Does One Size Fit All? Comparing the Determinants of the FinTech Market Segments Expansion

Mikhail Stolbov
Moscow State Institute of International Relations (MGIMO–University)

Maria Shchepeleva
National Research University Higher School of Economics

37th Symposium on Money, Banking, and Finance
17 June 2021

Electronic copy available at: https://ssrn.com/abstract=3868820

Outline

- Motivation
- Data
- Empirical Strategy
- Results & Discussion
- Takeaways

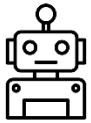
Electronic copy available at: https://ssrn.com/abstract=3868820

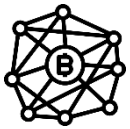
Motivation (1)

- There is no conventional definition of Fintech
- According to the recent authoritative studies, e.g. Goldstein et al. (2019), Thakor (2020), **Fintech includes:**


innovations in payments (cryptocurrencies)


capital-raising activities (peer-to-peer lending)


investment management services (robo-investing)


insurance services associated with Blockchain-assisted smart contracts

- FinTech-related research appears one of the fastest emerging research programs in finance.

Electronic copy available at: https://ssrn.com/abstract=3868820

Motivation (2)

- There are relatively few studies seeking to identify the driving forces of FinTech development in a cross-country framework

- FinTech determinants
  - Haddad and Hornuf (2019)
  - Kowalewski and Pisany (2020)
  - Laidroo and Avarmaa (2020)
  - Sahay et al. (2020)

- Cryptocurrency adoption
  - Saedi et al. (2020)

- Peer-to-peer lending expansion
  - Claessens et al. (2018)
  - Bazarbash and Beaton (2020)
  - Oh and Rosenkranz (2020)

The paper aims to identify what the driving forces of the overall FinTech market are and compare them to the determinants of the two major Fintech segments – cryptocurrency and peer-to-peer lending markets

Electronic copy available at: https://ssrn.com/abstract=3868820

Data (1)

- We consider a sample of 64 countries
- *Dependent variables*
  - **FINDEX** - a country score in **the Global FinTech Index** released by Findexable (2019)
  - **COIN_RANK** - a country score in the ranking provided by **Cointobuy.io** (2019)
  - **P2P** - the volume of peer-to-peer lending, borrowed from the **Cambridge Centre for Alternative Finance** (2018)

- *Categories of potential determinants* (51 variables, based on previous literature and heuristic considerations)
  - Institutional
  - Social
  - Structural
  - Macroeconomic
  - Financial variables

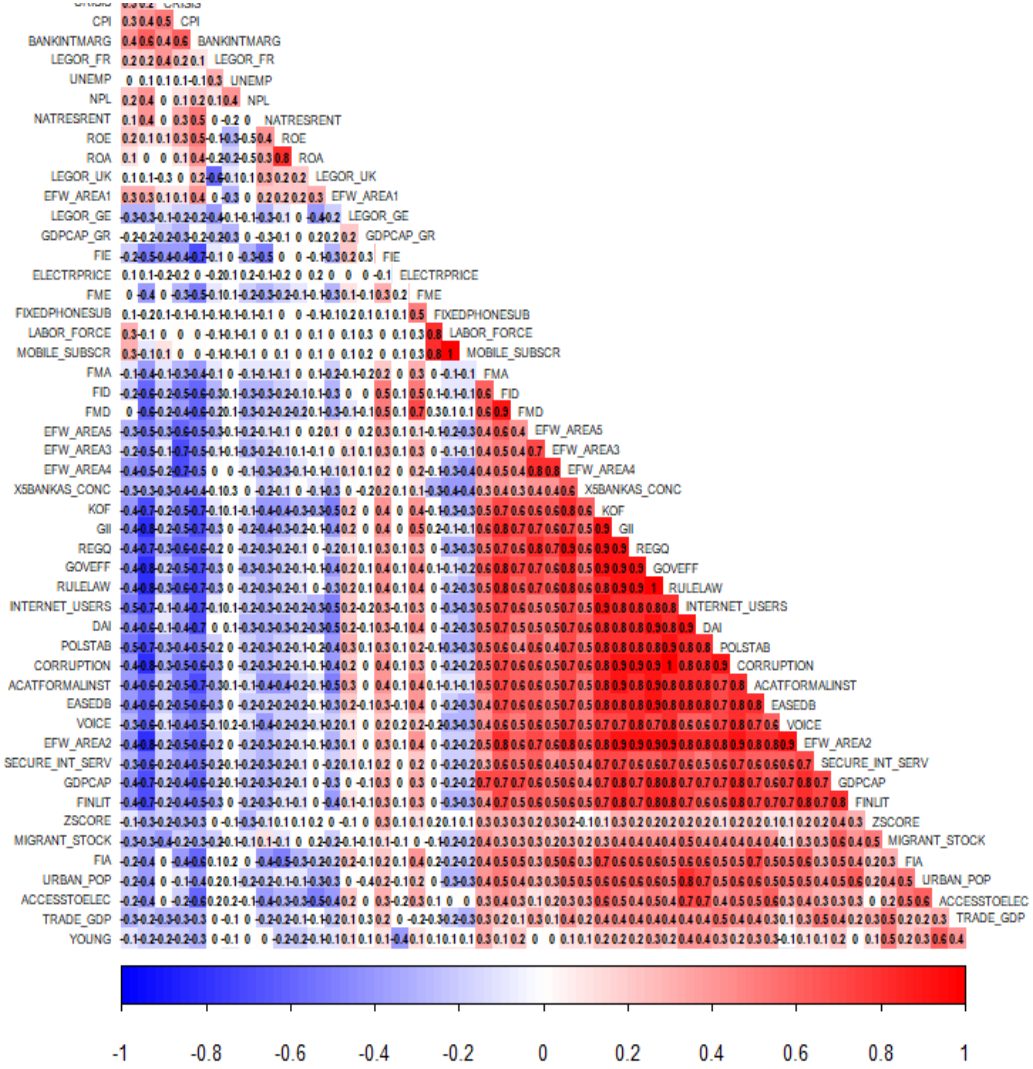
Electronic copy available at: https://ssrn.com/abstract=3868820

Data (2)

	FINDEX	COIN_RANK	P2P
FINDEX	1.00		
COIN_RANK	0.47	1.00	
P2P	0.21	0.06	1.00

Electronic copy available at: https://ssrn.com/abstract=3868820

Data (3)



Electronic copy available at: https://ssrn.com/abstract=3868820

Methodology (1)

Bayesian model averaging (BMA)

The BMA seeks to resolve the model uncertainty by averaging over the best models in the model class based on approximate posterior model probability. The general set-up of the BMA is

$$\Pr(Y|S) = \sum_{k \in B} \Pr(Y = 1|S,\ M_k) * \Pr(\ M_k|S)$$

where $\Pr(Y|S)$ is a posterior probability of the response variable Y given the training data set S, $\Pr(Y|S,\ M_k)$ is a posterior probability of Y given the training data set S and model M_k, $\Pr(\ M_k|S)$ is a posterior probability of model M_k given the training data set S.

Least absolute shrinkage and selection operator (LASSO)

Let us consider a multivariate regression model predicting y_t as a linear function of a constant, b_0, and N regressors. The coefficients for these regressors $(b_1, \ldots, b_N)$ can be chosen by minimizing the sum of squared residuals plus a penalty term in the following form

Electronic copy available at: https://ssrn.com/abstract=3868820

Methodology (2)

- **Variable selection using random forests (VSURF)**

VSURF is a three-step variable selection procedure based on random forests. At the first step, it removes irrelevant independent variables. The second step aims to select significant variables for interpretation purposes, while the third one ultimately refines the search for prediction purposes by eliminating redundancy from the set of variables chosen at the previous step

- **Spike-and-slab regression**

This is a Bayesian variable selection technique, involving Markov chain Monte Carlo (MCMC) algorithm for regression models with a specific prior which places some amount of posterior probability at zero for a subset of the regression coefficients.

Electronic copy available at: https://ssrn.com/abstract=3868820

Results (1)

	BMA	LASSO	RANDOM FOREST (VSURF)	SPIKE-AND-SLAB
FINDEX	FIXEDPHONESUB	FIXEDPHONESUB	GII	FIXEDPHONESUB
	LABOR_FORCE	SECURE_INT_SERV	FMD	LABOR_FORCE
	MOBILE_SUBSCR	CRISIS	BANKINTMARG	MOBILE_SUBSCR
	GII	LEGOR_UK	EFW_AREA2	GII
	LEGOR_UK	FMD	EFW_AREA3	
		EASEDB		
		EFW_AREA1		
		GII		
COIN_RANK	KOF	ACATFORMALINST	ACATFORMALINST	ACATFORMALINST
	FINLIT	ACCESSTOELEC	SECURE_INT_SERV	KOF
	ACATFORMALINST	FIA	FIA	
		KOF	GDPCAP	
P2P	FIXEDPHONESUB	FIXEDPHONESUB	FIXEDPHONESUB	FIXEDPHONESUB
	LABOR_FORCE	LABOR_FORCE		
	MOBILE_SUBSCR			

Electronic copy available at: https://ssrn.com/abstract=3868820

Results: fintech determinants

- Our findings are partly consistent with the literature (Haddad and Hornuf, 2019; Laidroo and Avarmaa, 2020; Sahay et al., 2020) emphasizing the relevance of labor force, the number of mobile phone subscriptions as the determinants of the overall FinTech market development

- We also show that the FinTech market as a whole has more odds to prosper in the jurisdictions with a higher general proness to innovations, well-developed communication infrastructure, deeper financial markets and British law

- Although the total number of significant determinants of the overall FinTech development is limited, they represent almost the entire spectrum of factor groups

Electronic copy available at: https://ssrn.com/abstract=3868820

Results: cryptocurrency determinants

- In case of the cryptocurrency segment of the FinTech market, the number of relevant determinants tends to be smaller

- The first-tier determinant of the cryptocurrency segment expansion is the level of financial inclusion, i.e. the share of adults (15+) with an account at a formal financial institution. Thus, our results indicate that cryptocurrency adoption is likely to follow financial inclusion, rather than the opposite

- Financial openness is the second-tier determinant of the cryptocurrency segment. Thus, only financial and macroeconomic factors drive the expansion of the cryptocurrency segment in the FinTech market

Electronic copy available at: https://ssrn.com/abstract=3868820

Results: peer-to-peer lending determinants

- The number of significant determinants of the peer-to-peer lending segment is also rather limited

- The number of fixed phone subscriptions is the most salient variable determining the expansion of peer-to-peer lending segment

- Labor force appears the second-tier determinant detected by two out of the four techniques. Similar to the cryptocurrency segment, the determinants belonging in just two factor groups influence the peer-to-peer lending segment expansion, i.e. structural and macroeconomic ones

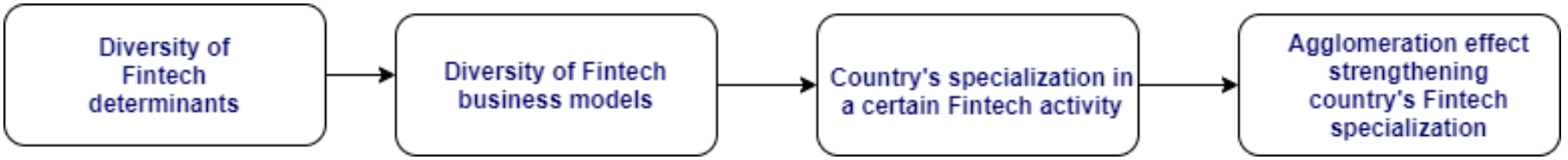
Electronic copy available at: https://ssrn.com/abstract=3868820

Results: comparison

- There is little commonality between statistically significant determinants of the three FinTech development proxies

- All in all, our findings call for specific policy measures to support (or to deter) the FinTech market segment expansion rather than to elaborate uniform ones for all of them

- The diversity of determinants implies that countries had better engage in specific FinTech activities rather than seek to build a universal specialization



Electronic copy available at: https://ssrn.com/abstract=3868820

Limitations

- Our study has a natural limitation, as due to the data availability we managed to cover only two key segments of the FinTech market

- Once the cross-country sources on the development of FinTech investment management and insurance are available, it will lay foundations to conduct a more comprehensive comparative research on the determinants of FinTech market segments expansion

Electronic copy available at: https://ssrn.com/abstract=3868820

Takeaways

- The number of statistically significant determinants is larger for the overall index of FinTech market development compared to the segments
- We find limited commonality between statistically significant determinants of the three FinTech development proxies
- A wide range of factors (institutional, structural, macroeconomic and financial) determines the FinTech market development as a whole
- Macroeconomic and financial factors drive the expansion of its cryptocurrency segment, while peer-to-peer lending is mainly boosted by macroeconomic and structural variables
- This result calls for targeted rather than uniform policy measures to support (or to deter) the FinTech market development. The diversity of determinants which we document also means that it can be problematic for most countries to excel in all FinTech activities

Electronic copy available at: https://ssrn.com/abstract=3868820