

Visa Inc

Cashless Cities

Realizing the Benefits of Digital Payments

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Everywhere You Want to Be

VISA

Cashless Cities

Contents

- 1 Study & Methodology Overview
- 2 Impact Data
- 3 Appendix:
Action Roadmap
Key Findings by Level of Payments Maturity

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Cashless Cities

Research Overview



Objectives

Establish value of digital payments for various stakeholders

Recommend policies that encourage adoption of digital payments

Provide an evidence-based case for governments to incorporate digital payment solutions



Why Cities?

Urbanization More than 80% of global GDP is generated in cities

Concentration of transactions

A vast majority of payment transactions takes place in cities

Influential stakeholders *"In this century, it will be the city—not the state—that becomes the nexus of economic and political power."*

- McKinsey & Company



Research Question

How much does a city (and its constituents) stand to benefit from increasing digital payments usage?



Research Approach

Segment 100 cities from 80 countries into five categories based on digital payment usage and readiness

Survey 3,000 consumers and 900 businesses across 6 representative cities

Model net benefits for 100 cities

<https://usa.visa.com/dam/VCOM/global/visa-everywhere/documents/visa-cashless-cities-technical-appendix.pdf>



Tecnología no disponible para todas las ciudades del país ni todos los medios de transporte de la ciudad.



VISA

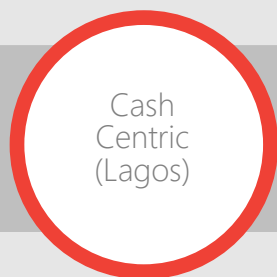


Cashless Cities: Realizing the benefits of



Digital Payment Maturity Spectrum

100 Cities Classified Into One of Five Categories. 6 Representative Cities



Cash
Centric
(Lagos)

- Low digital payments usage; low adoption readiness
- High unbanked population



Digitally
Transitioning
(Bangkok)

- Low digital payments usage; moderate adoption readiness
- High unbanked population



Digitally
Maturing
(Tokyo &
Sao Paulo)

- High readiness, low usage - Cultural inclination toward cash (Tokyo)
- OR
- Low readiness, high usage - High unbanked population (Sao Paulo)



Digitally
Advanced
(Chicago)

- Developed digital infrastructure, but maintains considerable cash usage
- Low levels of unbanked population



Digital
Leader
(Stockholm)

- High usage, high readiness
- Developed banking and digital payment system
- Population nearly fully banked

LAC

Cities Included in the Study

Cash Centric

- Buenos Aires, Argentina
- Bogota, Colombia
- Santo Domingo, Dominican Republic
- Kingston, Jamaica
- Mexico City, Mexico
- Monterrey, Mexico
- Panama City, Panama
- Lima, Peru

Digitally Transitioning

- Santiago, Chile
- San Jose, Costa Rica
- San Juan, Puerto Rico
- Montevideo, Uruguay
- Caracas, Venezuela

Digitally Maturing

- Brasilia, Brazil
- **Sao Paulo, Brazil***

Digitally Advanced

- N/A

Digital Leader

- N/A



Impact Data

Net Benefits for Various Stakeholders

Both Benefits, and Costs Considered

Benefits

Consumers

- Time savings in banking, transit and retail transactions
- Float savings
- Savings from avoidance of late payment fees
- Savings from reduced crime
- Increased convenience
- More personalized customer service

Businesses

- Reduced theft and pilferage
- Labor time savings
- Potential for sales through digital channels
- Better data to improve customer service
- Convenient inventory tracking
- Utilize data to improve loyalty schemes

Governments

- Reduction in the size of informal economies
- Savings from more efficient government processes
- Toll-road and transit agency cost savings
- Better data on citizen needs
- Smart cities to enhance quality of life for citizens

Costs

Consumers

- Costs of getting access to bank/digital payment accounts
- Digital payment fraud-related costs

Businesses

- Investment in digital payment infrastructure
- Digital payment fraud-related costs

Governments

- Capital investment in transitioning to digital payment systems
- Training costs



Potential Direct Net Benefits and Economic Impacts

Total spread across all 100 cities

Potential direct net benefits across 100 cities per year for payments industry stakeholders
(Achievable Cashless Scenario)

Total net
benefits*
\$470
billion



Total consumer
net benefits
\$28
billion



Total business
net benefits
\$312
billion



Total
government net
benefits
\$130
billion

**This translates to an
average of 3.08% of GDP
per city*

Potential Economic impacts for 100 cities over 15 years (2017-2032)
(Achievable Cashless Scenario)

Total
additional
economic
activity#
\$12
trillion



GDP
19
Average annual
basis point
increase



Employment
5
Million jobs
supported over 15
years



Productivity
0.14%
Increase in
baseline CAGR



Wages
0.16%
Increase in
baseline CAGR

#Between 2017 and 2032

Data Points for 100 cities available

Average net benefits for 100 cities

Direct Net Benefits: US\$ Value of Annual Net Benefits if Cities Increased their Use of Digital Payments



Consumers

- Average transit time savings: 4m hours
- Average banking time savings: 14m hours
- Average transaction time savings: 21m hours

Average time savings: 39 million hours*

Average savings from reduced late payment fees: \$13 million

Average float benefits: \$16 million

Average savings from reduced cash-related crime: \$134 million

Average increased banking costs: \$11 million

Average net consumer benefits:
\$278 million



Businesses

- Average net labor time savings: 20 million hours
- Average net time savings at the point-of-sale: 10 million hours

Average time savings: 30 million hours*

Average net savings from transitioning to digital payments infrastructure: \$2 million

Average increased business sales: \$2 billion

Average float costs: \$0.8 million

Average business net benefits:
\$3 billion



Governments

- Average increased taxes from reduced informal economy: \$339 million
- Average increased taxes from increased business sales: \$131 million
- Average increased taxes from increased economic growth: \$64 million

Average increased taxes: \$534 million

Average cost savings from increased efficiencies: \$710 million

Average cost savings from reduced cash-related crime: \$53 million

Average government net benefits:
\$1.3 billion

Catalytic Impacts: Additional Benefits from 2017-2032 if Cities Increased their Use of Digital Payments



Average GDP growth of 19.4 basis points



45,000 new jobs added on average, by 2032



Average increase in wage growth of 0.16%



Average increase in productivity growth of 0.14%

*Note: Time savings can be converted to a \$ impact figure

Bogotá

Beneficios Netos Directos estimados por año

Bogotá podría obtener US\$4.300 millones en beneficios netos directos estimados



Consumidores

US\$ 300 millones



Negocios

US\$ 2.800 millones



Gobiernos

US\$1.200 millones

Impactos catalíticos estimados durante los siguientes 15 años



Crecimiento del PIB*

8,7 puntos básicos

Derivado del ahorro de tiempo generado entre los consumidores, los negocios y los gobiernos debido a mayores eficiencias asociadas con pagos digitales



Nuevos empleos respaldados[#]

2.9% incremento en el empleo como porcentaje del empleo actual

Derivados de ahorros en tiempo generados entre los negocios y los consumidores, resultando en un aumento

*These are estimated increases in average annual growth rates for each year from 2017-2032

[#] The employment data represents the total number of new jobs supported between 2017 and 2032.

Achievable Cashless Scenario: Benefits Overview

Impact by Level of Digital Payments Maturity

Direct Annual Net Benefits for an Average City*

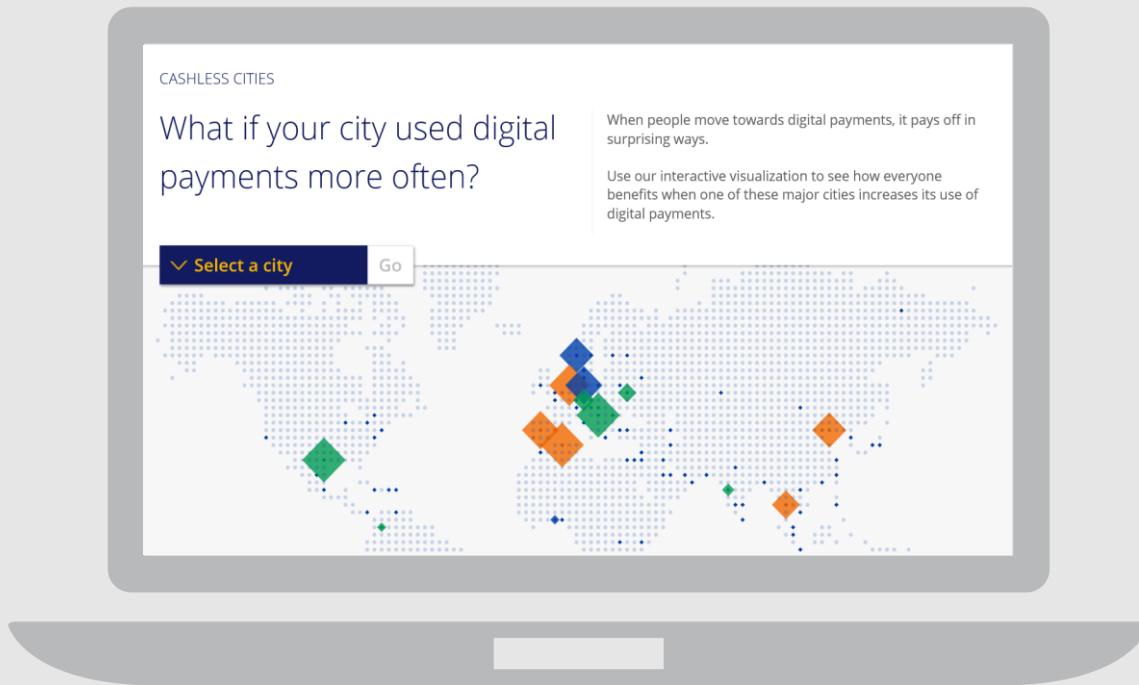
Catalytic Impacts over the next 15 years (2017-2032)*
for an Average City

	 Consumers	 Business	 Government	 GDP Growth (basis points)#	 New jobs supported#	 Bump up in baseline productivity growth#	 Bump up in baseline wage growth#
Cash Centric	\$130m	\$1.8b	\$743m	20	91,500	0.1%	0.1%
Digitally Transitioning	\$180m	\$1.6b	\$996m	14	26,000	0.1%	0.1%
Digitally Maturing	\$307m	\$5.2b	\$1.6b	19	41,700	0.2%	0.2%
Digitally Advanced	\$493m	\$3.3b	\$2.1b	21	29,000	0.2%	0.2%
Digital Leader	\$407m	\$4.8b	\$1.1b	27	13,600	0.3%	0.3%

*These are impacts for an average cash-centric, digitally transitioning, digitally maturing, digitally advanced and digital leader cities #GDP, productivity and wage growth impacts depict the bump up in annual baseline growth rates. These impacts are projected to carry over annually for the next 15 years. The employment data however, represents the total number of new jobs supported between 2017 and 2032.

Explore City-Level Data

Net Benefits and Catalytic Impacts for 100 Cities



Barriers to Adopting Electronic Payments



Limited Access to
Digital Payment
Products



Inadequate Digital
Infrastructure



Cultural and
Habitual
Attachment to Cash



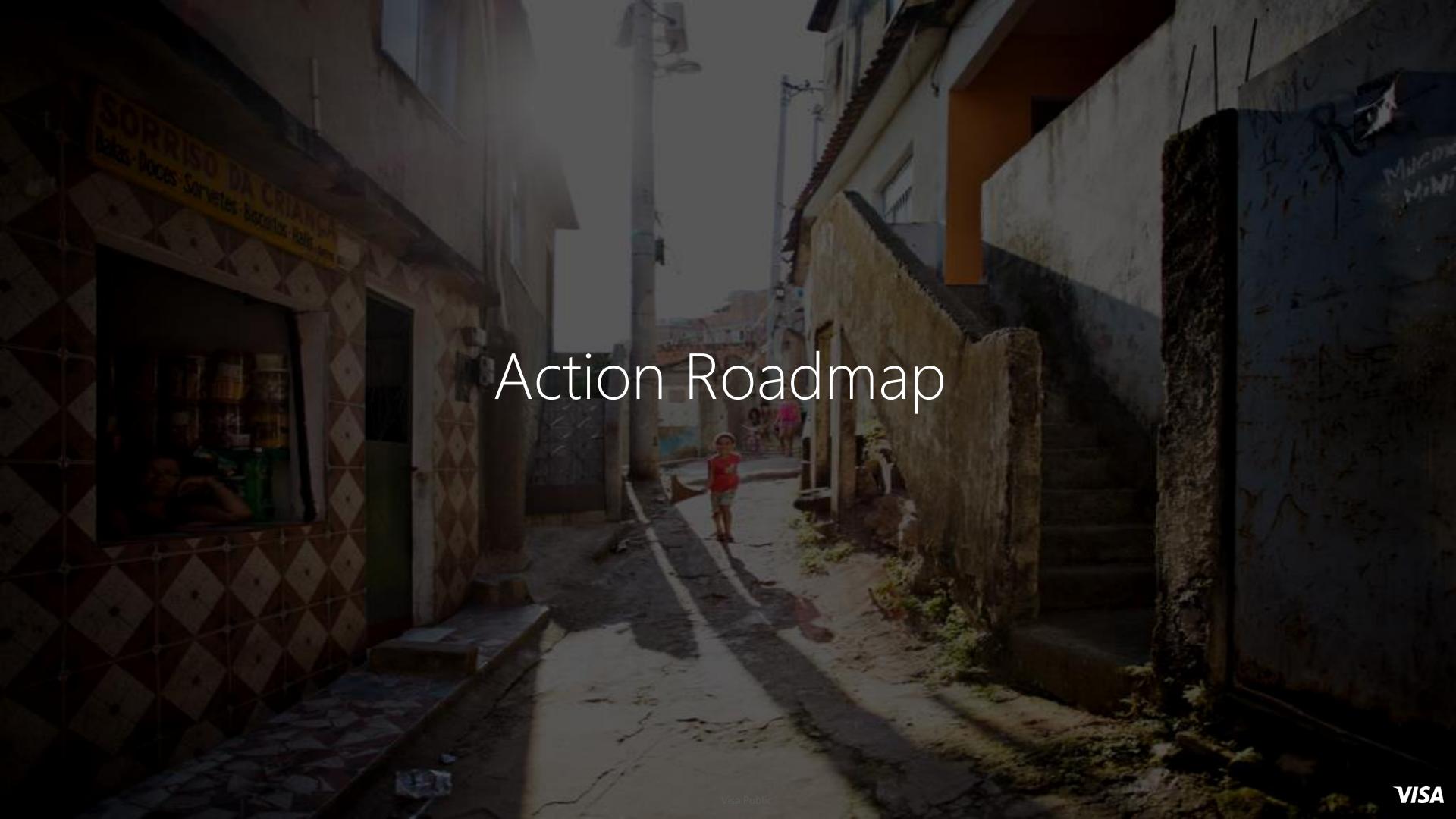
Security and Privacy
Concerns



Misperception that Costs of
Accepting Digital Payments
are Higher than Cash

Appendix



A photograph of a narrow, unpaved street in a favela. On the left, there is a shop with a diamond-patterned facade and a sign that reads "SORRISO DA CRIANÇA" and "Bolos - Doces - Sorvetes - Biscoitos - Leite". A person is visible inside the shop. On the right, there is a concrete staircase leading up a hill. In the background, a child in a red shirt is walking down the street. The scene is dimly lit, suggesting dusk or dawn.

Action Roadmap

Action Roadmap

61 call to action identified

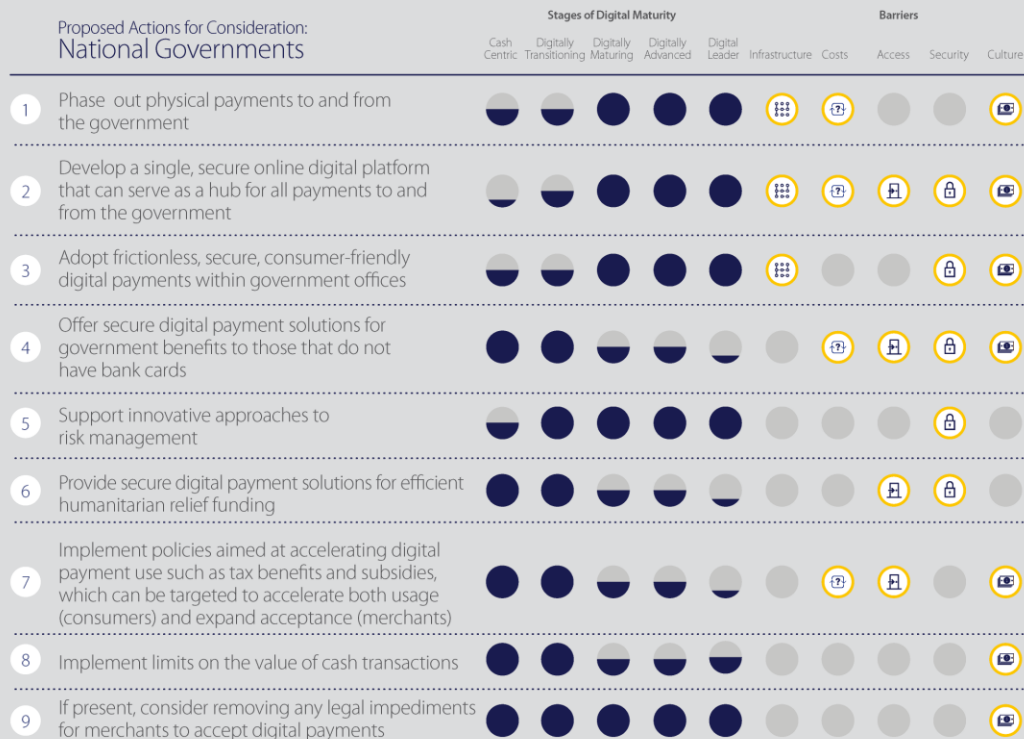
- 26 calls to action identified for national governments
- 13 calls to action identified for Sub-national governments, including City-level governments
- 7 calls to action identified for merchants, 5 for consumers and 10 for digital payments service providers
- Actions mapped to level of digital payment maturity and addressable barriers

A Selection of Actions

Proposed Actions for Consideration: National Governments		Stages of Digital Maturity					Barriers				
		Cash Centric	Digitally Transitioning	Digitally Maturing	Digitally Advanced	Digital Leader	Infrastructure	Costs	Access	Security	Culture
1	Phase out physical payments to and from the government	●	●	●	●	●	●	●			●
2	Develop a single, secure online digital platform that can serve as a hub for all payments to and from the government	●	●	●	●	●	●	●	●	●	●
3	Adopt frictionless, secure, consumer-friendly digital payments within government offices	●	●	●	●	●	●			●	●
4	Offer secure digital payment solutions for government benefits to those that do not have bank cards	●	●	●	●	●		●	●	●	●
5	Support innovative approaches to risk management	●	●	●	●	●				●	
6	Provide secure digital payment solutions for efficient humanitarian relief funding	●	●	●	●	●			●	●	
7	Implement policies aimed at accelerating digital payment use such as tax benefits and subsidies, which can be targeted to accelerate both usage (consumers) and expand acceptance (merchants)	●	●	●	●	●		●	●		●
8	Implement limits on the value of cash transactions	●	●	●	●	●					●
9	If present, consider removing any legal impediments for merchants to accept digital payments	●	●	●	●	●					●

Action Roadmap

Calls to Action: National Governments



References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



Limited **access** to digital payment products



Security, risk and privacy concerns



Cultural and habitual attachment to cash



High impact: Can be implemented without delay and/or expected to significantly increase digital payments usage



Moderate impact: Can be implemented with some potential delays and/or expected to moderately increase digital payments usage

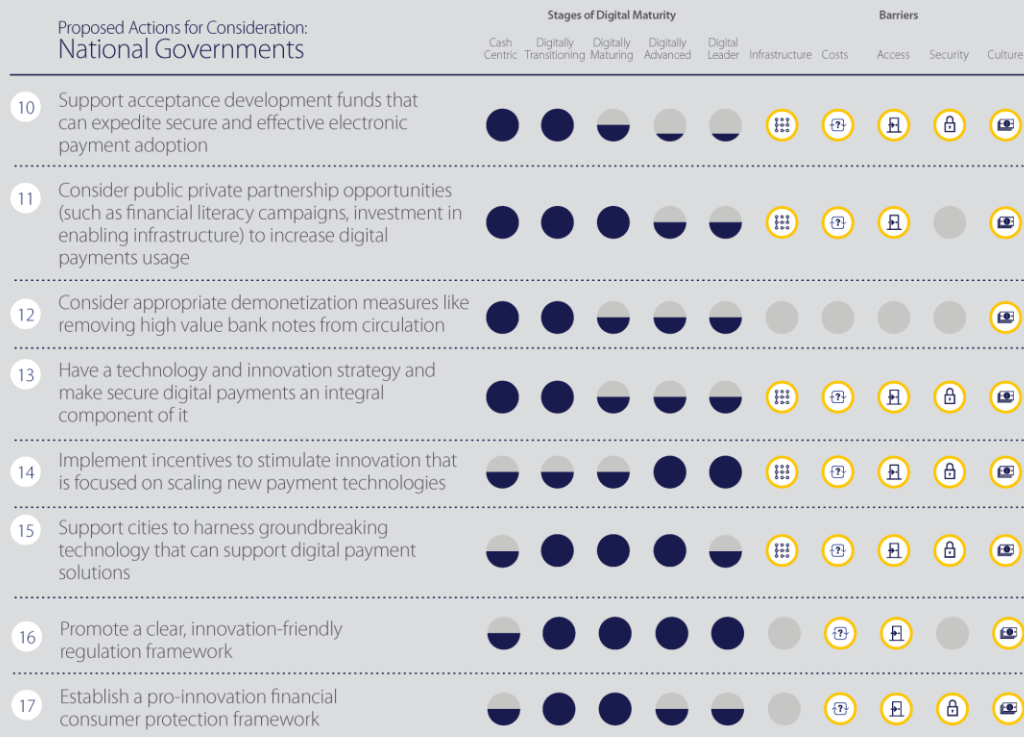


Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: National Governments

Proposed Actions for Consideration: National Governments



References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



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Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: National Governments

Proposed Actions for Consideration: National Governments

Proposed Actions for Consideration:		Stages of Digital Maturity						Barriers				
National Governments		Cash Centric	Digitally Transitioning	Digitally Maturing	Digitally Advanced	Digital Leader	Infrastructure	Costs	Access	Security	Culture	
17	Establish a pro-innovation financial consumer protection framework											
18	Support access to secure digital payments for micro and small enterprises											
19	Ensure new market players meet established industry standards											
20	Promote a fair, competitive marketplace for all financial institutions											
21	Share best practices for transitioning to secure digital payments that create value for all stakeholders											
22	Support best-in-class privacy standards											
23	Create reliable, secure connectivity to facilitate digital transactions											
24	Collaborate with industry to develop a national strategy to increase financial inclusion											
25	Undertake targeted financial literacy campaigns											
26	Reasonably remove regulatory barriers to cross-border commerce											

References:



Inadequate digital infrastructure



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Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: Sub-national Governments

Proposed Calls to Action for Consideration:
Sub-national Governments Including Cities

	Stages of Digital Maturity					Barriers				
	Cash Centric	Digitally Transitioning	Digitally Maturing	Digitally Advanced	Digital Leader	Infrastructure	Costs	Access	Security	Culture
27	Partner with innovative companies, other cities/ regions, and research institutions to bring groundbreaking technology that can support digital payments to the city	●	●	●	●	●	●	●	●	●
28	Develop and implement a "smart city" or similar strategy that includes digital payments as a key component	●	●	●	●	●	●	●	●	●
29	Implement secure open-loop payment systems across all transportation networks	●	●	●	●	●	●	●	●	●
30	Offer incentives for frequent ridership on an open-loop transit payment account	●	●	●	●	●	●	●	●	●
31	Provide a convenient, secure online portal where commuters can track amount spent and usage	●	●	●	●	●	●	●	●	●
32	Implement secure digital-only toll collection	●	●	●	●	●	●	●	●	●
33	Promote and allow for usage of small transaction digital payments in public places, like parking meters and cafes	●	●	●	●	●	●	●	●	●
34	Implement policies aimed at accelerating digital payment use such as tax benefits and subsidies, which can be targeted to accelerate both usage (consumers) and expand acceptance (merchants)	●	●	●	●	●	●	●	●	●

References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



Limited **access** to digital payment products



Security, risk and privacy concerns



Cultural and habitual attachment to cash



High impact: Can be implemented without delay and/or expected to significantly increase digital payments usage



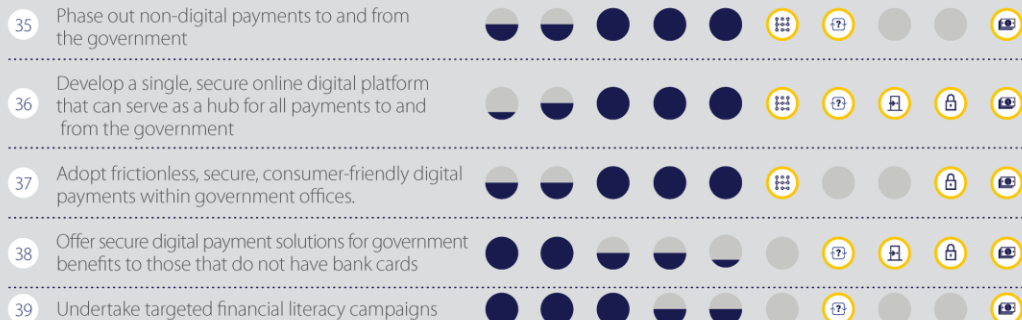
Moderate impact: Can be implemented with some potential delays and/or expected to moderately increase digital payments usage



Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: Sub-national Governments & Merchants



Proposed Calls to Action for Consideration: Merchants



References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



Limited **access** to digital payment products



Security, risk and privacy concerns



Cultural and habitual attachment to cash



High impact: Can be implemented without delay and/or expected to significantly increase digital payments usage



Moderate impact: Can be implemented with some potential delays and/or expected to moderately increase digital payments usage



Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: Consumers

44	Charge customers the same price regardless of type of payment used									
45	Train customer-facing staff on digital payment technology and security best practice									
46	Pay employees and suppliers electronically									

Proposed Calls to Action for Consideration:		Stages of Digital Maturity							Barriers			
Consumers		Cash Centric	Digitally Transitioning	Digitally Maturing	Digitally Advanced	Digital Leader	Infrastructure	Costs	Access	Security	Cultural	
47	Establish a formal relationship with a financial institution and open a secure digital payment account	●	●	◐	◐	◐	●	●	⚠	●	🔒	👤
48	Use digital payment account and set up secure automatic payments for recurring transactions whenever possible	◐	●	●	●	◐	●	●	⚠	🏠	🔒	👤
49	Help prevent fraudulent activity by opting into security services provided by financial institutions, such as transaction alerts	◐	●	●	●	●	●	●	●	●	🔒	●
50	Participate in consumer interest groups to promote balanced and informed recommendations to industry decision-makers and policymakers.	◐	◐	◐	◐	◐	⚠	●	●	🏠	🔒	👤
51	Convey payment product preferences to financial institutions and merchants when provided with the opportunity	◐	◐	◐	◐	◐	●	●	●	🏠	●	👤

References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



Limited **access** to digital payment products



Security, risk and privacy concerns



Cultural and habitual attachment to cash



High impact: Can be implemented without delay and/or expected to significantly increase digital payments usage



Moderate impact: Can be implemented with some potential delays and/or expected to moderately increase digital payments usage

Low impact: Market has either already significantly implemented action or is not ready for implementation

Action Roadmap

Calls to Action: Digital Payment Service Providers

Proposed Calls to Action for Consideration: Digital Payment Service Providers

52	Tailor digital products to meet distinct customer needs		
53	Develop solutions that would support acceptance and usage of low-value digital transactions		
54	Improve Know Your Customer processes to reduce the burden on potential new customers, while complying with all applicable laws and regulations		
55	Undertake targeted financial literacy campaigns		
56	Educate merchants on the protections and payment certainty offered by accepting digital payments		
57	Implement processes that allow consumers to quickly and confidently address instances of fraud		
58	Implement payment acceptance technologies that offer security proportional to transaction risk		
59	Prioritize security standards in product development		
60	Offer consumers, merchants and other stakeholders opportunities to suggest product enhancements		
61	Explore cross-industry collaboration opportunities		

References:



Inadequate digital infrastructure



Misperception that **costs** of accepting digital payments are higher than cash



Limited **access** to digital payment products



Security, risk and privacy concerns



Cultural and habitual attachment to cash



High impact: Can be implemented without delay and/or expected to significantly increase digital payments usage



Moderate impact: Can be implemented with some potential delays and/or expected to moderately increase digital payments usage



Low impact: Market has either already significantly implemented action or is not ready for implementation

A photograph of a narrow, unpaved street in a low-income neighborhood. On the left, there is a small shop with a sign that reads "SORRISO DA CRIANÇA" and lists items like "Bolos", "Doce", "Sorvetes", "Biscoitos", and "Refrigerantes". The shop's exterior is decorated with a diamond-shaped tile pattern. A child in a red shirt is walking down the street in the distance. The street is flanked by simple, weathered buildings. The overall scene is dimly lit, suggesting an overcast day or late afternoon.

Key Findings by Level of Payments Maturity

Cash Centric

Category Overview

Mostly composed of cities from Central & Latin America, and Africa

- **Lagos**
- Algiers
- Luanda
- Buenos Aires
- Baku
- Dhaka
- Phnom Penh
- Bogota
- Santo Domingo
- Cairo
- Accra
- Kigali
- Jakarta
- Kingston
- Amman
- Astana
- Beirut
- Mexico City
- Monterrey
- Casablanca
- Karachi
- Panama City
- Lima
- Manila
- Hanoi

Key Characteristics

Relatively low income

Low access to formal financial services

Low digital payments infrastructure availability

Very low usage of digital payments

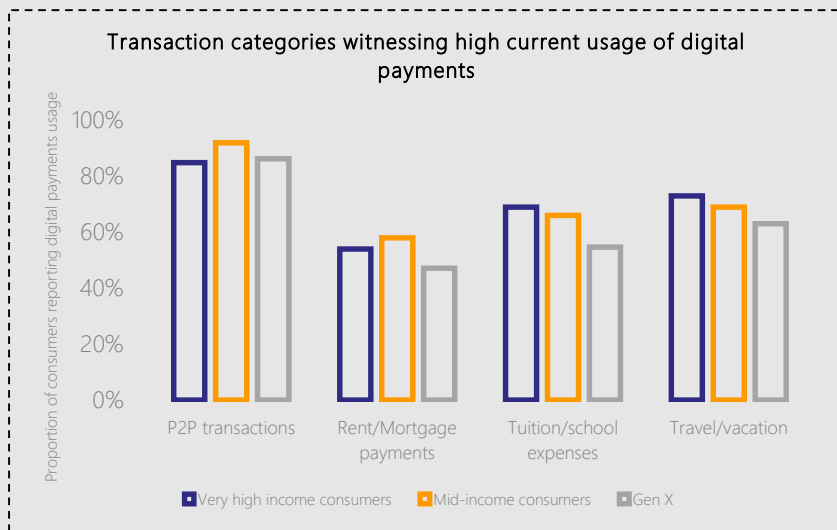
- Average GDP per capita of **USD 10,950**
- Average of **46.7%** of the urban population has an account at a formal financial institution
- Average of **29.2%** of the urban population has a debit card
- Average of **27** ATM machines per 100,000 residents
- On average, only **12.6%** have used debit cards in the past year
- Less than **5%** have on average, used other forms of digital payments in the past year
- Only **6.4%** have on average, received government benefits digitally

Cash Centric Cities

Average Impacts

Current usage in Lagos, a representative Cash Centric City

12% of consumers reported using only digital payments for transactions over the past month



Note: Income intervals broadly defined as follows – Mid-income: Between 340,000 and 510,000 Naira per year; Very high income: Above 1.3 million Naira per year.

Source: Roubini ThoughtLab Consumer Survey, Roubini ThoughtLab Analysis, & NiGEM Model

Achievable Cashless Impacts

How could Cash Centric cities benefit on average, if all stakeholders started transacting like the top 10% of users?

Potential annual average net benefits



Consumers

\$130 million
\$29 per adult per year



Business

\$1.8 billion net benefit
\$13,473 in average net benefits
per million dollars of revenue



Government

\$743 million
4% average increase in tax
revenue as a percentage of
baseline tax revenues

Potential average catalytic impacts (2017-2032)



GDP Growth

20 basis points
annual increase



Employment growth

91,500 new jobs
supported by 2032



Wages

0.1%
bump up in
average baseline
growth rate



Productivity

0.1%
bump up in average
baseline growth rate

Action Roadmap

Calls to Action for Cash Centric Cities



Actions recommended by different stakeholder type to drive a city along the digital payment maturity curve

Stakeholder	Some Calls to Action to Consider
 Consumers	- Establish a formal relationship with a financial institution and open a secure digital payment account - Convey payment product preferences to financial institutions and merchants when provided with the opportunity
 Merchants	- Accept digital payment methods that are widely used, secure and preferred by consumers - Train customer-facing staff on digital payment technology and security best practice
 Government (National and Sub-national)	- Offer secure digital payment solutions for government benefits to those that do not have bank cards - Implement policies aimed at accelerating digital payment use such as tax benefits and subsidies
 Payment Service Providers	- Implement processes that allow consumers to quickly and confidently address instances of fraud - Improve KYC processes to reduce the burden on potential new customers, while complying with applicable laws and regulations

Digitally Transitioning

Category Overview

Mostly composed of cities from Asia and Eastern Europe

- Bangkok
- Moscow
- St. Petersburg
- Minsk
- Bucharest
- Athens
- San Jose (CR)
- San Juan
- Santiago
- Caracas
- Montevideo
- Mumbai
- Bangalore
- Delhi
- Chennai
- Colombo
- Riyadh
- Ankara
- Istanbul
- Doha
- Muscat
- Nairobi
- Kiev

Key Characteristics

Income generally at the lower end

Moderate access to formal financial services

Moderate digital payments infrastructure availability

Low usage of digital payments

- Average GDP per capita of **USD 19,350**
- Little less than **75%** of the urban population on average, has an account at a formal financial institution
- An average of **55.6%** of the population has a debit card
- On average, **59** ATMs available per 100,000 citizens
- **25.4%** of the population has on average, used debit cards over the past year
- Less than **10%** have on average, used other forms of digital payments over the past year
- Nearly **10%** have received government benefits digitally

Sources: World Bank Index, McKinsey Urban World App, Roubini Thoughtlab Analysis

Digitally Transitioning Cities

Average Impacts

Current usage in Bangkok, a representative Digitally Transitioning City

Proportion of incoming payments (value) received digitally

Small businesses



Medium to very large businesses



■ Digital payments

Proportion of outgoing payments (value) made digitally

Small businesses



Medium to very large businesses



■ Digital payments

■ Physical payments

Source: Roubini ThoughtLab Business Survey, Roubini ThoughtLab Analysis, & NiGEM Model

Business sizes are based on number of employees. Small businesses: Less than 20 employees, Medium businesses: 20 to 50 employees, Large businesses: 50 to 250 employees. Very Large Businesses: Over 250 employees

Achievable Cashless Impacts

How could Digitally Transitioning cities benefit on average, if all stakeholders started transacting like the top 10% of users?

Potential annual average net benefits



Consumers

\$181 million
\$58 per adult per year



Business

\$1.6 billion net benefit
\$10,264 in average net
benefits per million dollars
of revenue



Government

\$996 million
4% average increase in tax
revenue as a percentage of
baseline tax revenues

Potential average catalytic impacts (2017-2032)



GDP Growth
16 basis points
annual increase



Employment
growth
26,000 new jobs
supported by 2032



Wages
0.1%
bump up in
average baseline
growth rate



Productivity
0.1%
bump up in average
baseline growth rate

Action Roadmap

Calls to Action for Digitally Transitioning Cities



Actions recommended by different stakeholder type to drive a city along the digital payment maturity curve

Stakeholder	Some Calls to Action to Consider
 Consumers	- Establish a formal relationship with a financial institution and open a secure digital payment account - Use a digital payment account and set up secure automatic payments for recurring transactions whenever possible
 Merchants	- Accept digital payment methods that are widely used, secure and preferred by consumers - Pay employees and suppliers electronically
 Government (National and Sub-national)	- Partner with innovative companies, other cities/regions, and research institutions to bring groundbreaking technology that can support digital payments to the city - Offer incentives for frequent ridership on an open-loop transit payment account¹¹
 Payment Service Providers	- Tailor products to meet distinct customer needs - Develop solutions that would support acceptance and usage of low-value digital transactions

Digitally Maturing

Category Overview

Mostly composed of cities from Asia

- Tokyo
- São Paulo
- Taipei
- Osaka
- Ulaanbaatar
- Shenzhen
- Tianjin
- Shanghai
- Beijing
- Kuala Lumpur
- Prague
- Lisbon
- Zurich
- Bratislava
- Rome
- Budapest
- Belgrade
- Warsaw
- Brasilia
- Dubai
- Kuwait City
- Tehran
- Durban
- Johannesburg

Key Characteristics

Moderate incomes catching up with developed economies

Moderate - High levels of access to formal financial services

Moderate digital payments infrastructure availability

Low-Moderate usage of digital payments

- Average GDP per capita of USD 33,817
- **84.7%** of the urban population on average has access to a formal financial institution account
- **70%** have on average, access to a debit card
- **70** ATMs per 100,000 citizens available on average
- On average, **44.8%** have used debit cards over the past year
- Nearly **24%** have used other digital payments over the last year
- Only **23%** have received government payments digitally

Digitally Maturing Cities

Average Impacts

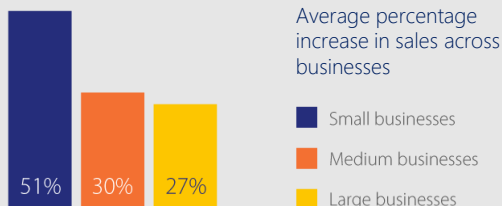
Current usage in Tokyo & Sao Paulo, representative Digitally Transitioning Cities

In Tokyo, digital payments adoption is driven by mid-income consumers for some recurring bills

Proportion of respondents reporting digital payments usage



Small to large businesses in São Paulo have gained substantially from accepting digital payments



Source: Roubini ThoughtLab Business Survey, Roubini ThoughtLab Analysis, & NiGEM Model

Business sizes are based on number of employees. Small businesses: Less than 20 employees, Medium businesses: 20 to 50 employees, Large businesses: 50 to 250 employees.

Achievable Cashless Impacts

How could Digitally Maturing cities benefit on average, if all stakeholders started transacting like the top 10% of users?

Potential annual average net benefits



Consumers

\$307 million
\$53 per adult per year



Business

\$5.2 billion net benefit
\$10,232 in average net benefits
per million dollars of revenue



Government

\$1.6 billion
2% average increase in tax
revenue as a percentage of
baseline tax revenues

Potential average catalytic impacts (2017-2032)



GDP Growth
19 basis points
annual increase



Employment
growth
41,700 new jobs
supported by 2032



Wages
0.2%
bump up in average
baseline growth rate



Productivity
0.2%
bump up in average
baseline growth rate

Action Roadmap

Calls to Action for Digitally Maturing Cities



Actions recommended by different stakeholder type to drive a city along the digital payment maturity curve

Stakeholder	Some Calls to Action to Consider
 Consumers	- Use a digital payment account and set up secure automatic payments for recurring transactions whenever possible - Help prevent fraudulent activity by opting into security services provided by financial institutions, such as transaction alerts
 Merchants	- Adopt frictionless and secure digital payment technology - Consider cash-free check-out lanes for customers using digital payments
 Government (National and Sub-national)	- Promote a fair, competitive marketplace for all financial institutions - Establish a pro-innovation financial consumer protection framework
 Payment Service Providers	- Implement payment acceptance technologies that offer security proportional to transaction risk - Educate merchants on the protections and payment certainty offered by accepting digital payments

Digitally Advanced

Category Overview

Mostly composed of cities from Europe and the US

- Chicago
- Vienna
- Brussels
- Paris
- Hong Kong
- Dublin
- Tel Aviv
- Amsterdam
- Oslo
- Singapore
- Seoul
- Barcelona
- Madrid
- Austin
- San Francisco
- Washington DC
- New York City
- Berlin
- Frankfurt

Key Characteristics

High incomes

- Average GDP per capita of **USD 54,807**

Relatively high access to formal financial services

- **96.5%** of the urban population on average has an account at a formal financial institution
- **83.7%** on average, have access to debit cards

High digital payments infrastructure availability

- Nearly **126 ATMs** per 100,000 citizens on average

Relatively high usage of digital payments

- On average, over **70%** have used debit cards over the past year
- Close to **60%** have on average, used other digital payments over the past year
- Nearly **41%** have on average, received government payments digitally

Digitally Advanced Cities

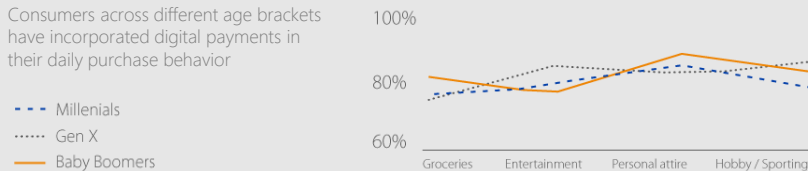
Average Impacts

Current Usage In Chicago, A Representative Digitally Advanced City

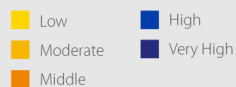
Over 11% of millennials reported using only digital payments to make purchases over the past month

Proportion of consumers reporting using digital payments

Consumers across different age brackets have incorporated digital payments in their daily purchase behavior



Consumers across all income groups overwhelmingly prefer digital payments for travel and vacation-related expenses



Source: Roubini ThoughtLab Consumer Survey, Roubini ThoughtLab Analysis, & NiGEM Model

Note: Income intervals broadly defined as follows – Low income: Below \$21,800; Moderate income: Between \$21,800 and \$32,700; Mid-income: Between \$32,700 and \$81,200; High-income: Between \$81,200 and \$174,300; Very high income: Above \$174,300

Achievable Cashless Impacts

How could Digitally Maturing cities benefit on average, if all stakeholders started transacting like the top 10% of users?

Potential annual average net benefits



Consumers

\$493 million
\$110 per adult per year



Business

\$3.3 billion net benefit
\$5,172 in average net benefits
per million dollars of revenue



Government

\$2.1 billion
2% average increase in tax
revenue as a percentage of
baseline tax revenues

Potential average catalytic impacts (2017-2032)



GDP Growth
21 basis points
annual increase



Employment
growth
29,000 new jobs
supported by 2032



Wages
0.2%
bump up in average
baseline growth rate



Productivity
0.2%
bump up in average
baseline growth rate

Action Roadmap

Calls to Action for Digitally Advanced Cities



Actions recommended by different stakeholder type to drive a city along the digital payment maturity curve

Stakeholder	Some Calls to Action to Consider
 Consumers	- Use a digital payment account and set up secure automatic payments for recurring transactions whenever possible - Help prevent fraudulent activity by opting into security services provided by financial institutions, such as transaction alerts
 Merchants	- Adopt frictionless and secure digital payment technology - Consider cash-free check-out lanes for customers using digital payments
 Government (National and Sub-national)	- Promote a fair, competitive marketplace for all financial institutions - Establish a pro-innovation financial consumer protection framework
 Payment Service Providers	- Implement payment acceptance technologies that offer security proportional to transaction risk - Educate merchants on the protections and payment certainty offered by accepting digital payments

Digital Leader

Category Overview

Mostly composed of cities from Europe

- **Stockholm**
- London
- Helsinki
- Copenhagen
- Ottawa
- Toronto
- Canberra
- Sydney
- Auckland

Key Characteristics

High incomes

Nearly fully-banked population

Very high availability of digital payment infrastructure

High usage of digital payments

- Average GDP per capita of **USD 58,844**
- **99.7%** of the population has on average, an account with a formal financial institution
- On average, close to **95%** have debit cards
- Close to **120 ATMs** per 100,000 citizens on average
- On average, over **88%** have used debit cards over the past year
- Nearly **80%** have on average, used other digital payments over the past year
- **61.7%** have received government payments digitally

Digital Leader Cities

Average Impacts

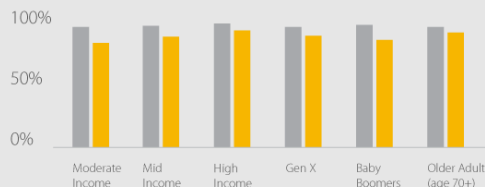
Current Usage In Stockholm, A Representative Digital Leader City

Over 80% of recurring bills and daily purchases are paid for through digital payments by mid-high income and older working age consumers

Proportion of payments made digitally

Consumers across different age brackets have incorporated digital payments in their daily purchase behavior

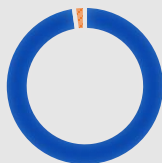
■ Recurring bills
■ Daily Purchases



Government*

The government has digitized almost all of its payments to citizens.

*As reported by citizens



■ Digital Payments
■ Physical Payments

Achievable Cashless Impacts

How could Digitally Leader cities benefit on average, if all stakeholders started transacting like the top 10% of users?

Potential annual average net benefits



Consumers

\$407 million
\$139 per adult per year



Business

\$4.8 billion net benefit
\$10,855 in average net benefits per million dollars of revenue



Government

\$1.1 billion
1% average increase in tax revenue as a percentage of baseline tax revenues

Potential average catalytic impacts (2017-2032)



GDP Growth
27 basis points
annual increase



Employment growth
13,600 new jobs
supported by 2032



Wages
0.3%
bump up in average
baseline growth rate



Productivity
0.3%
bump up in average
baseline growth rate

Source: Roubini ThoughtLab Consumer Survey, Roubini ThoughtLab Analysis, & NiGEM Model

Note: Income intervals broadly defined as follows – Moderate income: Between 180,000 and 289,000 kronor; Mid-income: Between 289,000 and 434,000 kronor; High-income: Between 434,000 and 1.1 million kronor.

Action Roadmap

Calls to Action for Digital Leader Cities



Actions recommended by different stakeholder type to drive a city along the digital payment maturity curve

Stakeholder	Some Calls to Action to Consider
 Consumers	- Help prevent fraudulent activity by opting into security services provided by financial institutions, such as transaction alerts - Participate in consumer interest groups to promote balanced and informed recommendations to industry decision-makers and policymakers
 Merchants	- Consider cash-free checkout lanes for customers using digital payments - Adopt frictionless and secure digital payment technology
 Government (National and Sub-national)	- Ensure new market players meet established industry standards - Share best practices for transitioning to secure digital payments that create value for all stakeholders
 Payment Service Providers	- Develop solutions that would support acceptance and usage of low-value digital transactions - Explore cross-industry collaboration opportunities



Gracias!