

Does finance benefit society? a language embedding approach

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Motivation

“As finance academics, we should care deeply about the way the financial industry is perceived by society. Not so much because this affects our own reputation, but because there might be some truth in all these criticisms, truths we cannot see because we are too embedded in our own world. And even if we thought there were no truth, we should care about the effects that this reputation has in shaping regulation and government intervention in the financial industry. Last but not least, we should care because the positive role that finance can play in society depends on the public’s perception of our industry.” Zingales (2015, AFA presidential address)

Questions

- ▶ How positive is popular sentiment toward finance across countries and time?
- ▶ Does public attitude towards finance affect economic activity?

Our paper

- ▶ Measure popular sentiment toward finance in an annual panel
 - ▶ 8 large economies matched to languages from 1870–2009
 - ▶ Computational linguistics approach applied to the text of millions of books
- ▶ Finding
 - ▶ Persistent differences across languages/countries with ample time-series variation
 - ▶ Declines in finance sentiment precede major economic crises
 - ▶ Controlling for lagged GDP and credit growth, and for country fixed effects, finance sentiment growth is positively associated with future GDP growth

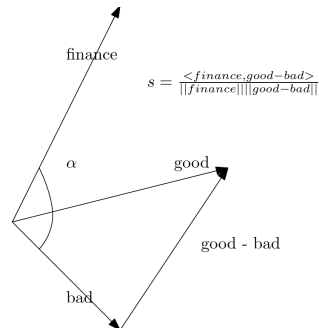
Data

- ▶ Text from Google Books corpus
 - ▶ Annual n-gram counts 1870–2009
 - ▶ 8 languages: CN, DE, FR, GB, IT, RU, SP, and US
- ▶ Macro data
 - ▶ Jorda-Schularick-Taylor macro data for advanced economies
 - ▶ Barro-Ursua macro data for Russia and China

Measure of finance sentiment

1. Embed each “finance” mentioning 5-gram in a 700 dimensional vector
2. Project these vector embeddings on the positivity dimension defined by good minus bad embeddings (Evans, Kozlowski, Taddy, 2018)

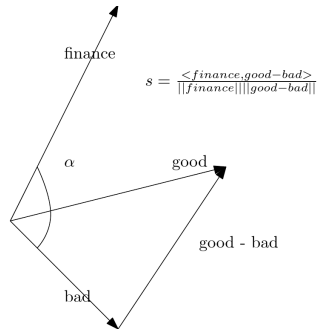
<i>good</i>	<i>bad</i>
finance is good for society	finance is bad for society
finance professionals are mostly good people	finance professionals are mostly corrupt people
finance positively impacts our world	finance negatively impacts our world
financial system helps the economy	financial system hurts the economy
financial services benefit society	financial services damage society



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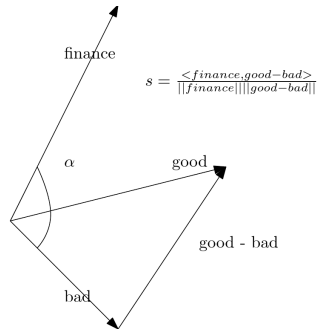
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Top n-grams for US English

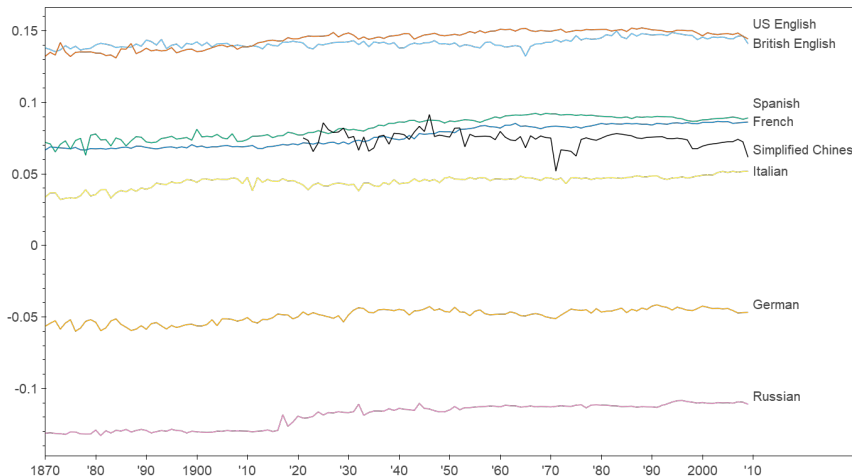
Positive	Negative
the goal of financial management	turmoil in the financial markets
finance in the graduate school	finances become disordered the
financial support of the center	financial panic swept the country
financial management of the organization	turmoil in financial markets
business and financial experience	financial panic swept the nation
financial support of the graduate	instability in the financial markets
financial support of the science	financial panic in the country
financial support of the course	severe financial setbacks
financial support of the field	a major financial panic
knowledge of the financial structure	world wide financial panic

Top n-grams for Chinese

Positive	Negative
经济发展 提供 金融(economic development offer finance)	严重 扰乱 了 金融 秩序(profoundly turmoil financial order)
农村 发展 提供 金融(rural development offer finance)	扰乱 了 国家 金融 秩序(turmoil national financial order)
金融 推动 发展(finance promote development)	严重 扰乱 了 金融(profoundly turmoil finance)
金融 服务 促进 农村(financial service promote village)	扰乱 了 正常 的 金融(turmoil formal finance)
金融 务 促进(financial service promote)	扰乱 了 金融 秩 序(turmoil financial order)
服务 促进 金融(service promote finance)	扰乱 了 金融 秩序(turmoil financial order)
金融 立足(finance base on)	扰乱 了 金融 市场(turmoil financial market)
服务 农村 金融(service village finance)	干 扰 了 金 融 秩 序(obstruct national financial order)
金融 服务 社会(finance service to society)	既 不 利 于 金 融(and be bad for finance)
服务 规范 发展 金融(service specification develop finance)	扰乱 了 金融 序(turmoil financial market)

Sentiment toward finance 1870–2009

Persistent differences across languages/countries with ample variation



Financial crisis prediction

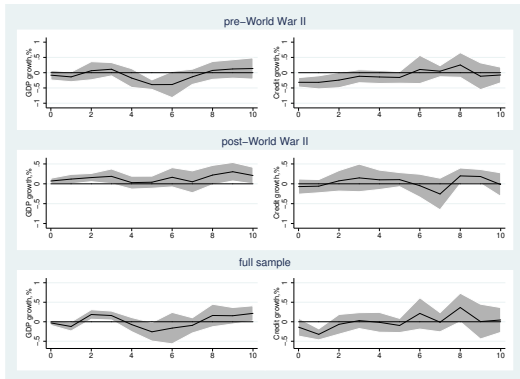
logistic panel regression with fixed effects	full sample		pre-World War II		post-World War II	
	(1)	(2)	(3)	(4)	(5)	(6)
	crisis					
L. finance sentiment growth	0.020 (0.061)	0.004 (0.065)	0.047 (0.062)	0.064 (0.070)	-0.299 (0.192)	-0.337* (0.196)
L2. finance sentiment growth	0.086 (0.071)	0.102 (0.078)	0.106 (0.073)	0.127 (0.083)	-0.495* (0.264)	-0.564** (0.280)
L3. finance sentiment growth	0.057 (0.070)	0.058 (0.079)	0.042 (0.073)	0.046 (0.084)	0.083 (0.215)	0.135 (0.219)
L4. finance sentiment growth	-0.015 (0.066)	-0.015 (0.076)	-0.035 (0.066)	-0.020 (0.077)	0.058 (0.217)	0.098 (0.216)
L5. finance sentiment growth	-0.128** (0.064)	-0.085 (0.073)	-0.158** (0.066)	-0.106 (0.076)	0.278 (0.178)	0.304 (0.189)
L.credit growth		-0.008 (0.021)		0.005 (0.027)		0.019 (0.064)
L2.credit growth		0.062*** (0.014)		0.090*** (0.023)		0.032 (0.066)
L3.credit growth		-0.018 (0.017)		0.019 (0.035)		0.036 (0.055)
L4.credit growth		0.012 (0.016)		-0.006 (0.027)		-0.047 (0.064)
L5.credit growth		0.003 (0.015)		0.001 (0.023)		-0.022 (0.054)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	804	679	420	313	348	348

Note: (1) *** $p < 1\%$, ** $p < 5\%$, * $p < 10\%$; (2) standard errors in parentheses.

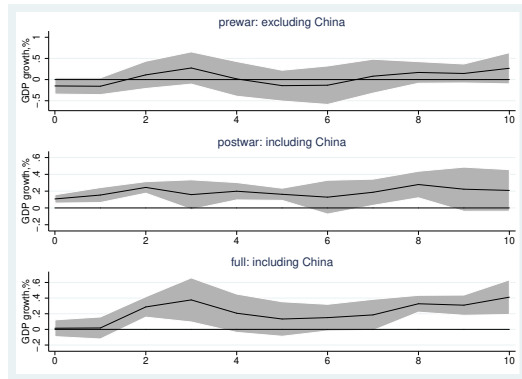
Local projections for GDP and credit growth

Finance sentiment shock is followed by higher future GDP growth. Mixed results on credit growth. Stronger results when including China.

Without China and Russia



With China and Russia



Conclusion

- ▶ Books written in languages of more capitalist countries place finance in a more positive context on average.
- ▶ Sentiment toward finance changes considerably over time and mean reverts.
- ▶ Declines in finance sentiment precede major economic crises including the Great Depression.
- ▶ Controlling for lagged GDP and credit growth, and for country fixed effects, finance sentiment growth is positively associated with future GDP and credit growth.