Discussant presentation for
# Roland-Holst et al., "ICT and Labor Mobility: Online Search and prediction of remittances in Kyrgyzstan"

Takahiro Yabe

MIT Institute for Data, Systems, and Society

ADBI workshop

Overall observations and highlights of the work

FIGURE 1.1a Remittance Flows to Low- and Middle-Income Countries Are Larger than Official Development Assistance and More Stable than Private Capital Flows, 1990–2019

($ billion)

(knomad.org)
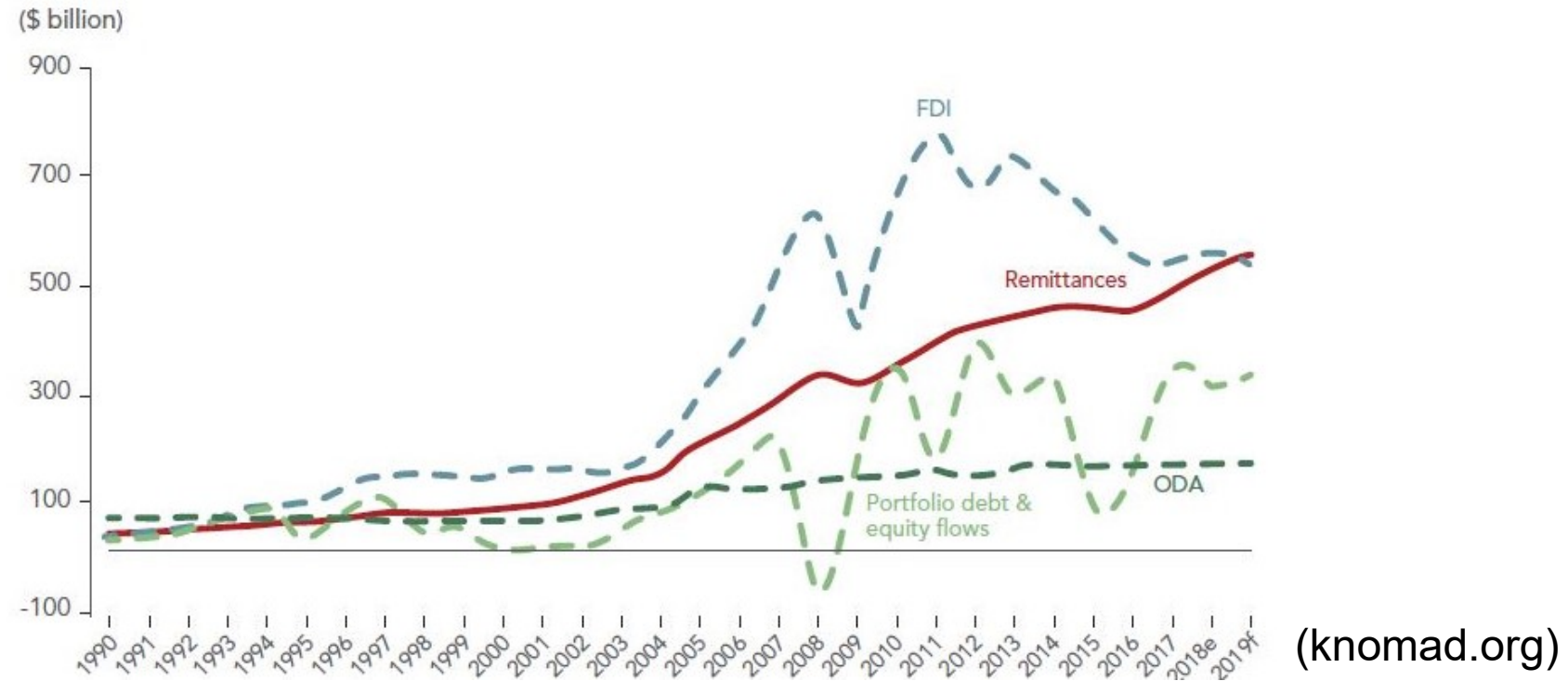
- Extremely important topic! (larger amount than FDI)
  - Importance of remittances on development should be stressed more in the paper

Review of the methodology & results

- May be used as proxy indexes for estimating the amount of remittances in absence of official statistics data
  - Great predictability (R^2 = 0.79) using just the Google Trends words, GDP, real exchange rates

Table 3. *Google trends words impact on remittance*

|	GT words in origin		GT words in destination		TOTAL	
GDP	0.0021***	-0.0007	-0.0015***	-0.0006	-0.0052***	-0.0015
REER	-0.0352***	-0.0089	-0.0809***	-0.0128	-0.1181***	-0.0406
GT origin words		0.0006				
Employment	0.0006	-0.0018				
Job Kg	-0.0087***	-0.0028			0.0535***	-0.0138
			⋮			
Kumis			-0.0491***		-0.0507***	
Issyk-Kul			0.0259**		0.0247**	
Constant	6.2762***	-1.2684	7.3250***		13.8313***	
ll	-34478.0198		-8667.6447		-8399.845	
r2	0.0236		0.7785		0.7909	
N	614		631		629	

Standard errors in parentheses
* *p* < 0.10, ** *p* < 0.05, *** *p* < 0.010

(from paper)

Follow up points on the analytics

- How consistent are the model results across different time periods?
  - Any seasonality? Effects of macroeconomic situations?

- Regional characteristics?
  - Google Trend Index data are available for Province levels in Kyrgyzstan, Russia, etc. → could we pin point important locations of searches for prediction?
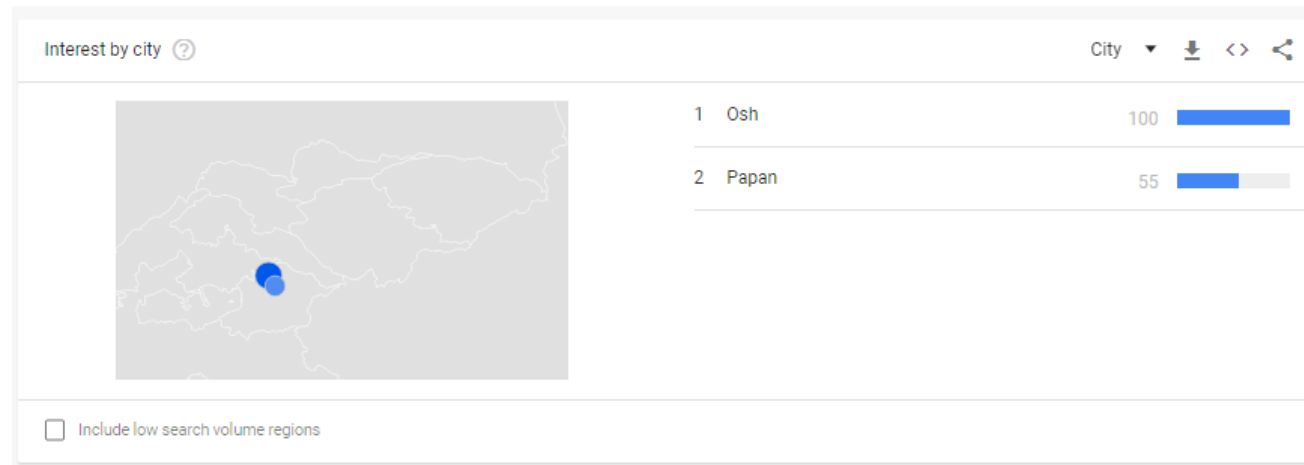
- How about remittances per capita? – when there is significant migration and relocation (e.g., during conflicts)

Suggestions for additional research questions

1. How do global shocks affect the amount of remittances, and how does the predictability change in different circumstances?
   - For example, during COVID-19, do the significant and important keywords in the model change?
   - Do international sanctions during the Ukraine – Russia conflict affect the remittance dynamics? (additional regulations, etc.?)
   - → [Policy Brief by KNOMAD](#)

2. If the model coefficients change during shocks and under different situations, how can we select keywords effectively?
   - A bag-of-words + machine learning approach could be effective
   - Natural language processing approaches to vectorize words
     - Bundle words that have similar semantics

On research direction 1: Impact of shocks on remittances

- Conflict has decreased the amount of remittance inflows to Kyrgyzstan by 33%

- How did the predictability of remittances using Google Trends Index change?

Table 1. Impact of Russia-Ukraine conflict on remittances—Flows to Ukraine are likely to increase while those to other countries in Central Asia are likely to decline

Country	Remittance inflows, 2020 ($ mn)	% of GDP, 2020	% of exports and services, 2020	Share of remittances from Russia, 2021 Q1-Q3	Originally projected growth rate, 2022	Revised projection of growth rate for 2022*
Armenia	1,327	10.5%	35.3%	59%	11%	-19%
Azerbaijan	1,403	3.3%	9.2%	62%	3%	-23%
Belarus	1,014	1.7%	2.7%	42%	15%	-8%
Georgia	2,110	13.3%	35.6%	18%**	2%	-5%
Kazakhstan	374	0.2%	0.7%	51%	7%	-17%
Kyrgyz Republic	2,423	31.3%	99.5%	83%	3%	-33%
Moldova	1,877	15.7%	58.2%	14%	6%	0%
Tajikistan	2,187	26.7%	155.2%	58%	2%	-22%
Ukraine	15,213	9.8%	25.1%	5%	2%	8%
Uzbekistan	6,980	11.6%	48.0%	55%	3%	-21%

Sources: Bank of Russia, National Bank of Ukraine, National Bank of Georgia, and KNOMAD-World Bank

Notes: * Assuming decline of 40% in remittances from Russia. Projected growth rates for other source countries are assumed to remain unchanged from those reported in the Migration and Development Brief 35 (KNOMAD–World Bank, November 2021)

**Data for Georgia are taken from the National Bank of Georgia. Remittance inflows from Russia to Georgia are available for all 4 quarters of 2021 (annex table 3).

Policy Brief by KNOMAD

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On research direction 2: A more data-driven approach

- Machine learning (deep learning) approaches can <u>automatically</u> select important search words that contribute to predictability

- E.g., our previous work on predicting COVID-19 cases using web search data
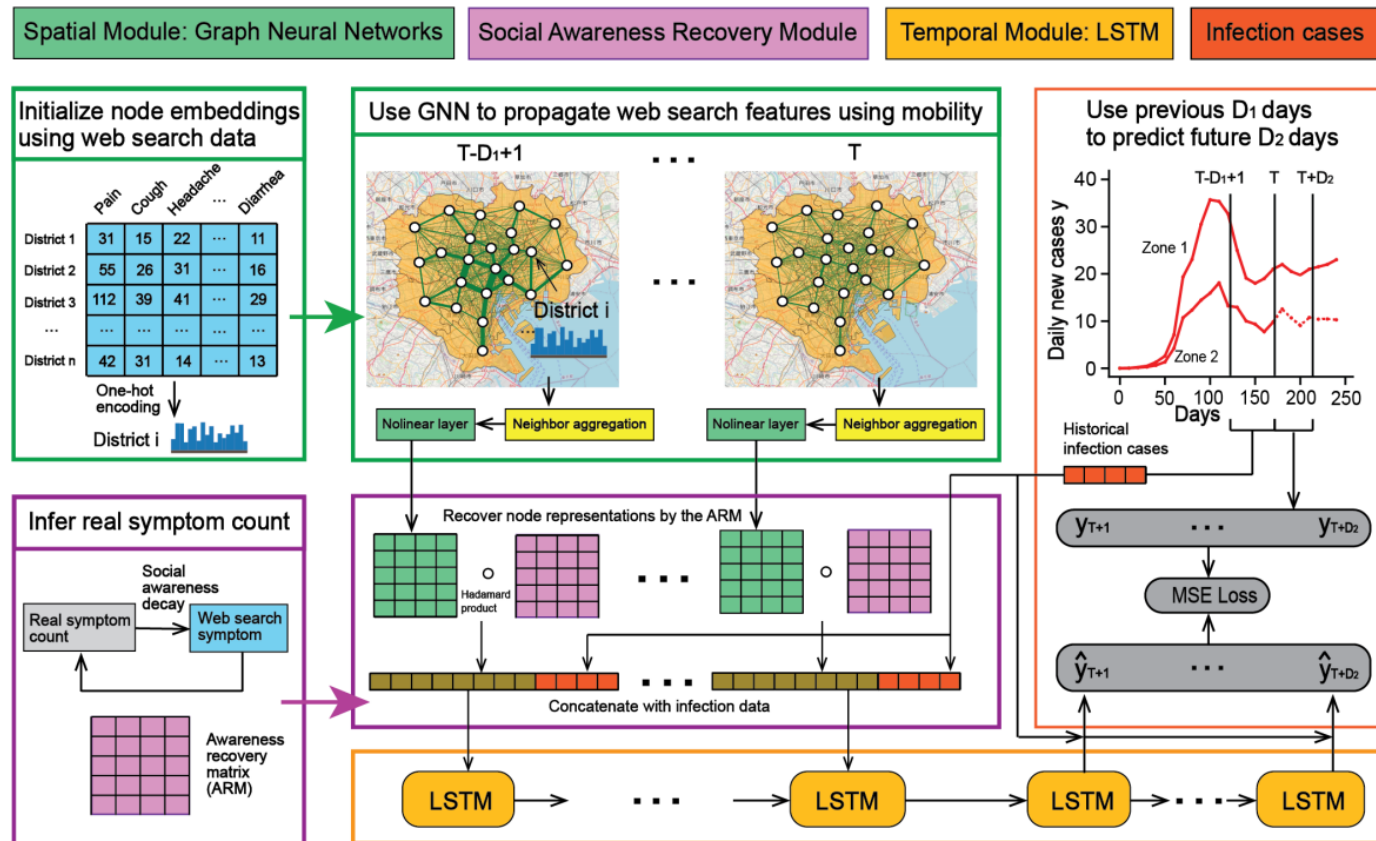
Xue, Yabe, ..., Ukkusuri (2021)

Summary of discussion

- Very important topic, and innovative approach using GTI data (open data)
- Follow up on the analytics
  - Regional analytics?
  - Temporal consistency of results?
- Research directions
  - Impact of shocks (and conflicts) on remittances and its predictability
  - A more data-driven approach for better predictability?

More general policy questions

- This study is an important methodological component – but how can it improve the overall dynamics of remittance flows?
  - How can these methods contribute to improving resilience of the flow of remittances to developing countries?
  - Applications = Real time monitoring + short term prediction → create a more enabling environment

- Policy measures that governments can implement:
  - Reducing transfer costs dynamically when a drop in remittances is anticipated?
  - Creating incentives to attract diaspora investments (e.g., saving accounts in foreign currency?)
  - Private sector applications? (e.g., Recommendation services for remittance senders?)

- More generally, are remittances leading to more human capital investment back in Kyrgyzstan? Economic development?

Thank you!

Takahiro (Taka) Yabe
tyabe@mit.edu