

# E-ID: Behind the scenes of national electronic identification systems

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# My teaching

- Digital Technologies and Data-Driven Business
- Strategic and tactical tools for e-business
- Fundamentals of Information Systems
- eBusiness and Communication Management in Services
- Mobile Business Strategy – Making Profits from the Wireless Revolution

# Rony's research

- Digital Government
- Artificial Intelligence in Government
- Blockchain
- Government and Social Media
- E-democracy / E-participation

More info on: [www.cbs.dk/en/staff/rmdigi](http://www.cbs.dk/en/staff/rmdigi)

## E-ID: Behind the scenes of national electronic identification systems





## NEM ID

[www.nemid.nu](http://www.nemid.nu)

Bruger-id

Cpr-nr., NemID-nr. eller  
selvalgt bruger-id

Adgangskode

## NEM ID

**Indtast nøgle**

Nøglekort: D037-199-161

#	
3726	<input type="text"/>

Du har 146 nøgler tilbage.

[Skift til nøgleviser](#)

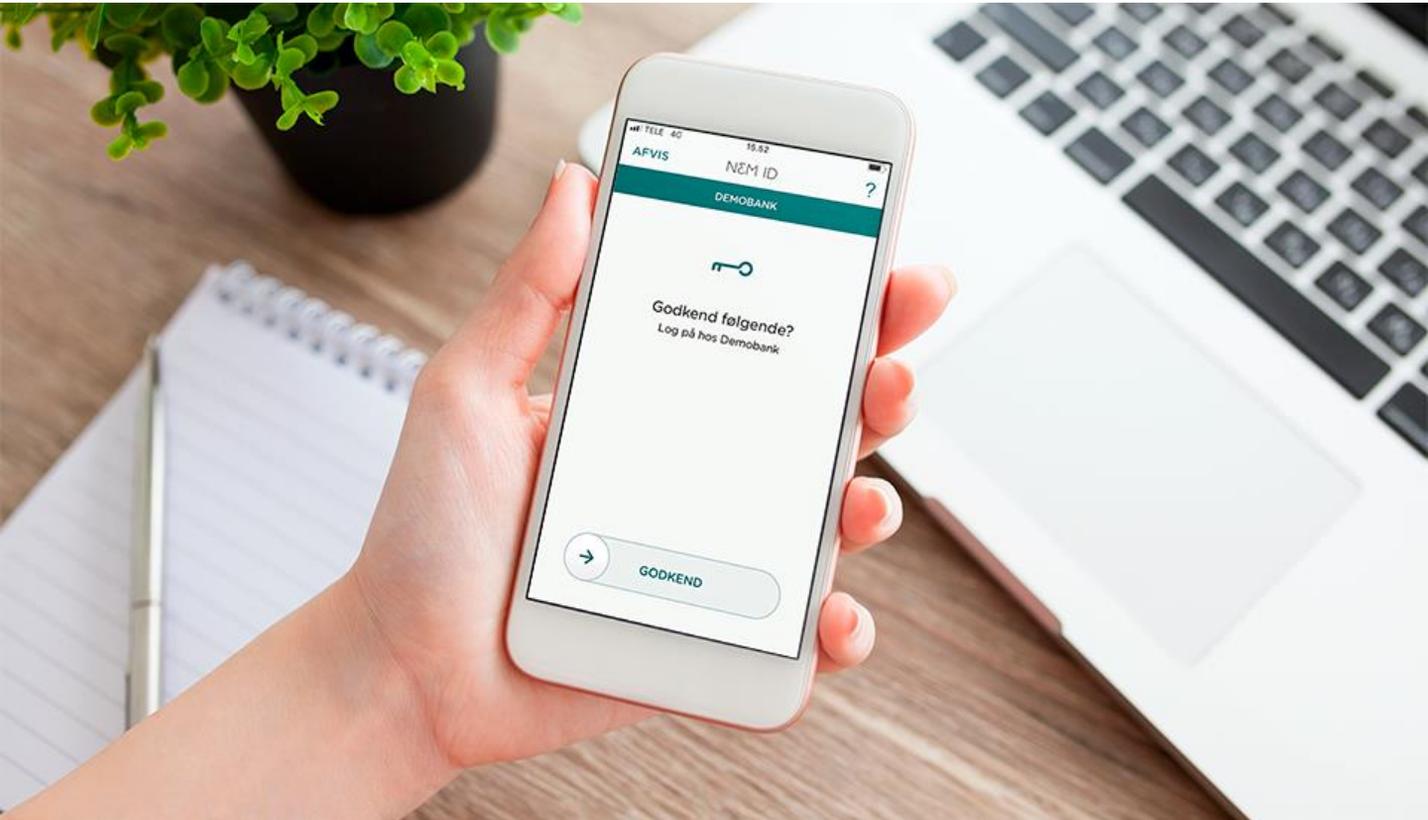
## E-ID: Behind the scenes of national electronic identification systems



# NEM ID



## E-ID: Behind the scenes of national electronic identification systems



borger.dk



Digital Post



Min Side



Log på



Søg



## Tilmeld dig brugerpanelet

Hjælp os med at forbedre digitale løsninger



## Hent NemID nøgleapp

Dit digitale supplement til nøglekortet



## Opgørelse af boligstøtte

Din boligstøtte bliver gjort op for 2018



## Genveje

Få feriepenge udbetalt

Det blå EU-sygesikringskort

Barsel

Kontanthjælp

Folkepension

Straffeattester

Børnepasning

Boligstøtte

Søg SU

Flytning

Studiegæld

Ansøg om eller forny dansk pas

Robinsonlisten



## Alle emner

# E-ID: Behind the scenes of national electronic identification systems

**bet365**

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- Du skal åbne en konto og indbetale 100 kr. eller mere for at kvalificere dig til et 100% matchende beløb, som en bonus du kan spille med, op til et maksimum på 1.000 kr.
- For at kunne spille for din bonus skal du gennemspille din kvalificerende indbetaling én gang. Indbetalinger, som foretages ved brug af NETeller, Skrill eller Skrill 1-Tap gælder ikke som din kvalificerende indbetaling.
- Før du kan foretage en udbetaling skal du have afsluttede væddemål (eksklusive væddemål der er blevet lukket) til værdien af tre gange din kvalificerende indbetaling og bonus.
- Væddemål, som ikke har mindst et valg til odds 1.50 (1/2) eller højere, tæller ikke med i gennemspilskravet.
- Hvis gennemspilskravene for dette tilbud ikke opfyldes indenfor 90 dage, efter du gjorde krav på dit tilbud, vil det ikke være muligt at udbetale din bonus og/eller gevinster, som er tilskrevet denne.

Se samtlige regler og vilkår for tilbuddet nedenfor

# Government + banking sector



## E-ID: Behind the scenes of national electronic identification systems

Ben Eaton



Rony Medaglia



Jonas Hedman



- Eaton, B., Hedman, J., & Medaglia, R. (2018). Three different ways to skin a cat: Financialization in the emergence of national e-ID solutions. *Journal of Information Technology*, 33(1), 70–83.
- Medaglia, R., Hedman, J., & Eaton, B. (2017). Public-Private Collaboration in the Emergence of a National Electronic Identification Policy: The Case of NemID in Denmark. *Proceedings of the Hawaii International Conference on System Sciences (HICSS-50)*, 2782–2791.
- Medaglia, R., Hedman, J., & Eaton, B. (2017). It Takes Two to Tango: Power Dependence in the Governance of Public-Private e-Government Infrastructures. *International Conference on Information Systems*.

## The history of Danish Electronic Identification (e-ID)

# Early vision (1992-2001)

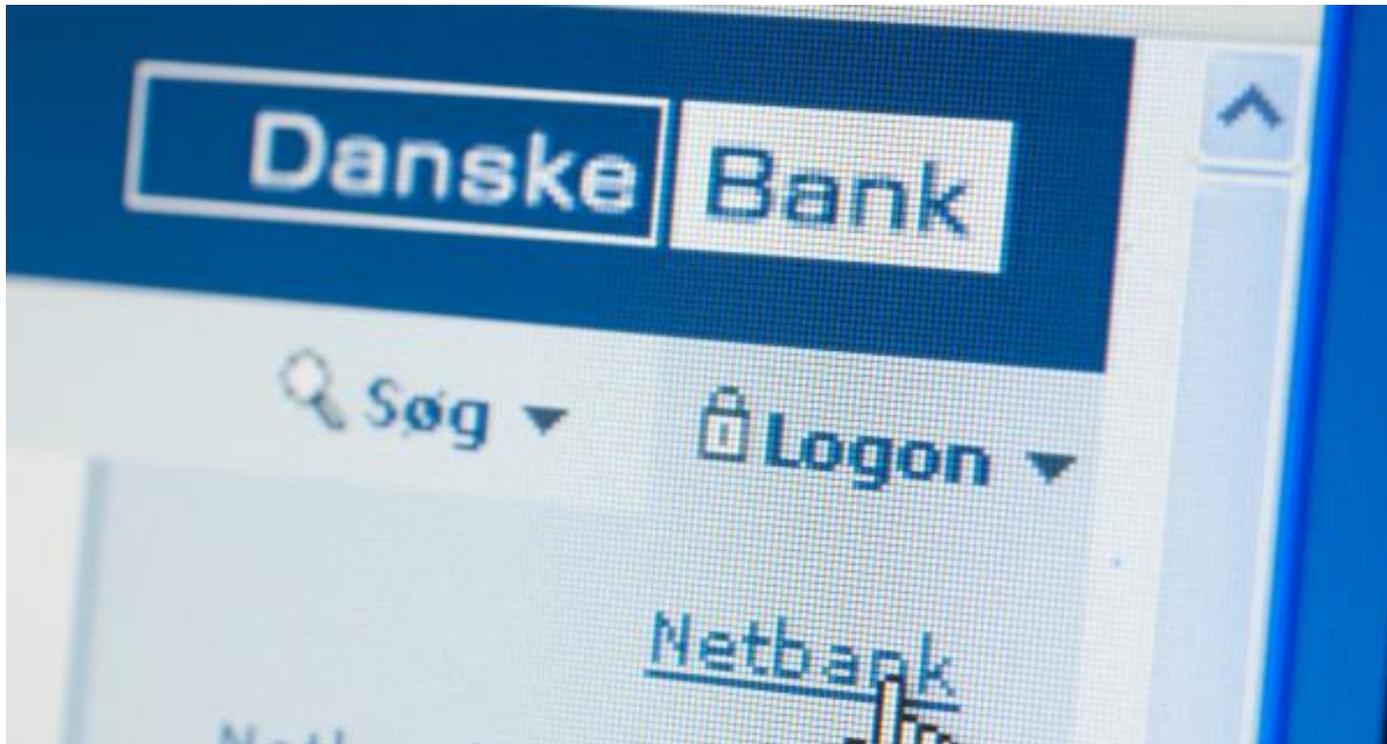
- 1968: IT-based Central Persons Registration (CPR) Number
- 1992: First proposal of a multi-purpose electronic ID card
- 1996: Second proposal failed due to technical difficulties and lack of standards

## The history of Danish Electronic Identification (e-ID)

# Parallel development (2001-2008)

- 2001: Digital Task Force (DTF) established (hosted by the Ministry of Finance)
- 2003: First public tender for digital signature implementation won by former state telecom company TDC
- In the meanwhile, **banks** roll out authentication system "netID"

## E-ID: Behind the scenes of national electronic identification systems



## The history of Danish Electronic Identification (e-ID)

# Parallel development (2001-2008)

- 2007: Roll out of borger.dk portal
- 2007: Roll out of EasyLog-in
- Software-based digital signature
- 2008: EasyLog-in users: 250.000, netID users: 2,2 million

## Regional health card



## Log in system for income tax report



## The history of Danish Electronic Identification (e-ID)

# Strategic partnership with the banking sector (2009-today)

- 2009: Second public tender for digital signature implementation won by **bank consortium** PBS.
- 2010: All ministries are required to use digital signatures, and all invoices to public institutions must be electronic.
- 1 July 2010: NemID solution kicked off.
  - Two-factor identification solution:  
username/password + one time password
- 2011: **3,5 million** NemID users

# Research question



*What are the **factors** that shape the **power dependence** between public and private actors engaged in establishing the **governance** of a shared e-ID system?"*

# Power Dependence Theory

- Power is present in **all relationships**
- Power of actor A over B is a function of the **dependence** of B on A
- Dependence is a consequence of the value that A places on the **resources** of B

# “It takes two to tango”



1. “Getting to the dancehall”



2. “Asking for a dance”



3. “How does the dance go”

## Parallel development (2001-2008)

### 1. “Getting to the dancehall”

No power dependence:

- Banks possess own infrastructure (except for the CPR)
- Government pursue goal of universal citizen access

## Strategic partnership with the banking sector (2009-today)

### 2. “Asking for a dance”

- Government needs banks’ growing user base
- Banks want to draw on CPR infrastructure to achieve scope

# What happened in the meanwhile...

Four types of factors shaping the power balance between the government and the banks:

- Market factors
- Technology factors
- Regulation factors
- Social norm factors

# Market factors

## Words from an interviewee...

*“The market has changed dramatically since the last solution was made in 2010.*

*And that's because the banks face more **competition** between themselves, and also from new competitors entering the market”*

# Market factors



# Market factors

## Words from an interviewee...

*"There are two very **large banks** and a lot of very small banks. For the smaller banks it's very important that the large banks are not running away.*

*We've had this situation with the Mobile Pay service where we saw Danske Bank build its **own solution**"*

# Market factors



May 2013 – Danske Bank launches  
Mobile Pay

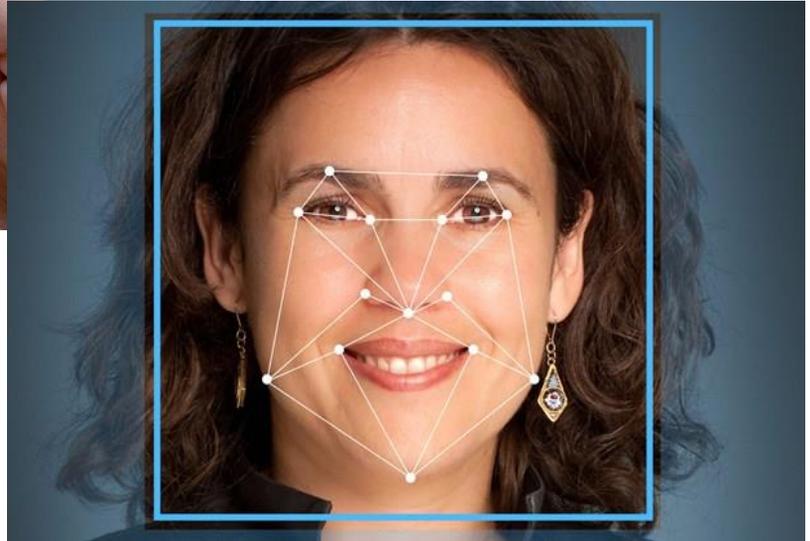
# Technology factors

## Words from an interviewee...

*“The banking sector provision time demands **new solutions** not every day, but perhaps every month, and they want the freedom to make changes.*

*In contrast, you have the **public sector** that doesn't take **any risks**, as they have to protect personal data and so on. The banks may be getting tired of this cooperation.”*

# Technology factors



# Regulation factors

## Words from an interviewee...

*“The biggest problem for the banks is to understand the **public tender**.*

*It has been so **complicated** for them and they have no experience with doing a tender in an EU-regulated way.”*

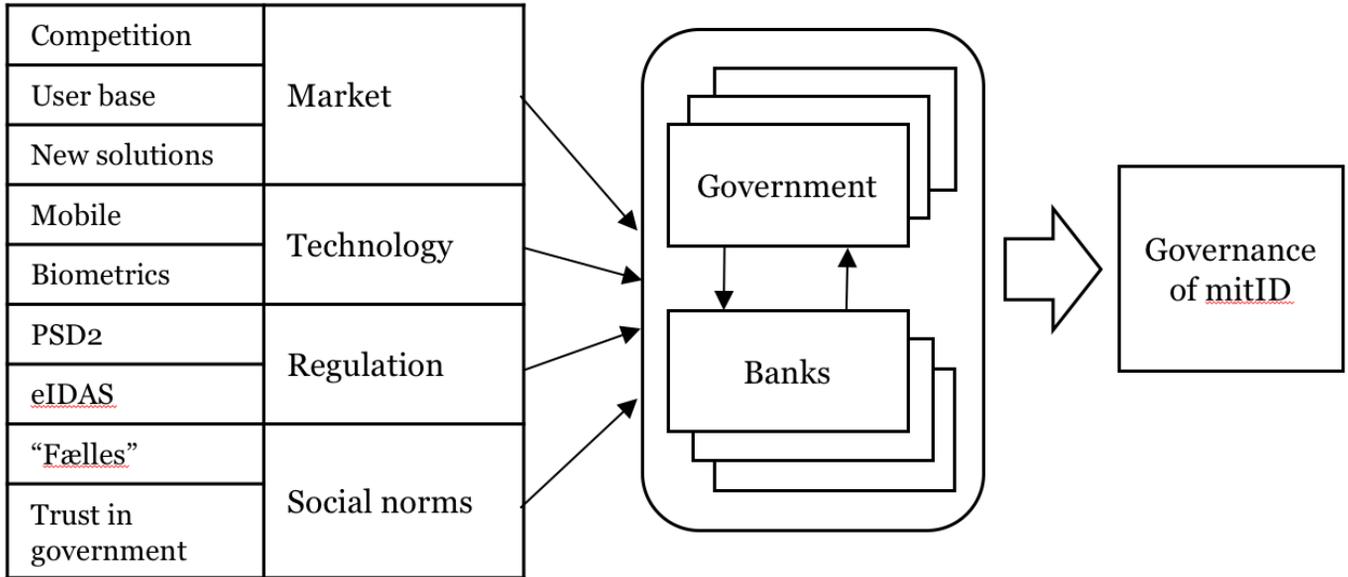
# Regulation factors

- EU regulation
  - 2nd Payment Services Directive (PSD2) opening national markets to European-wide competition
  - EU directive No. 910/2014 (eIDAS) mandating cross-national competition in eID system

## Social norm factors

- Danish cultural concept of ***fælles*** (“shared”) public-private collaboration is becoming less common
- Danish users start demanding higher standards of **privacy** and security in the interactions with the state

# E-ID: Behind the scenes of national electronic identification systems



## Words from an interviewee...

*"The public sector fears that the banks create their own solution.*

*They will lose whatever they have built in the last seven to eight years.*

*The banks have the popular applications and the public sector needs a lot of people enrolled in this system"*

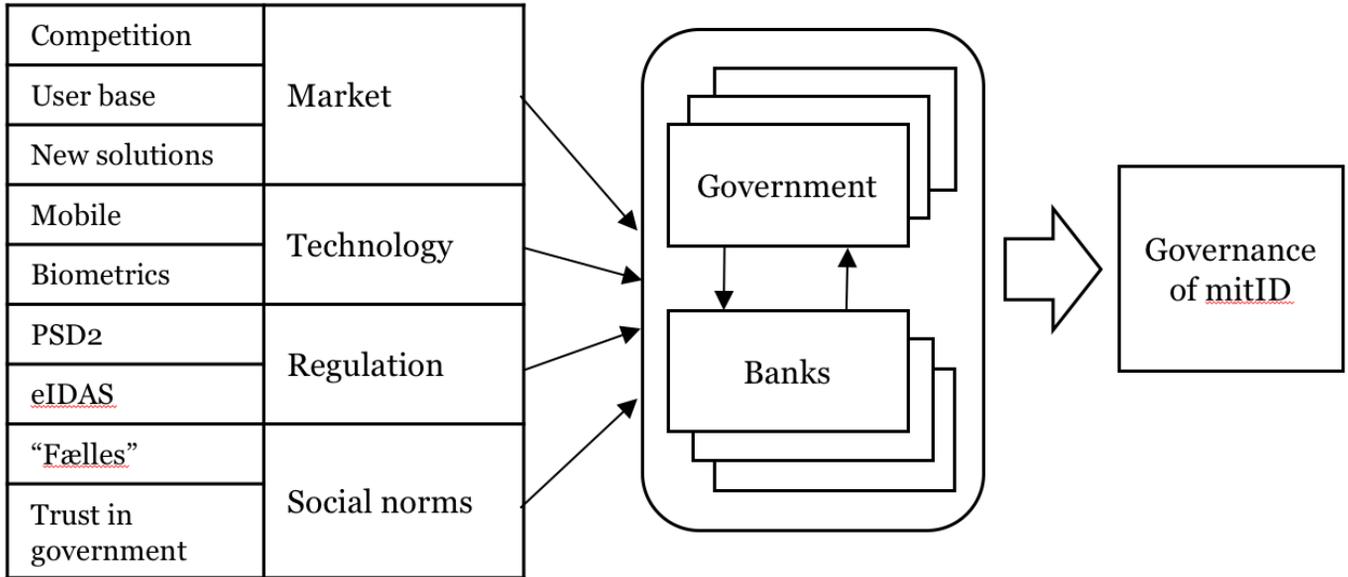
## Words from an interviewee...

*“The government needs the banks, but the banks maybe don’t need the government anymore”*

# 3. “How does the dance go” Towards a new e-ID system

- New public tender process for the new e-ID system
- NemID -> MitID
- Tender won by Nets (March 2019)
- MitID rollout 2020-2021

# E-ID: Behind the scenes of national electronic identification systems



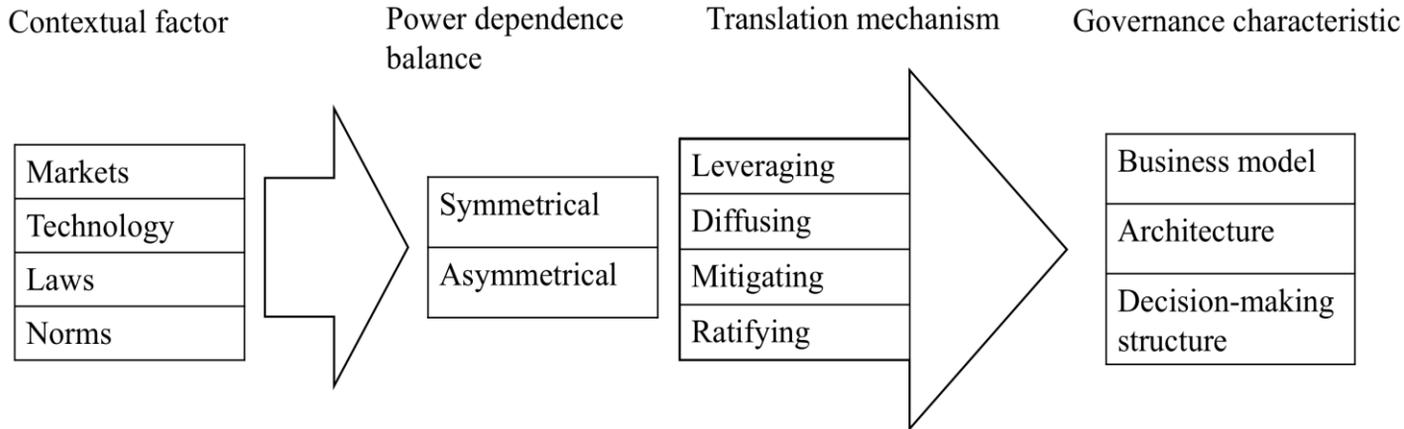
## E-ID: Behind the scenes of national electronic identification systems

Contextual factors		Power dependency	MitID governance characteristics
<b>Regulation</b>	EU procurement law mandating open tender process and partnership with private actors	The bank sector must comply to national & EU law	Compromise and compensation built into the solution
<b>Markets</b>	Public sector's need to "piggyback" on expanding user base of banking services	The government needs the banks' user base	Multi-sided transaction platform business model
		Smaller banks need the government as champion	Architecture modularity
		Possibility of larger banks to develop their own identification solution	

## E-ID: Behind the scenes of national electronic identification systems

Contextual factors		Power dependency	MitID governance characteristics
<b>Norms</b>	Public sector's need to be seen to strive for cost reductions via public-private partnerships	Banks need to be seen to cooperate with government  Government needs to be seen to cooperate with private sector	Light-weight decision-making structures
<b>Technology</b>	Public sector's need of banks' greater responsiveness to evolving technology	Possibility of larger banks to develop their own identification solution	Architecture modularity

# PPP governance characteristics as response to contextual factors



## E-ID: Behind the scenes of national electronic identification systems

	Market factors response	Technology factors response	Legal factors response	Norms factors response
	<b>Leveraging</b> power dependence	<b>Defusing</b> power dependence	<b>Mitigating</b> power dependence	<b>Ratifying</b> power dependence
<b>PPP governance model</b>	MitID's <b>business model and architecture modularity</b> to provide a win-win solution for public and private actors' mutual needs	MitID's <b>architecture modularity</b> to avert the possibility of private actors using latest technology to develop an independent solution	<b>Negotiation-based benefits</b> ensured to private actors as a compensation for complying with costly regulatory requirements	<b>Light-weight decision-making structures</b> drawing on culturally-rooted assumptions on public-private partnerships and trust built up from long standing familiarity amongst stakeholders

# Implications for practice

1. Devise governance mechanisms that can **diffuse tensions** between actors
2. **No “one size fits all”** PPP governance model

# Thank you for your attention

**Questions?**

**Comments?**

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