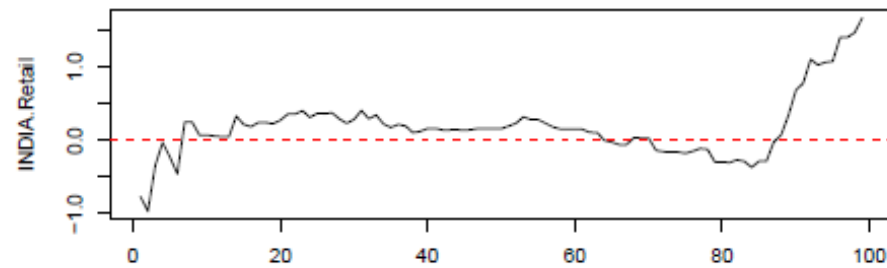
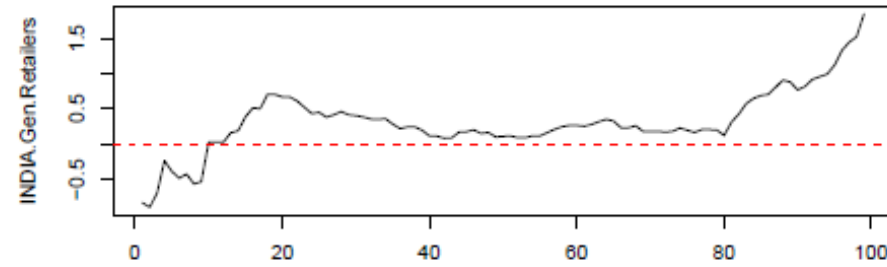
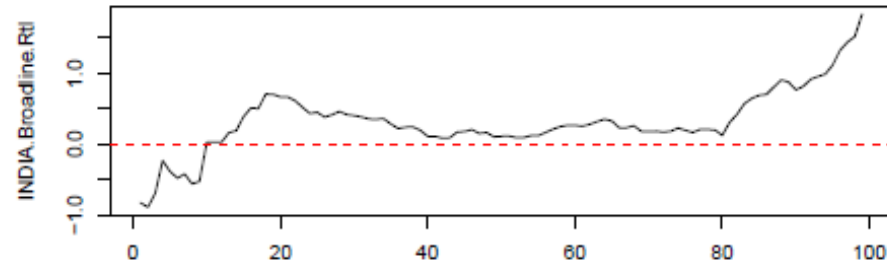
worldm	1.471*** (0.078)	1.242*** (0.066)	1.152*** (0.076)	1.266*** (0.113)	0.368*** (0.083)
gold	0.531*** (0.073)	0.584*** (0.062)	0.799*** (0.071)	1.313*** (0.106)	1.735*** (0.078)
Constant	-0.003 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.007 (0.005)	-0.009** (0.004)
Observations	235	235	235	235	235
R ²	0.656	0.677	0.632	0.573	0.701
Adjusted R ²	0.653	0.675	0.628	0.570	0.698
Residual Std. Error (df = 232)	0.052	0.044	0.051	0.076	0.056
F Statistic (df = 2; 232)	221.036***	243.651***	198.846***	155.844***	271.499***

Bottom 5 Sectors WORLD ex US



	<i>Dependent variable:</i>				
	WORLD ex US				
	Eltro.Off.Eq	Semiconductors	Automobiles	Aerospace	Auto...Parts
	(1)	(2)	(3)	(4)	(5)
worldm	0.795*** (0.063)	1.358*** (0.077)	0.996*** (0.057)	1.217*** (0.061)	0.993*** (0.051)
gold	-0.139** (0.059)	-0.135* (0.072)	-0.124** (0.054)	-0.101* (0.057)	-0.092* (0.047)
Constant	0.0002 (0.003)	-0.001 (0.003)	0.001 (0.003)	0.005* (0.003)	0.001 (0.002)
Observations	235	235	235	235	235
R ²	0.407	0.570	0.566	0.635	0.623
Adjusted R ²	0.402	0.567	0.562	0.632	0.620
Residual Std. Error (df = 232)	0.042	0.052	0.038	0.041	0.034
F Statistic (df = 2; 232)	79.586***	154.071***	151.005***	201.696***	191.764***

Asymmetries in gold betas – monthly returns, Quantile Regression



Summary



- This paper analyzes the role of gold from a firm/ sector financial perspective
- Some Indian firms display an unusual (unique) positive exposure to the price of gold
 - Retail sector: if the price of gold increases consumer sentiment becomes more positive due to a “golden” wealth effect and positively affects the business of firms in the retail sector.
 - Retail finance: gold used as collateral
 - Asymmetry: link between share prices and gold prices is stronger if share prices go up than if they go down

Concluding Remarks

- The results illustrate that gold's role is much broader and deeper than suggested by the ubiquitous references to “culture”.
- Relatively stable gold betas over time suggests that gold's role has not significantly changed despite globalization and attempts by the Indian government to change the role of gold.



Thank you..

Appendix



	<i>Dependent variable:</i>				
	Ind..Met...Mines (1)	Basic. Mats (2)	Turkey Basic.Resource (3)	Support.Svs (4)	Gold.Mining (5)
market	0.810*** (0.069)	0.759*** (0.055)	0.825*** (0.067)	0.964*** (0.185)	0.687*** (0.210)
worldm	0.339** (0.153)	0.269** (0.121)	0.282* (0.147)	-0.098 (0.336)	-0.151 (0.325)
gold	0.223* (0.122)	0.236** (0.097)	0.368*** (0.118)	0.606** (0.246)	1.354*** (0.245)
Constant	0.006 (0.006)	0.005 (0.005)	0.004 (0.006)	0.002 (0.012)	0.006 (0.011)
Observations	235	235	235	197	113
R ²	0.504	0.581	0.530	0.193	0.305
Adjusted R ²	0.498	0.576	0.524	0.181	0.285
Residual Std. Error	0.087 (df = 231)	0.069 (df = 231)	0.084 (df = 231)	0.167 (df = 193)	0.118 (df = 109)
F Statistic	78.358*** (df = 3; 231)	106.785*** (df = 3; 231)	86.878*** (df = 3; 231)	15.390*** (df = 3; 193)	15.912*** (df = 3; 109)