Information Economics and Policy 29 (2014) 46–57

Contents lists available at ScienceDirect

Information Economics and Policy

journal homepage: www.elsevier.com/locate/iep

The impact of electronic financial payments on crime

Laura E. Armey *, Jonathan Lipow [1], Natalie J. Webb [2]

Naval Postgraduate School, 699 Dyer Road, Bldg 234, Monterey, CA 93943, United States

ARTICLE INFO

Article history:
Received 7 March 2013
Received in revised form 20 August 2014
Accepted 15 October 2014
Available online 31 October 2014

JEL classification:
G21
K42
O3

Keywords:
Electronic financial transactions
Crime
Cashless economy

ABSTRACT

In this paper, we test the hypothesis that access to electronic payments may reduce crime. Our results suggest that there is a negative and significant statistical relationship between access to electronic payments and the incidence of economic crimes such as robbery and burglary, while electronic transactions do little to reduce the incidence of non-economic crimes such as homicide and rape. This paper provides evidence that policies and technologies that enable the proliferation of cashless transactions have the desired impact of deterring crime.

Published by Elsevier B.V.

1. Introduction

Over the past few years, several US government agencies have implemented programs designed to increase the use of electronic financial transactions in developing countries in order to reduce crime. In this paper, we estimate the impact of electronic financial transactions on economic crimes in a sample of 71 countries. Using data on point of sale devices and crime rates from 2004 to 2009, we find that an increase in point of sale devices of 1 per 1000 people leads to reduction in robbery of 2.2–5.6%.[3] Our findings suggest that, while no panacea for the physical insecurity that plagues poor or war-torn countries, proliferation of electronic financial transactions does indeed enhance public safety and that American efforts to promote electronic financial transactions overseas are well justified.[4]

The first American attempt to promote electronic financial transactions as a means of enhancing security was a 2008 U.S. Department of Defense initiative to expand the use of electronic payments in Iraq and Afghanistan. The initiative, known as the "Cashless Battlefield," involved shifting compensation of local suppliers and contractors from cash payments to "mobile banking" – a form of electronic financial transactions that exploits the cellular telephone network. One reason for this was to eliminate the logistic burden created by so-called "jingle runs" – vulnerable large-scale shipments of cash that had to be escorted through hostile territory. More important, however, was the belief that development of electronic financial transactions in Iraq and Afghanistan would

* Corresponding author. Tel.: +1 831 656 2818, mobile: +1 415 813 9212.

E-mail addresses: larmey@nps.edu (L.E. Armey), jlipow@nps.edu (J. Lipow), njwebb@nps.edu (N.J. Webb).

[1] Tel.: +1 831 656 2661.

[2] Tel.: +1 831 656 2013.

[3] In tangentially related research, Rogoff (1998) and Drehmann et al. (2002) evaluate the impact of violent crime on demand for physical cash for small samples of OECD nations. Neither paper finds any clear or meaningful relationship between the two.

[4] Focusing on electronic financial transactions and crime in the United States, Wright et al. (2014), consistent with our findings, reports that electronic financial transaction adoption does appear to reduce crime.

http://dx.doi.org/10.1016/j.infoecopol.2014.10.002
0167-6245/Published by Elsevier B.V.

complicate insurgent efforts to engage in robbery and extortion, thereby enhancing physical security.[5]

The Cashless Battlefield has been followed by the "Better than Cash Alliance," an initiative of the U.S. Agency for International Development that was launched in September 2012. The Better than Cash Alliance's formal goal is to "empower people by accelerating the shift to electronic payments." One of the initiative's formal objectives is to enhance the physical security of often defenseless people who do not enjoy adequate legal or police protection and are routinely robbed of the cash they carry in their wallets or store in their homes and businesses.[6]

In his remarks at the inauguration of the Better than Cash Alliance, US Agency for International Development administrator Rajiv Shah outlined a variety of initiatives that the Agency has mounted to promote electronic financial transactions – initiatives that clearly illustrate the ambitious nature of the Better than Cash Alliance:

> In the Philippines, we're working with a range of public and private partners to transition 100 companies to e-payroll. And I've personally offered President Aquino our support for their new commitment to electronic payments in government.
>
> In Malawi, we are supporting the efforts of the government to shift 300,000 civil servant salaries from cash to mobile money—as well as transition over the nation's largest agricultural voucher program from paper to mobile delivery.
>
> And in Afghanistan, we are delighted by the very recent news that they have made their own commitment to Better than Cash. We will continue to work closely with them to ensure more than 300,000 Afghans can pay their electricity bills from their phones—ultimately helping to drive more revenue to the utility company and expand electricity to 80 percent of Afghans that don't have access today.
>
> Underpinning these efforts, we have also recently forged two new partnerships with Citi and Vodafone and Technoserve to reach a scale in mobile money previously unimaginable. This partnership will build on our work across the world, but especially in Haiti—where we helped launch a mobile money revolution, expanding access to more than 800,000 people.[7]

Efforts like the Better than Cash Alliance and the Cashless Battlefield illustrate that US government agencies are deeply convinced of the efficacy of electronic payment technologies as a means to enhance physical security in poor and dangerous places. Surprisingly, however, very little is actually known about electronic financial transactions' impact on crime.

Until recently, much of the extensive dialogue on electronic financial transactions and crime has taken the form of estimates or anecdotes. Warwick (1993), for example, forecasts that if the United States fully replaced the use of cash with electronic financial transactions "it is plausible that at least 15% and as much as 40% of crime in general could be prevented." Meanwhile, an evaluation of the M-PESA mobile banking network in Kenya offers the following as evidence of the efficacy of electronic financial transactions in reducing crime:

> One of our customers traveling from Nairobi to Kisumu deposited money with M-PESA and withdrew it at his destination instead of carrying cash – this is to combat the insecurity and theft on public transport. This behavior was also seen during the M-PESA pilot.[8]

To be sure, there is absolutely nothing wrong with estimates and anecdotes, but it is probably not good practice for major government agencies to divert considerable financial and managerial resources into initiatives inspired by the behavior of "some guy who took a bus." Clearly, a more careful analysis of the relationship between electronic financial transactions and crime is required.

Our paper proceeds as follows: Section 2 reviews the relevant literature on the effect of electronic transactions on crime. Sections 3 and 4 describe our estimation strategy and data. In Section 5, we report our findings. Our results suggest that there is a negative and significant statistical relationship between electronic financial transactions and economic crimes such as robbery and burglary. In Section 6, we consider the possibility that our findings are the result of a spurious relationship and that some unidentified variable is driving both increased point of sale device penetration while reducing crime. To test for this, we evaluate the statistical relationship between electronic financial transactions and non-economic crimes such as homicide and rape. We find, reassuringly, that point of sale device proliferation has no impact on non-economic crime. Section 7 concludes the paper with a discussion of its implications for future research and development policy.

2. Cash and crime

In his seminal 1968 paper, "Crime and Punishment: An Economic Approach," Gary Becker developed a model where rational agents choose to engage in crime if the expected return exceeds that legal economic activities can offer. While such an approach to crime is obviously unsuitable for understanding the motivations of serial killers or sexual predators, there is no doubt that a good portion of crime, particularly property crime such as robbery and burglary, is indeed motivated by straightforward economic considerations of risk and reward.

Following Becker (1968), a very sizable literature developed that explored various aspects of the relationship between economics and crime. One line of research sought to identify the social and economic factors that made crime economically attractive, and focused on the roles that poverty, social equity, education, and demographics play in determining the level of crime.[9]

[5] See Kunkel (2008) for a description of the Cashless Battlefield Initiative.

[6] See http://betterthancash.org/why-e-payments/ accessed 4 January 2013.

[7] See http://www.usaid.gov/news-information/speeches/remarks-administrator-rajiv-shah-ford-foundation, accessed 4 January 2013.

[8] See Vaughan (2007), p. 6.

[9] For a good review of this literature, see Buananno (2003).