文献导读（二）：疫情政策指数研究

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议题 Topics

1. 研究背景
2. 数据
3. 方法
4. 结果解读
5. 总结与讨论

研究背景

- 2020年初,新冠肺炎疫情不仅造成民众身体健康的伤害,也给中国以及全球经济经济带来巨大挑战（中国一季度经济下滑明显；全球产业链和供应链受到冲击，服务业和小微私营企业受严重影响）(Wang & Wu, 2020)

- 过往研究建议为缓解疫情给中国及全球经济带来的不利影响, 应通过短期刺激政策给予个体经营者及小微企业更多扶持（Qin & Li, 2020)

- 顺应经济需求，各国相继推出经济刺激政策
  - 美国：降息至零利率，两万亿美元财政刺激计划
  - 英国：免除企业12个月营业税
  - 日本：推出56万亿日元的经济刺激方案

- 研究目标：
  - 量化166个国家的经济刺激政策，开发构建每个国家的2019冠状病毒经济刺激指数(COVID-19 Economic Stimulus Index; CESI)
  - 调查国家特征的变量与经济措施数量的相关性

研究数据

- 国际货币基金组织提供初始数据(IMF COVID-19 Policy Tracker, 2020).
- 多种渠道交叉检验及修正(3月31号，2020)
- 数据细分成三个大类 (财政，货币，汇率)
- 网上收集公共卫生政策以及疫情相关的变量 (每千人平均床位，公共卫生支出：World Bank)

研究方法

- **2019冠状病毒经济刺激指数计算**
  - 主成分分析

- **经济政策包数据库包含三个大类，六个政策变量（图1）**
  - 其中财政刺激政策和利率消减占最大比重

- **调查国家特征，与流行病相关的变量，公共措施跟经济政策的关系**
  - 回归分析 （相关性）
  - 人均年龄
  - 人均GDP
  - 感染率
  - 每千人平均床位
  - 公共卫生支出
  - 政府政策响应指数

图1

经济刺激政策分类					
财政政策	货币政策			国际收支（balance of payment）和汇率政策	
（编码为）GDP百分比	货币政策管理局降息（2月1号利率的百分比）	大型经济救助法案（GDP百分比）	其他（有或没有）	特定的BoP措施（GPD百分比）	其他（有或没有）

结果解读

- **经济刺激指数：**
  - 概括性数据（Table1）
  - 全球经济刺激指数呈右偏态分布 （Figure 1）
    - 一些国家推出了大量利息消减和财政政策
    - 同时很多国家至今还没有推出相关经济刺激政策

Figure 1: The COVID-19 Economic Stimulus Index (CESI): Histogram and Cumulative Distribution

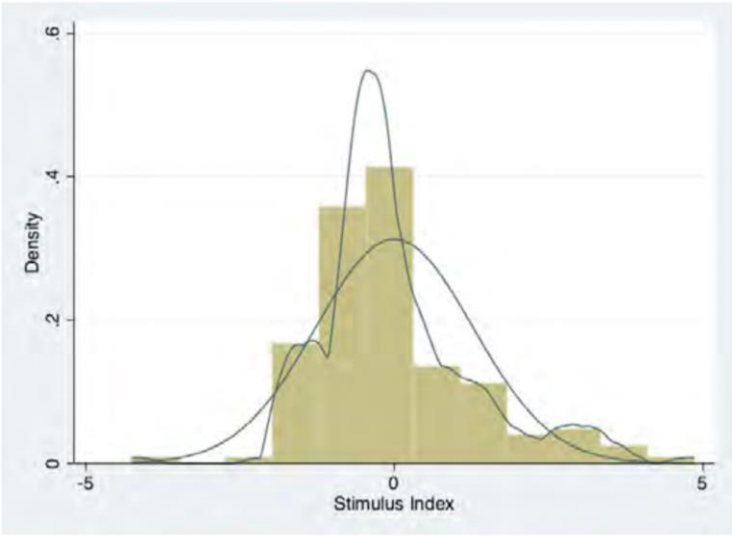

Table 1: Summary Statistics of the Dataset

	Mean	Median	Std. Dev.	Min	Max
COVID-19 Economic Stimulus Index(CESI)	0.00	-0.31	1.28	-4.25	4.85
Fiscal Policy Stimulus (%)	2.09	0.48	3.60	-7.20	17.80
Interest Rate Cut (%)	11.63	0.00	21.47	-29.73	100.00
Macro-Financial Package (% of GDP)	1.87	0.00	4.02	0.00	26.00
Other Monetary Measures(0-1 dummy)	0.85	1.00	0.36	0.00	1.00
BoP Measures (% GDP)	0.10	0.00	0.58	0.00	6.00
Other BoP Measure (0-1 dummy)	0.19	0.00	0.40	0.00	1.00

结果解读

- **经济政策刺激指数和国家特质的相关性分析（Table 2）：**
- 经济政策较多的国家通常：
  - 平均年龄大
  - 千人平均床位少
  - 感染率高（案例多）
  - 人均GDP高

- 疫情越严重，国家越富裕，经济政策推行得越多

- 经济政策的推动是为了应对疫情的影响，与减轻疫情相关政策没有关联

Table 2: Cross-Country OLS Regressions

Dep. Var.	CESI	CESI	CESI	CESI	CESI	CESI	CESI
Median Age	0.07*	0.10*	0.09*	0.09*	0.06*	0.05*	0.05*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Hospital Beds (per-capita)		-0.15*	-0.13*	-0.12**	-0.11*	-0.11*	-0.11*
		(0.04)	(0.04)	(0.04)	(0.06)	(0.04)	(0.04)
Infection Rate (%)			546.25*	224.83	-69.56	-149.34	-151.30
			(211.49)	(237.44)	(196.50)	(220.96)	(225.97)
Stringency Index				0.004			
				(0.006)			
GDP per-capita (000 USD)					0.03*	0.03*	0.03*
					(0.001)	(0.001)	(0.001)
Total Cases						0.007**	0.008**
						(0.003)	(0.004)
Health Expenditures (% GDP)							-0.03
							(0.04)
R-squared	0.27	0.31	0.34	0.30	0.43	0.43	0.43
Observations	146	146	143	69	140	140	139
F-Test	0.00	0.00	0.00	0.00	0.00	0.00	0.00

All regressions include a constant. Robust standard errors are reported in parentheses. *, **, *** denote 1, 5 and 10% confidence levels, respectively.

总结与讨论

- **研究总结：**
  - 量化了166个国家的相关经济政策
  - 生成了经济刺激指数
  - 研究了国家特质对经济政策的影响

- **与以往研究的不同之处：**
  - 调查了与国家级别变量的相关性，评估相关变量对经济政策推行的影响

总结与讨论（个人思考）

- **本文研究的通用之处：**
  - 其他种类的政策指数开发：公共卫生政策，技术政策
  - 其他领域的指数构建：生活质量指数；股票市场反应指数
  - 政策指数与变量的相关性：公众焦虑感

- **本文研究的局限与扩展：**
  - 局限：
    - 调查的变量较少（比如可以调查人口密度与经济刺激指数的相关性）
    - 只关注政策推行的数量
    - 国家层级的政策
  - 未来方向：
    - 经济政策有效性（民众对于政府的信心，股市变化）
    - 研究每个地区，每个省或者每个郡的经济政策变化，以及与各地区特性的相关性

美国停工以及重启的政策数据：

https://covid-19.stcenter.net/

https://github.com/stccenter/COVID-19-Data/tree/master/Policy/US_Policy

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点评

- Weekly updated data: www.ceyhunelgin.com (May 10th, 2020)
- IMF policy tracker: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#S

Regression Specification

- Country features:
  - GDP per capita
  - Oil producing country
  - Gov response (stringency index)
  - Population size and density
  - Age structure
  - Testing capacity, Contact tracing
  - hospital beds per 1,000 pop
  - IUC beds per 1,000 pop
  - Vaccine development
  - Mortality rate

Methods

- PCA
- Structural equation modeling
- Factor analysis

Limitations

- Cross-sectional data
- Panel data
- Spatio-temporal analysis

Dep. Var.	CESI	CESI	CESI	CESI	CESI	CESI	CESI
Median Age	0.07*	0.10*	0.09*	0.09*	0.06*	0.05*	0.05*
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Oxford COVID-19 Government Response tracker (OxCGRT)

Background

- Policies regarding to the COVID-19 emergency differed from each country. In order to better compare and understand the robustness of governmental policies across countries, the Blavatnik School of Government at University of Oxford has developed a "stringency index". This tool aims to track and compare policy responses around the world, rigorously and consistently.
- The OxCGRT includes closure and containment (C1-C8), economic response (E1-E4), Public health/health system (H1-H5) and miscellaneous (M1) eighteen indicators so far.

Stringent Index

- Closures and Containment: C1-school closing, C2-workplace closing, C3-cancel public events, C4 -restrictions on gathering size, C5-close public transport, C6- “shelter-in-place” and home confinement orders, C7- restrictions on internal movement, C8-restrictions on international travel
- Economic response: E1-income support, E2-debt/contract relief for households, E3-fiscal measures, E4-giving international support
- Public health/health system: H1-public information campaign, H2-testing policy, H3-contact tracing, H4-emergency investment in healthcare, H5-investment in Covid-19 vaccines
- Miscellaneous: M1-Other responses

Research data

- Data source: https://data.humdata.org/dataset/oxford-covid-19-government-response-tracker
- Data is collected from publicly available sources such as news articles and government press releases and briefings. These are identified via internet searches by a team of several dozen Oxford University students and staff.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	CountryNam	CountryCode	Date	C1_School cl	C1_Flag	C1_Notes	C2_Workplac	C2_Flag	C2_Notes	C3_Cancel pu	C3_Flag	C3_Notes	C4_Restrictic	C4_Flag	C4_Notes	C5_Close pul	C5_Flag	C5_Notes	C6_Stay at h
2	Aruba	ABW	20200101	0			0			0			0			0			0
3	Aruba	ABW	20200102	0			0			0			0			0			0
4	Aruba	ABW	20200103	0			0			0			0			0			0
5	Aruba	ABW	20200104	0			0			0			0			0			0
6	Aruba	ABW	20200105	0			0			0			0			0			0
7	Aruba	ABW	20200106	0			0			0			0			0			0
143	Afghanistan	AFG	20200101	0		https://en.ur	0		Form Januar	0			0			0		Prior to Marc	0
144	Afghanistan	AFG	20200102	0			0			0			0			0			0
145	Afghanistan	AFG	20200103	0			0			0			0			0			0
146	Afghanistan	AFG	20200104	0			0			0			0			0			0
147	Afghanistan	AFG	20200105	0			0			0			0			0			0
148	Afghanistan	AFG	20200106	0			0			0			0			0			0
149	Afghanistan	AFG	20200107	0			0			0			0			0			0
150	Afghanistan	AFG	20200108	0			0			0			0			0			0

Detailed Description of Indicators

- C1: 0-No measures 1-recommend closing 2- Require closing (only some levels or categories) 3-Require closing all levels; No data-blank
- C2: 0 - No 1-recommend closing (or work from home) 2-require closing (or work from home) for some sectors or categories of workers 3-require closing (or work from home) all-but essential workplaces; No data-blank
- C3: 0-No 1-Recommend cancelling 2-Require cancelling; No data-blank
- C4: 0-No 1-Restrictions on very large gatherings (the limit is above 1000 people) 2-Restrictions on gatherings between 100-1000 people 3-Restrictions on gatherings between 10-100 people 4-Restrictions on gatherings of less than 10 people; No data-blank
- C5: 0-No 1-Recommend closing (or significantly reduce volume/route/means of transport available) 2-Require closing (or prohibit most citizens from using it)
- H1:0-No 1 - public officials urging caution about COVID-19 - coordinated public information campaign; No data-blank
- C6:0 -No 1-recommend not leaving house 2-require not leaving house with exceptions for daily exercise, grocery shopping, and 'essential' trips 3-Require not leaving house with minimal exceptions; No data-blank

Detailed Description of Indicators

- C7: 0-No 1-Recommend closing (or significantly reduce volume/route/means of transport) 2-Require closing (or prohibit most people from using it)
- C8: 0-No 1-Screening 2-Quarantine arrivals from high-risk regions 3-Ban on high-risk regions 4-Total border closure; No data-blank
- E3:Record monetary value USD of fiscal stimuli, including spending or tax cuts NOT included in H4, If none, enter 0; No data-blank
- H2: 0-No testing policy 1-Only those who both (a) have symptoms AND (b) meet specific criteria 2-testing of anyone showing COVID-19 symptoms 3-open public testing; No data
- H3:0-No contact tracing 1-Limited contact tracing-not done for all cases 2-Comprehensive contact tracing -done for all cases; No data
- H4:-Record monetary value in USD of new short-term spending on health -If none, enter 0; No data – blank
- H5: Record monetary value announced if additional to previously announced spending -If none, enter 0; No data-blank

Methodology

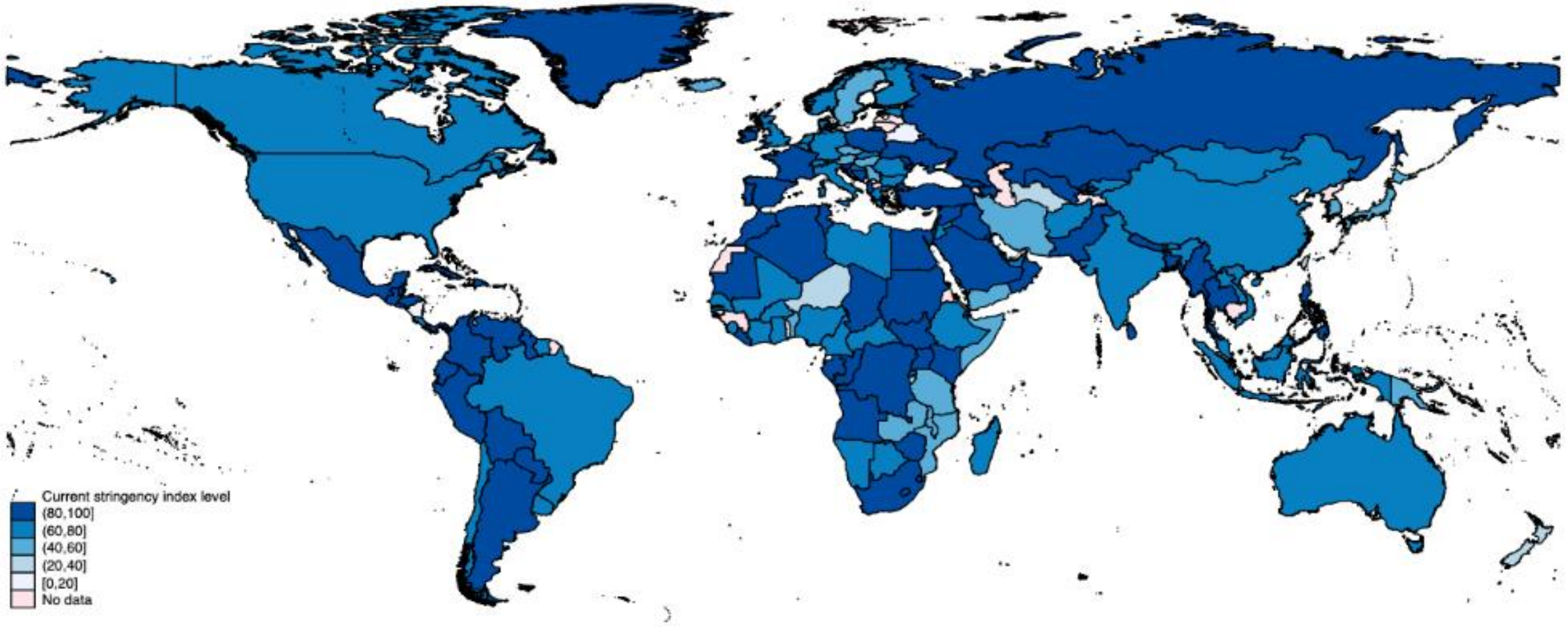
The stringency index is calculated using only the policy indicators C1-C8 and H1. The value of the index on any given day is the average of nine sub-indices, rescale each indicator between 0-100, and take mean.$I = \frac{1}{9}\sum_{j=1}^{9} Ij$

Indicator	Nj	Targeted/General?
C1	3 (0,1,2,3)	Yes
C2	3 (0,1,2,3)	Yes
C3	2 (0,1,2)	Yes
C4	4 (0,1,2,3,4)	Yes
C5	2 (0,1,2)	Yes
C6	3 (0,1,2,3)	Yes
C7	2 (0,1,2)	Yes
C8	4 (0,1,2,3,4)	No
H1	2 (0,1,2)	Yes

Results

Global comparisons

Map of government responses to COVID-19



Data from 19 May 2020. Individual countries may be several days older.

Source: Oxford COVID-19 Government Response Tracker. More at: bsg.ox.ac.uk/covidtracker or github.com/OxCGRT/covid-policy-tracker

Summary and Discussion

- The index allows to compare the polies across different countries.
- Whether the eleven indicators are proper to reflect the stringency of polies is still under discussing.
- Whether higher scores equal to better COVID-19 results still need to be discussed.

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