Community broadband networks and rural digital divide: A UK case study

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Outline

- Types and characteristics of community broadband networks
- The digital divide as a market failure
- Methodology
- The rural digital divide in the UK
- Findings from Broadband for the Rural North (B4RN)
- Conclusion & future research

Community broadband networks: in search of a definition

- ✓ Community broadband networks refer to **broadband infrastructure developed by "interested, concerned, and technologically able citizen and community groups"** (Tapia, Powell, & Ortiz, 2009, p. 355).
- ✓ They differ from both public and commercial providers, as they are **privately funded but managed as non-profit cooperatives** (Gerli et al., 2017).
- ✓ An **alternative to commercial ISPs** for the provision of **affordable broadband** (Middleton & Bryne, 2011)
- ✓ A **solution to both market and government failures** in the provision of broadband access in (Sadowski, 2017; Salemink & Strijker, 2018).

Community broadband network: strengths and weaknesses

The **reliance on the human and financial resources existing within local communities** (Gerli et al., 2017; Shaffer, 2017) may **undermine the long-term sustainability** of community projects along with their **inability to manage exogenous policy and market shocks** (Salemink & Strijker, 2016; Shaffer, 2017).

- ✓ Community networks **in a rural context** are expected **to enhance local development and resilience** (Ashmore, Farrington, & Skerratt, 2015; Salemink & Strijker, 2016).
- ✓ Community Wi-Fi networks **in an urban context** failed to promote digital inclusion as they **struggled to engage with digitally illiterate users** (Powell & Shade, 2006; Tapia et al., 2009).

How do community networks contribute to address the rural digital divide?

The rural digital divide: a theoretical perspective

Access divide

Due to the **high fixed costs and economies of scale** typical of broadband networks (Grubesic, 2008; Glass & Stefanova, 2012), **commercial providers do not invest in rural and remote areas**

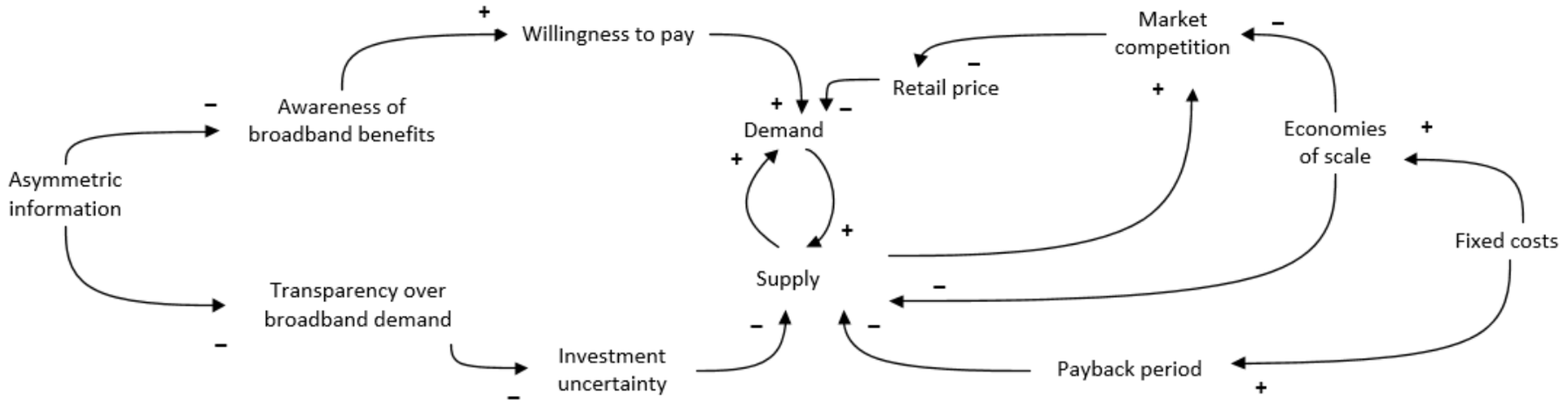
Adoption divide

The **use of broadband** in rural areas is **inhibited by** the **lack of broadband access and socio-economic factors**, such as the lack of human capital and the ageing population (Malecki, 2003; Preston, Cawley, & Metykova, 2007).

Outcome divide

It accrues from the **different benefits to be derived from the use of digital technologies** (Kwok-Kee, Hock-Hai, Hock Chuan, & Tan, 2011). It is largely unexplored in the context of rural areas.

Digital divide as a market failure



How do community broadband networks address the market failures underlying the rural digital divide?

Methodology

As recommended by Yin (2009), a **single case analysis** is here employed **to explore a relatively new and geographically circumscribed phenomenon** such as community NGA networks in rural areas.

The construct validity of the case study is enhanced by the **triangulation of multiple qualitative methods** (Ammenwerth, Iller, & Mansmann, 2003).

- **3 interviews** with **internal stakeholders** to understand the functioning of community networks
- **8 interviews** with **external stakeholders** to explore the outcomes of these initiatives
- **4 sources of ethnographic data**
- **Secondary data**: business plans, annual reports, newsletters, etc.

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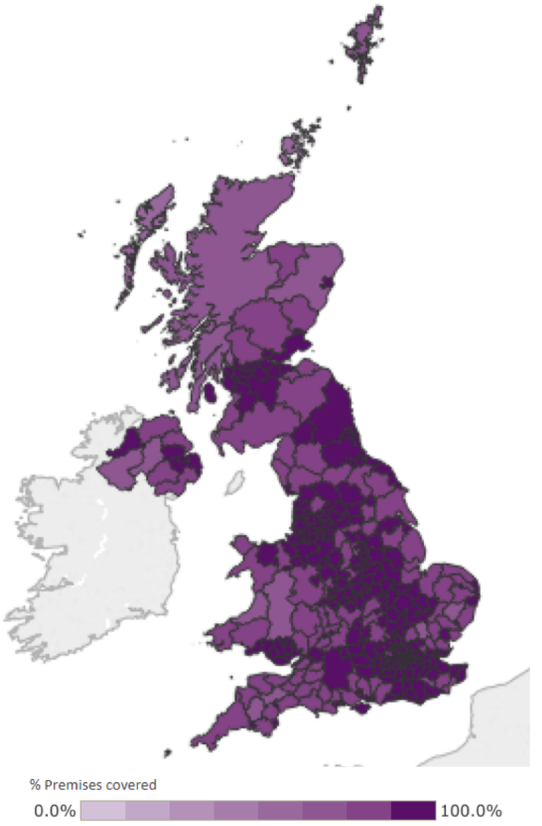
The rural digital divide in the UK

- **91%** of the **UK premises** covered by **superfast broadband** (30 Mbit/s) as of May 2017

…BUT…

- **34%** of the **UK rural premises** had **no access to superfast broadband**
- **17%** of these were provided with a **download speed lower than 10 Mbit/s**



As of May 2017:

- **82%** of the **UK premises** had adopted **fixed broadband**
- **38%** of the **UK premises** had subscribed to **superfast services**

…BUT…

- **As of 2017, 9%** of the **UK adult population** had **never used the Internet**
- a survey by Farrington et al. (2015) revealed that **non-users are more frequent in deep rural areas**, especially among the over 65 years old age group.

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Interventions against the rural digital divide in the UK

Since 2011, **Broadband Delivery UK (BDUK), a nation-wide programme** run by the national government in partnership with local authorities, has allocated **£780 m to subsidise private investment** and reach **95% superfast broadband coverage**

In 2016, the **UK government** launched a reform of the **Universal service** to provide everyone with **a minimum download speed of 10 Mbit/s**

Both **private** and **community-led initiatives** have targeted **rural areas left behind by BDUK** (Gerli, Wainwright & Whalley, 2017). **Some** of them, such as Gigaclear, have **benefitted from public subsidies** while **others**, such as B4RN, are **privately-funded**.

Broadband for the Rural North (B4RN)

A **community-led initiative** started in 2011 to cover 8 parishes in Lancashire. As of September 2017, their **FTTH network** had **42 nodes across Northern England** and further 15 under construction.

- ✓ **Each community** has to **aggregate demand** and **collect enough funding to cover 100% of the premises** in the parish.
- ✓ **Fibre is laid by volunteers** into soft land and landowners are required to give **free wayleaves**.
- ✓ This has reduced the **cost per premise down to £700.**
- ✓ B4RN also run a **weekly IT club** and organise **occasional trainings** on specific themes, such as online shopping or editing photo.

A strong commitment to digital inclusion…

B4RN is **committed to provided 100% inclusivity** and to promote the take-up of digital services within the targeted parishes.

> "If you are going to do your parish, you do the whole parish, or you don't do it"

(Interview 1)

The **average take-up** across the projects is **65%**.

> "The participants to the IT Club were elderly people whose familiarity with technology varied significantly. The assistance provided by the volunteers was not limited to B4RN's services and devices, but extended to generic support with IT-related issues".

(Observation 3 & 4)

B4RN has enabled rural residents and businesses to **take advantage of digital technologies and online services**

> "however downloading picture, being able to stream online, is an enormous game changer for our business, because our operations is now transferring, these have to be practically 80% online".

(Interview 8)

… depending on the will and resources of local communities

B4RN **was initially meant to obtain funding from BDUK** but renounced to **public subsidies** because they were perceived as **a threat to the project**

> "if we had brought those people in and those people were telling us, the volunteers, what to do, and we knew it was wrong, we would have all left, we wouldn't have carried on working for nothing"

(Interview 1)

The **reliance on volunteers** enables B4RN to **achieve economies** in FTTH rollout but poses a number of **contraints to the sustainability and replicability** of its model

> "when we actually started digging, we got nearly a hundred that might volunteer. Experience so far has shown that you don't get very many people turning up for the work days"

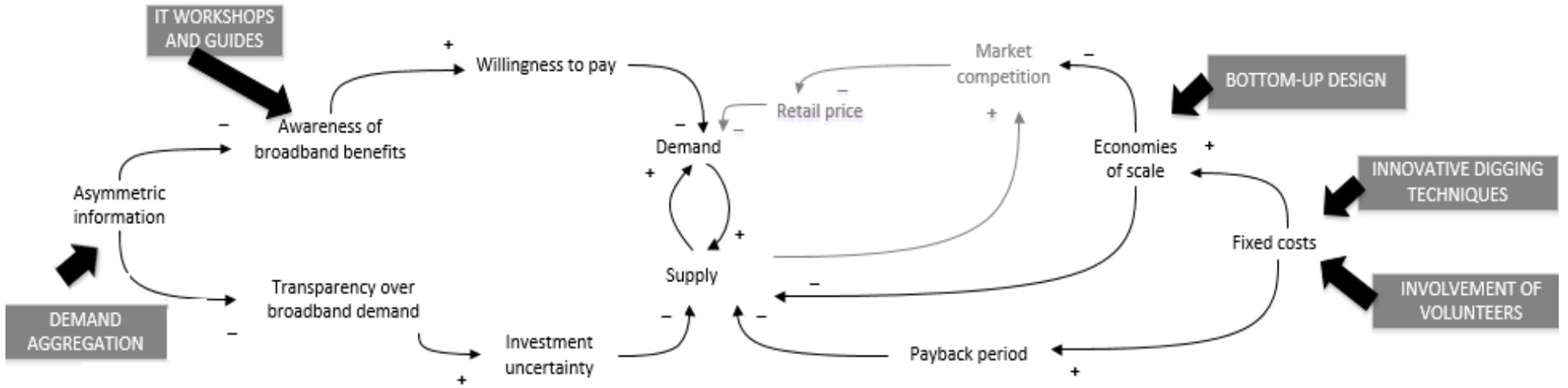
(Interview 2)

> "their expansion across the whole of the County would be a very very slow process. And they don't have the investment potential of someone like BT to do the big projects".

(Interview 7)

B4RN: a successful model to expand fibre coverage…

The model adopted by **B4RN addressed market failures on the supply side** through **demand aggregation** and the **involvement of volunteers** in the **design** and **deployment** of the network



As a result, B4RN **succeeded in expanding superfast broadband coverage and ensure universal access to FTTH in the targeted communities.**

… but the sustainability and replicability of this model is arguable

The **overall impact** of this community broadband network upon the digital divide in the UK has been **constrained by its small scale.**

Although B4RN has constantly expanded over the years, its **coverage** is still **limited in terms of geographic scope and number of connected premises.**

The **reliance on voluntary work and private funding** implies that the approach followed by B4RN is **viable only for communities that "have got the ability, have got the money to do this"** (Interview 5).

As a consequence, B4RN 's **"is still maintaining an inequitable position for rural communities"** (Interview 6)

Conclusions

The **alternative model** adopted by B4RN has enabled them to **successfully address the market failures on the supply of superfast broadband** and **solve the digital divide *within* rural communities.**

On the other hand, being **reliant on the skills and resources of locals**, this model may **perpetuate the digital divide *between* rural communities.**

Nevertheless, this **case study reinforced the view that:**

- **rurality per se does not imply a lower demand** (Farrington et al., 2015; Scheerder et al., 2017)
- **The involvement of local communities is crucial for the success of broadband projects (**Warren, 2007; Po-An Hsieh, Keil, Holmström, & Kvasny, 2012).

Future research

The focus on a single case limits the generalizability of this study, thereby calling for further research to **include and compare multiple community networks in and outside the UK.**

Further research is also needed to:

- **Understand the contextual factors that help community networks to flourish** and what role public authorities can play to encourage these initiatives;

- Explore the impact of public and community-led initiatives upon the rural digital divide, to **assess whether the impact of digital technologies varies across different intervention models.**

Thanks for your attention

Any question?

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