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PROJECTING HOUSEHOLD DEMAND FOR CBDC IN RUSSIA

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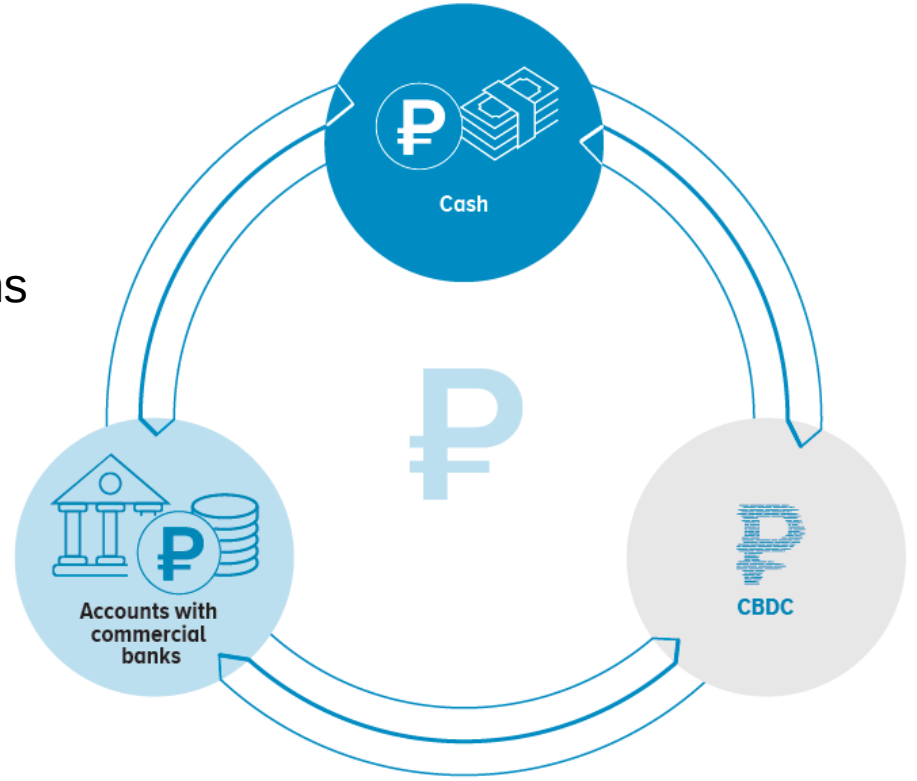
A DIGITAL RUBLE PROJECT

Digital Ruble: definition and features

Digital Ruble is the 3rd form of money

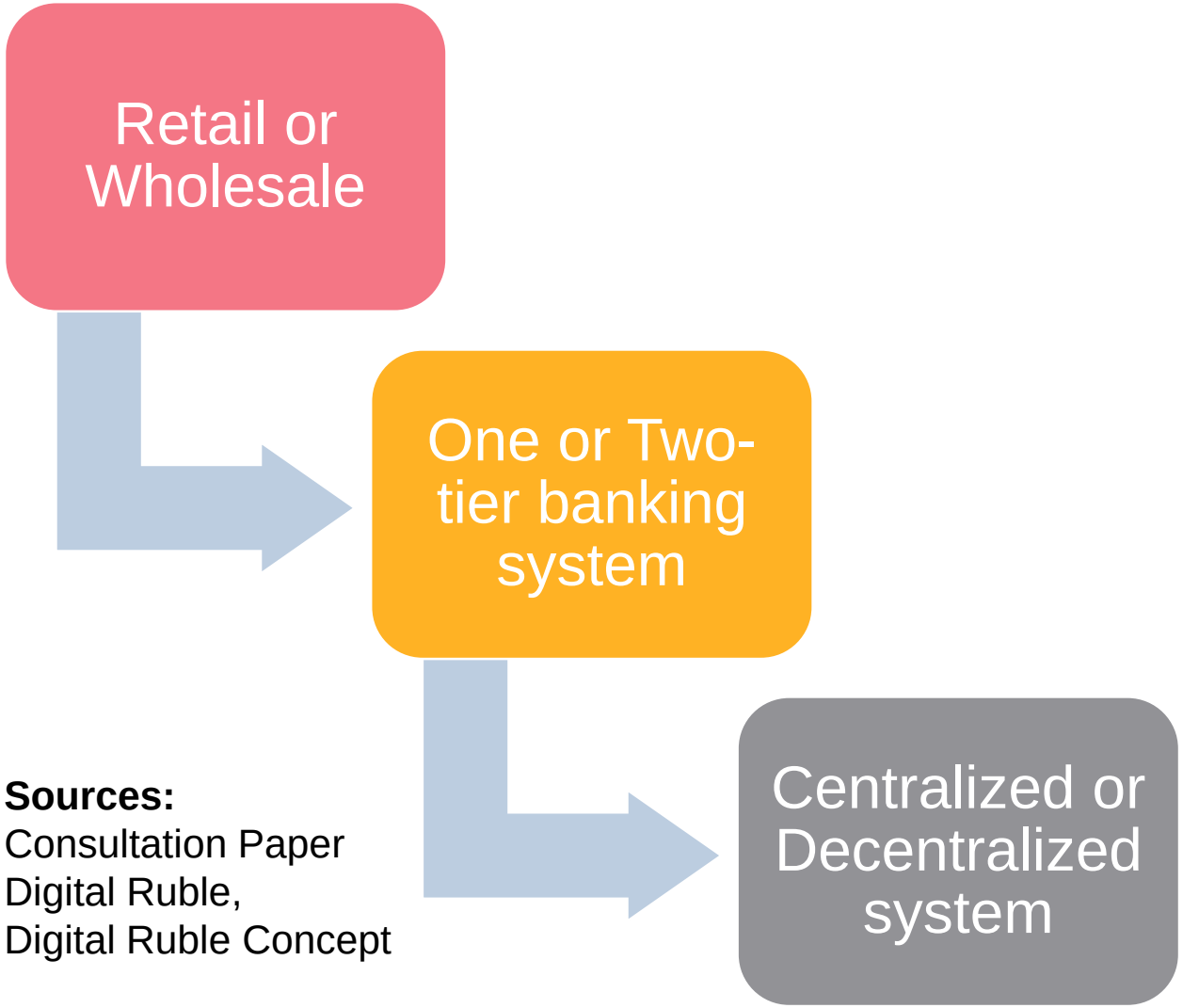
Bank of Russia is the sole issuer
Digital Ruble is Bank of Russia's obligation

- Access to the digital wallet using apps of financial organizations
- High speed of payments
- Offline regime available
- Innovation services
- Transactional cost reduction



Sources: Consultation Paper Digital Ruble,
Digital Ruble Concept

CBDC: design options and the choice of the Bank of Russia



Sources:
Consultation Paper
Digital Ruble,
Digital Ruble Concept

- **Retail**
  - Consumers, businesses, banks and the Federal Treasury to participate
- **Two-tier**
  - Banks are only intermediaries which provide payment services
- **Hybrid**
  - A combination of distributed ledgers and centralized components
- **Not remunerated**
  - Digital Ruble is a payment medium rather than a store of value

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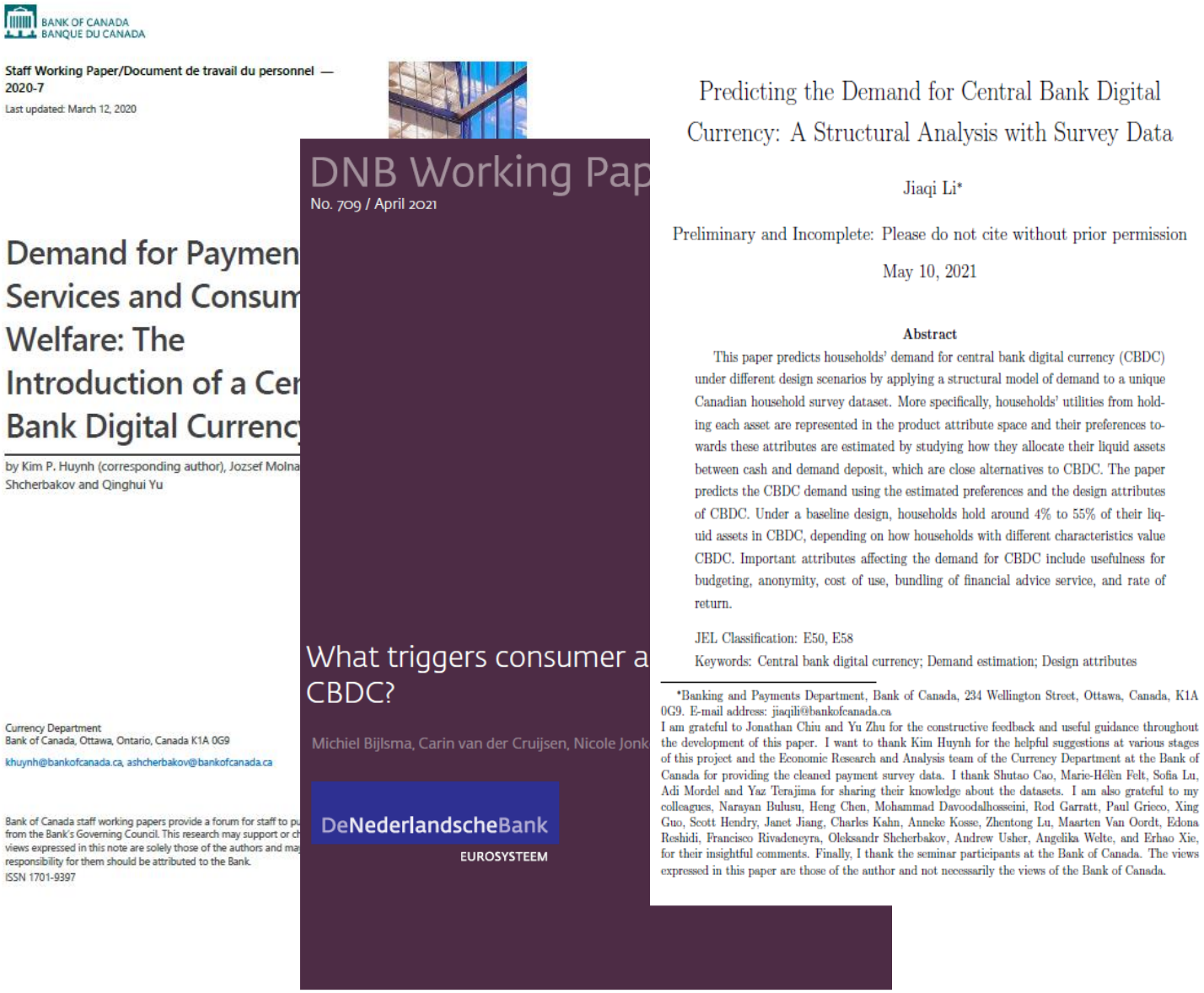
METHODOLOGY

The idea

- ‘Attributes approach’: Huyn et al (2020), Li (2021), Bank of England (2021), Bijlsma et al. (2021)
  - Demand for payment instruments is a function of instrument’s characteristics (**attributes**): cost, availability, safety, etc.
  - Evaluate perception to attributes based on survey data on the participants’ use of existing payment instruments – cash and deposits
  - Stemming from these estimates and features of Digital Ruble we determine the desired amount of that in circulation



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Staff Working Paper/Document de travail du personnel — 2020-7

Last updated: March 12, 2020

Demand for Payment Services and Consum Welfare: The Introduction of a Cer Bank Digital Currenc

by Kim P. Huynh (corresponding author), Jozsef Molna Shcherbakov and Qinghui Yu

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DNB Working Pap

No. 709 / April 2021

What triggers consumer a CBDC?

Michiel Bijlsma, Carin van der Cruijsen, Nicole Jonk

DeNederlandscheBank

EUROSYSTEEM

Predicting the Demand for Central Bank Digital Currency: A Structural Analysis with Survey Data

Jiaqi Li*

Preliminary and Incomplete: Please do not cite without prior permission

May 10, 2021

Abstract

This paper predicts households’ demand for central bank digital currency (CBDC) under different design scenarios by applying a structural model of demand to a unique Canadian household survey dataset. More specifically, households’ utilities from holding each asset are represented in the product attribute space and their preferences towards these attributes are estimated by studying how they allocate their liquid assets between cash and demand deposit, which are close alternatives to CBDC. The paper predicts the CBDC demand using the estimated preferences and the design attributes of CBDC. Under a baseline design, households hold around 4% to 55% of their liquid assets in CBDC, depending on how households with different characteristics value CBDC. Important attributes affecting the demand for CBDC include usefulness for budgeting, anonymity, cost of use, bundling of financial advice service, and rate of return.

JEL Classification: E50, E58

Keywords: Central bank digital currency; Demand estimation; Design attributes

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Methodology

Step I – estimate perception of attributes

- Make a list of characteristics based on international experience (**‘attributes’, indirect method**) or factors mentioned by respondents (**‘quasi-attributes’, direct method**)
- Add questions about attributes to the new survey conducted by the Currency Circulation Department of the Bank of Russia (2021)
- Get frequencies of use of payment instruments from the same survey
- Regress payment frequencies on attributes and control variables

Methodology

Step II – develop scenarios based on assumptions regarding CBDC features

- Vary the values of attributes to get scenarios:
  - pessimistic (people are unlikely to use CBDC),
  - optimistic (people will prefer CBDC to other means of payment),
  - realistic (CBDC features will be comparable to those of cards and cash)

Methodology

Step III – estimate demand for CBDC in each scenario

- Use exponential weighting of shares of each instrument in transactions to get estimates of demand which conform to intuition and economic theory

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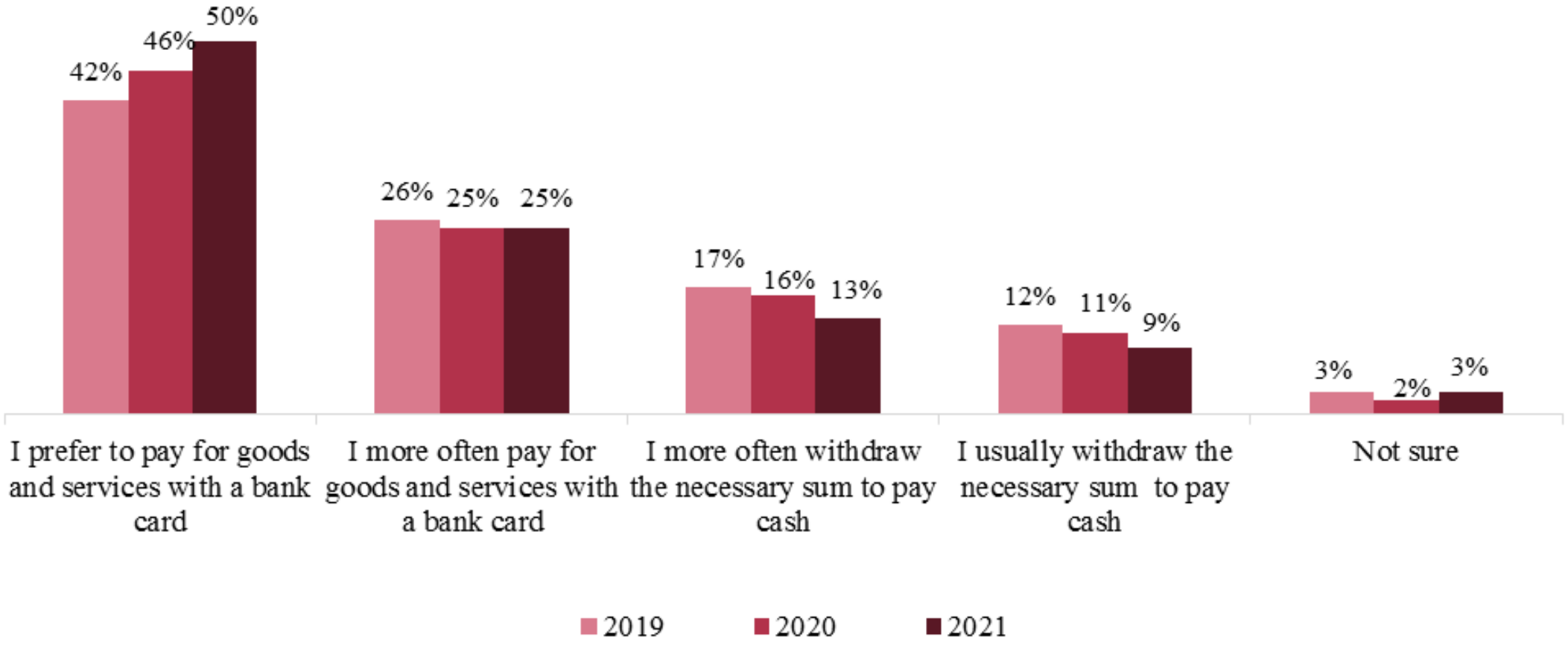
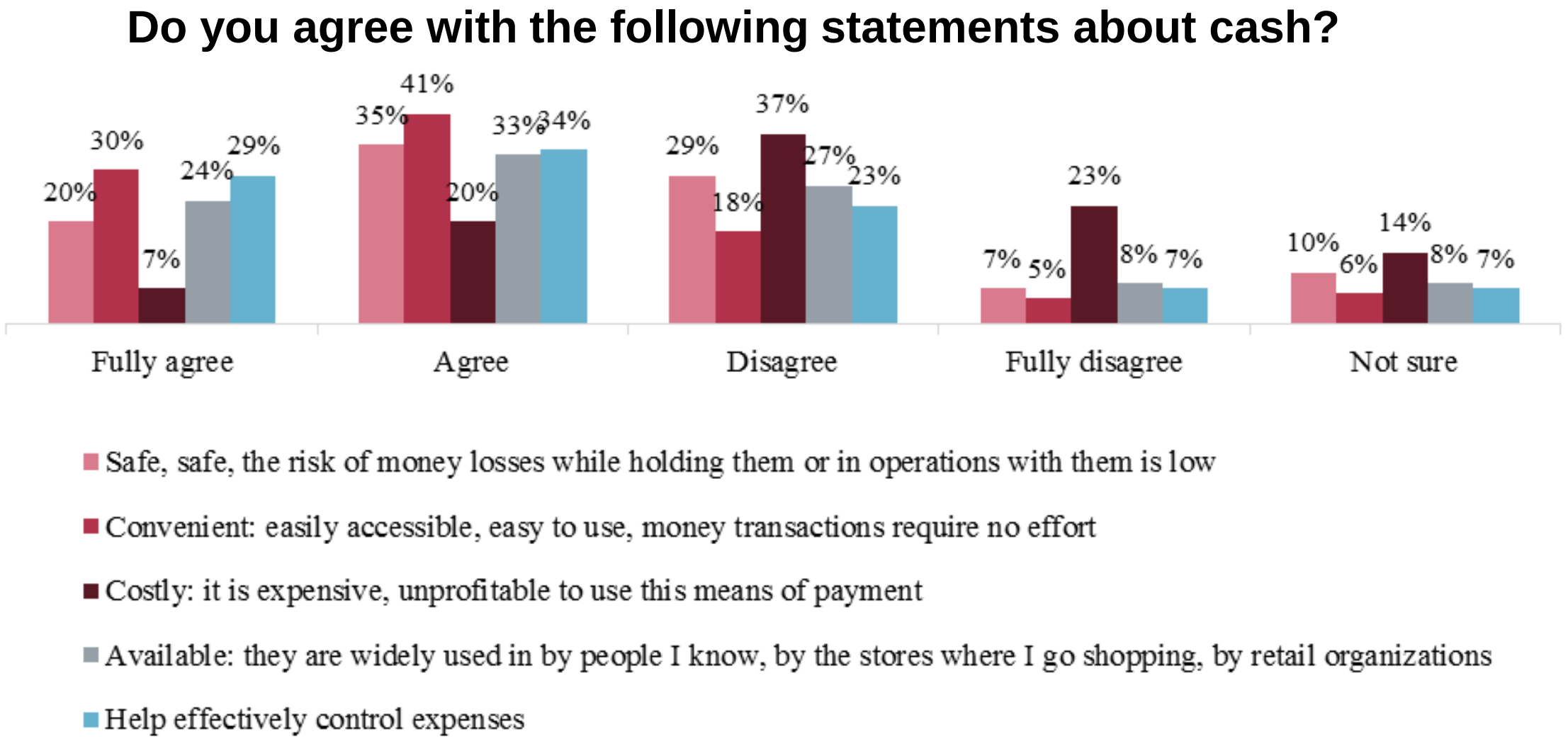
DATA

The use of instruments

Do you prefer to use bank cards to pay for goods and services or to withdraw the necessary sums of cash to make payments?



Indirect method: attributes

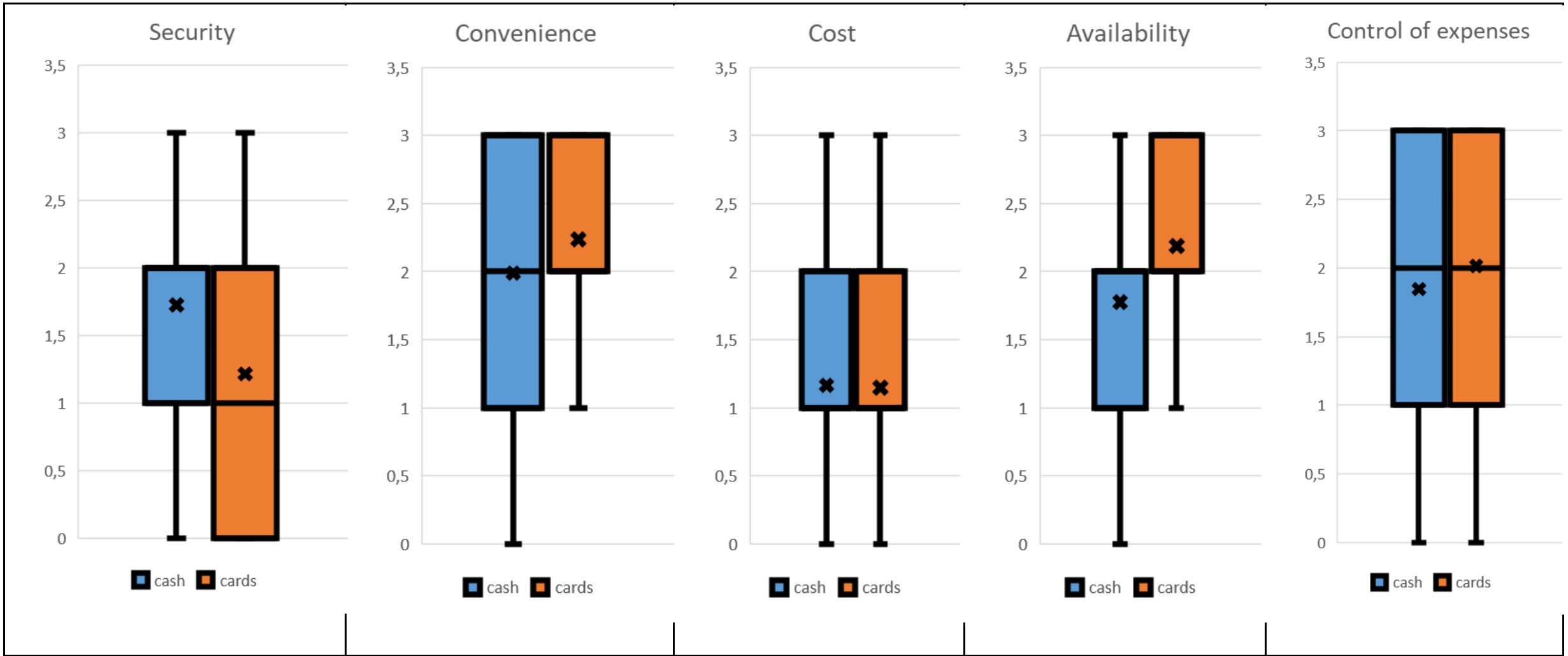


Indirect method: attributes

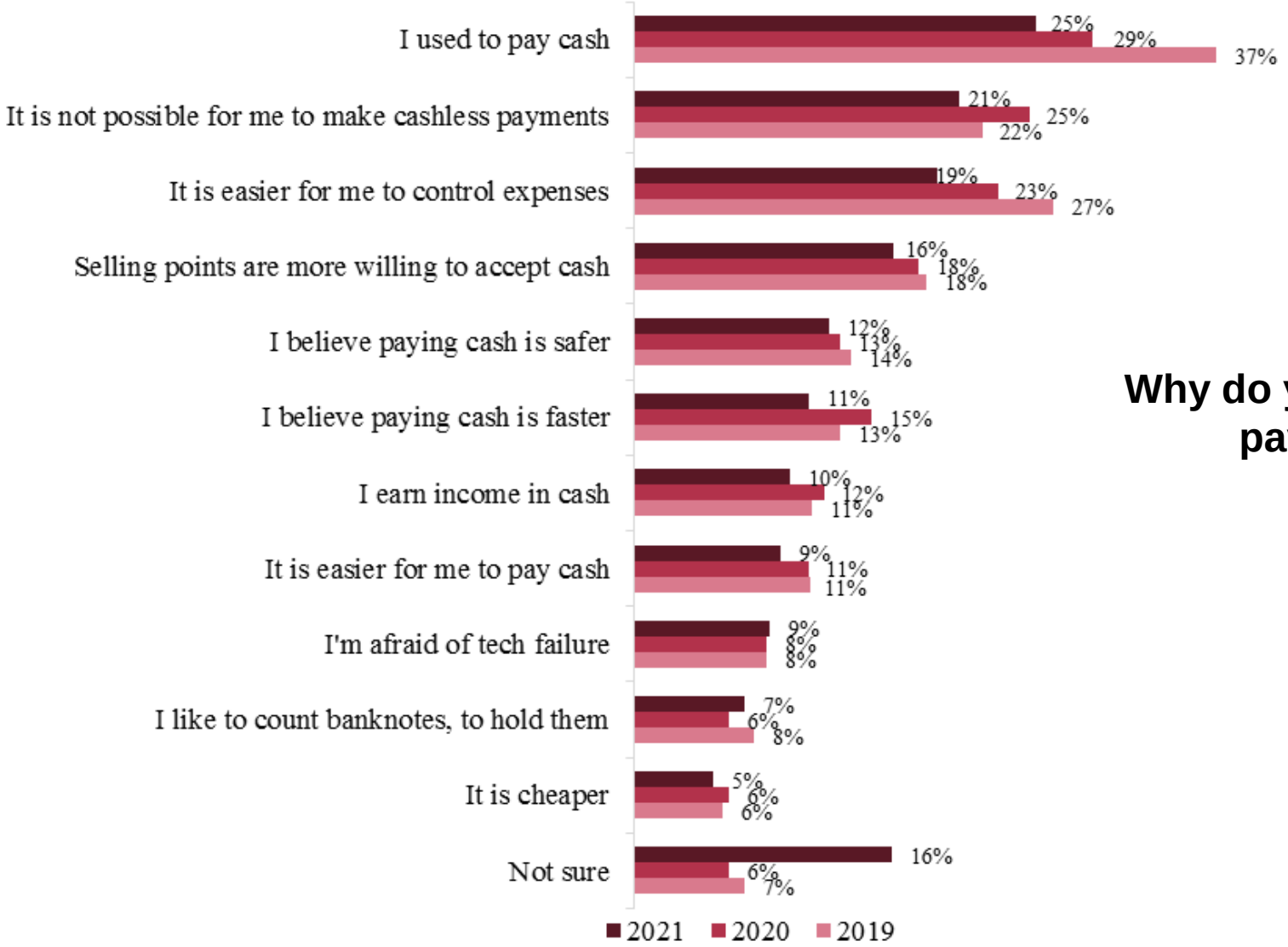
Do you agree with the following statements about cashless instruments?

Perception of attributes

Distribution of the responses to the questions about attributes of means of payment

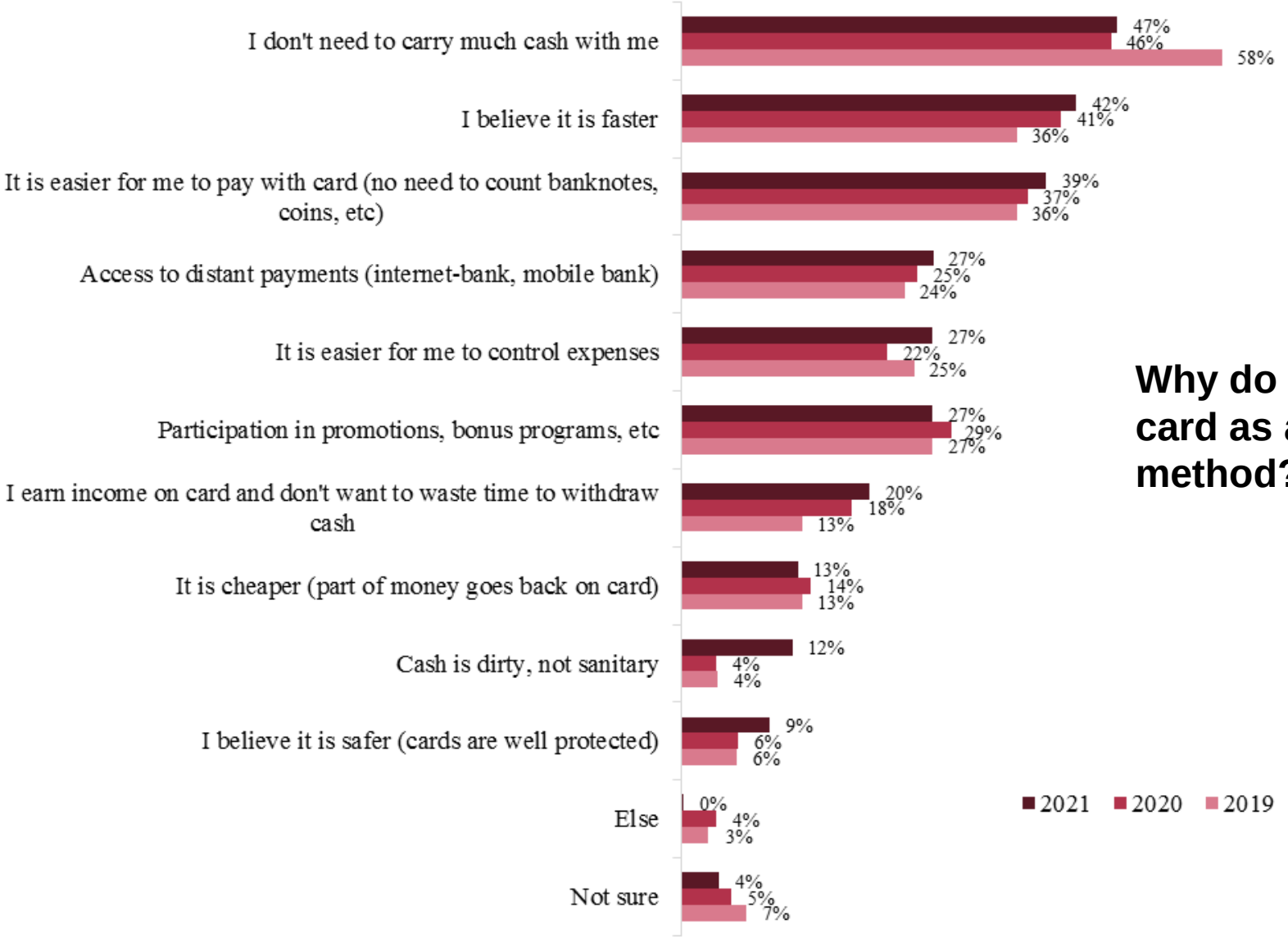


Direct questions regarding the choice of the instrument – q-attributes



Why do you choose cash as a payment method?

Direct questions regarding the choice of the instrument – q-attributes



Why do you use bank card as a payment method?

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MODEL

The model

$$s_n^i = \beta_0^i + \beta_a a_n^i + \beta_X^i X_n + \varepsilon_n^i$$

$$sh_n^i = \frac{e^{s_n^i}}{\sum_{j=1}^{N_I} e^{s_n^j}}$$

The model: how do we ask respondents

Dual questioning

$$s_n^i = \beta_0^i + \beta_a a_n^i + \beta_X^i X_n + \varepsilon_n^i$$

Questions regarding attributes

$$s_n^i = \beta_0^i + \beta_a a_n^i + \beta_X^i X_n + \varepsilon_n^i$$

Direct questions regarding instrument's choice

$$s_n^i = \beta_0^i + \beta_a a_n^i + \beta_X^i X_n + \varepsilon_n^i$$

Results: unobservable scores' elasticities

	Attributes	q-Attributes
Constant (β_0^{card}-β_0^{cash})	**0.65** [0.53;0.77]	**0.22** [0.09;0.34]
Security	**0.19** [0.07;0.31]	**0.19** [0.11;0.27]
Convenience	**0.45** [0.31;0.6]	**1.5** [1.33;1.67]
Cost	**-0.08** [-0.2;0.03]	**-0.33** [-0.42;-0.23]
Availability	**0.39** [0.27;0.51]	**0.31** [0.24;0.38]
Control of expenses	**0.28** [0.17;0.39]	**0.22** [0.16;0.28]

Scenarios

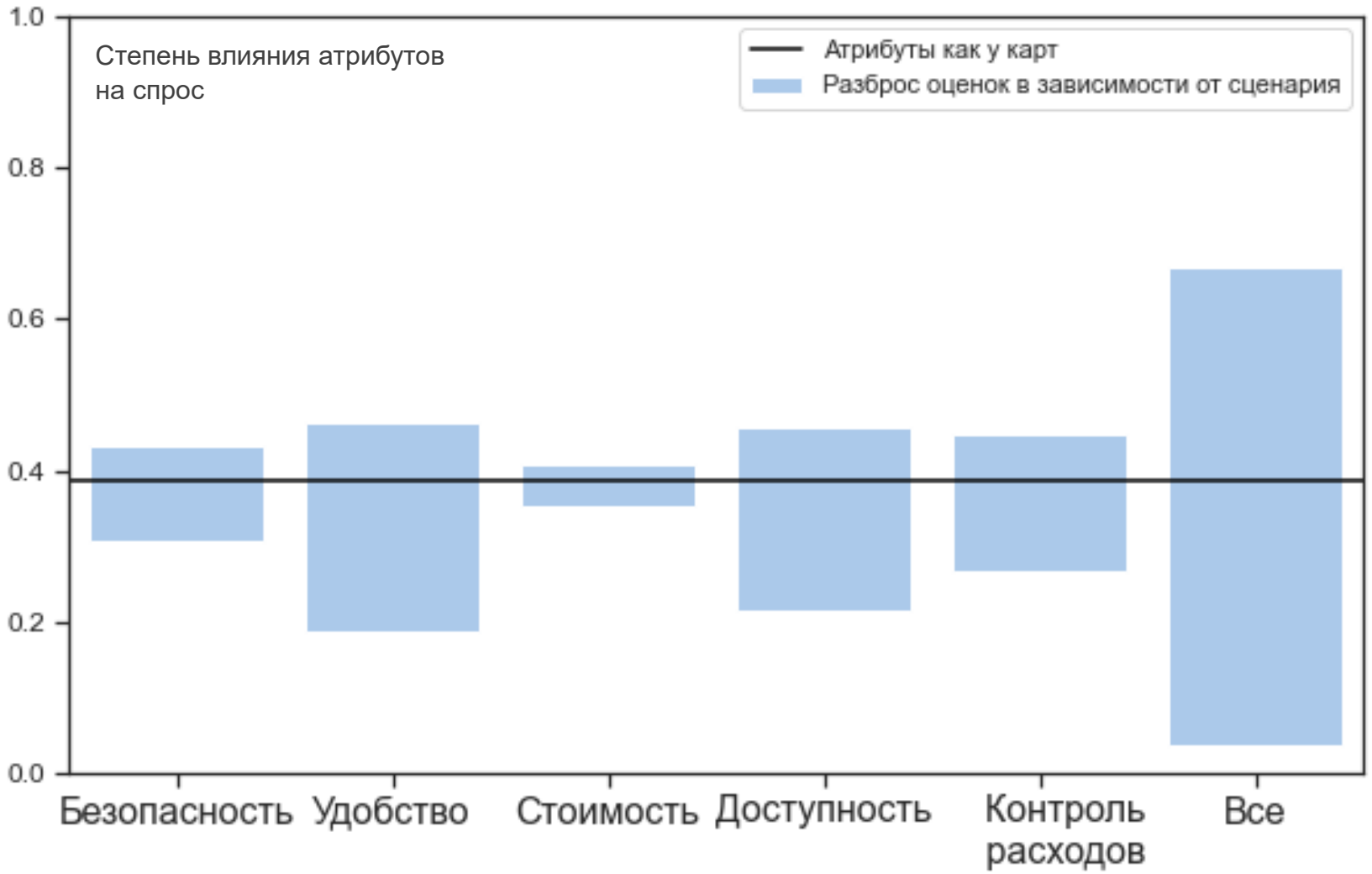
Optimistic: CBDC has highest possible attributes

Pessimistic: CBDC has lowest possible attributes

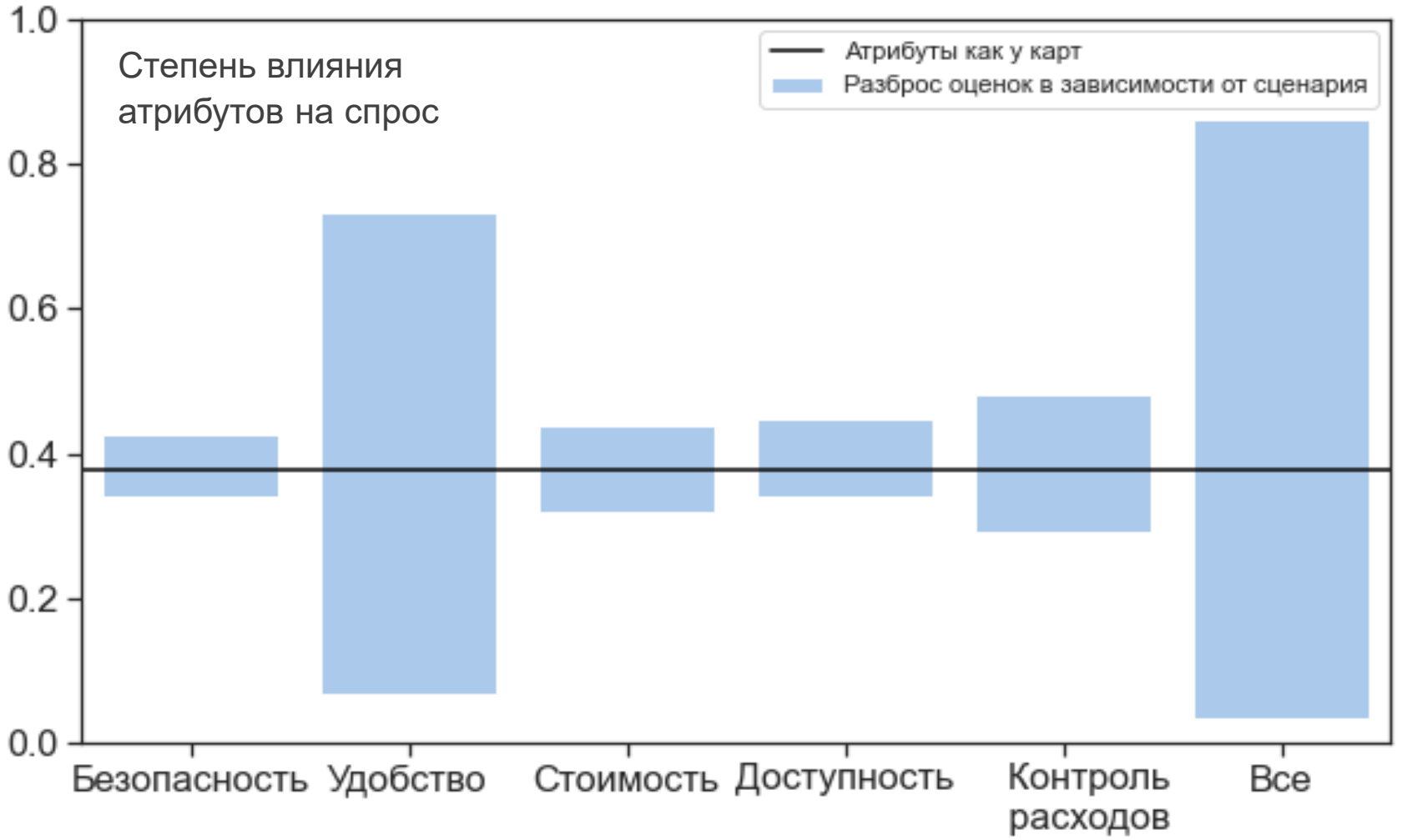
Card-like: CBDC’s attributes are identical to bank cards

Realistic: CBDC is slightly inferior compared to bank cards in aspects except safety

Scenarios


Степень влияния атрибутов на спрос
Атрибуты как у карт
Разброс оценок в зависимости от сценария
1.0
0.8
0.6
0.4
0.2
0.0
Безопасность
Удобство
Стоимость
Доступность
Контроль расходов
Все

Scenarios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0.2
0.0
Безопасность
Удобство
Стоимость
Доступность
Контроль расходов
Все

Robustness checks

- Demographic and geographic controls are included
- Only card users are included in the sample
- Alternative aggregation scheme for q-attributes is employed
- Data of 2020 survey is used to estimate the model

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CONCLUSIONS

The model

- The proposed model may be used to predict the demand for CBDC conditionally on its expected design and consumers' perception.

- Depending on the scenario, the predicted utilization of CBDC varies considerably. Although under the realistic assumptions the demand for CBDC is likely to be moderate.

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