



Munich Personal RePEc Archive

Early “Frictions” in the Transition towards Cashless Payments

Batiz-Lazo, Bernardo and Buckley, Tom

Northumbria University, University of Sheffield

July 2021

Online at <https://mpra.ub.uni-muenchen.de/108834/>
MPRA Paper No. 108834, posted 22 Jul 2021 06:54 UTC

Early “Frictions” in the Transition towards Cashless Payments

By Bernardo Bátiz-Lazo (Northumbria) and Tom R. Buckley (Sheffield)

Email – bernardo.batiz-lazo@northumbria.ac.uk and t.buckley@sheffield.ac.uk

Abstract – In this article we describe the trials and tribulations in the early stages to introduce cashless retail payments in the USA. We compare efforts by financial service firms and retailers. We then document the ephemeral life of one of these innovations, colloquially known as “Hinky Dinky”. We conclude with a brief reflection on the lessons these historical developments offer to the future of digital payments.

Let’s go back to the last quarter of the 20th century. This was a time when high economic growth in the USA that followed the end of World War II was coming to an end, replaced by economic crisis and high inflation. It was a time where cash was king, and close to 23% of Americans worked in manufacturing. A time when the suburbs – to which Americans had increasingly flocked after 1945 escaping city centres – were starting to change. Opportunities for greater mobility were offered by automobiles, commercial airlines, buses, and the extant railway infrastructure.

This was the period that witnessed the dawn of the digital era in the United States, as information and communication technologies began to emerge and grow. The potential of digitalisation provided the context in which an evocative idea, the idea of a cashless society first began to emerge. This idea was associated primarily with the elimination of paper forms of payment (primarily personal checks) and the adoption of computer technology in banking during the mid-1950s (Bátiz-Lazo *et al.*, 2014). Here it is worth noting that, although there is some disagreement as to the exact figure, the volume of paper checks cleared within the U.S. had at least doubled between 1939 and 1955, and the expectation was, that this would continue to rise. This spectacular rise in check volume, with no corresponding increase in the value of deposits, placed a severe strain on the U.S. banking system and led to a number of industry-specific innovations emerging from the 1950s such as the so-called ERMA and electronic ink characters (Bátiz-Lazo and Wood, 2002).

The concept of the cashless, checkless society became popularised in the press on both sides of the Atlantic in the late 1960s and early 1970s. Very soon the idea grew to include paper money. At the core of this imagined state was the digitalization of payments at the point of sale, a payment method that involved both

competition and co-operation between retailers and banks (Maixé-Altés, 2020 and 2021).

In the banking and financial industry new, transformative technologies thus began to be trialled and developed in order to make this a reality (Maixé-Altés, 2019). Financial institutions accepting retail deposits had been at the forefront of the adoption of commercial applications of computer technology (Bátiz-Lazo *et al.*, 2011). Early forms of such technical devices mainly focused on improving “back office” operations and encompassed punch card electromechanical tabulators in the 1920s and 1930s; later, in the 1950s, analogue devices (such as the NCR Post Tronic of 1962) were introduced, and, in the late 1960s the IBM 360 became widely adopted. But at the same time, regulation curtailed diversification of products and geography (limiting the service banks could provide their customers). These regulatory restrictions help to explain ongoing experiments with a number of devices which involved a significant degree of consumer interaction including credit cards (Stearns, 2011), the use of pneumatic tubes and CCTV in drive through lanes, home banking, and Automated Teller Machines (ATMs), which despite being first introduced in the late 1960s and early 1970s, would ultimately not gain acceptance until the early 1980s (Bátiz-Lazo, 2018).

Like the banking and financial industry, the retail industry, with its very real interest in point of sale digitalization, was exposed to the rise of digital technology in the last quarter of the 20th Century. The digitalisation of retailing occurred later than in other industries in the American economy (for a European account see Maixé-Altés and Castro Balguer, 2015). Once it arrived, however, the adoption of a range of digital technologies including Point of Sale (POS) related innovations such as optical scanning, and the universal product code (UPC), were extensive and transformed the industry (Cortada, 2003). From the perspective of historical investigation, the chronological place of such innovation, beginning in the mid-1970s, is associated with a remarkable period of rapid technological change in U.S. retailing (Basker, 2012; Bucklin 1980). Along with rapid technological change, shifts in the structure of retail markets, in particular the decline of single “mom and pop stores” and the ascent of retail chains also became more pronounced in the 1970s (Jarmin, Klimek and Miranda, 2009). Two decades later, such large, retail firms would account for more than 50% of the total investment in all information technology by U.S. retailers (Doms, Jarmin and Klimek, 2004).

What connects the transformative technological changes that occurred in both the banking industry and the retail industry during this period, is that both sought to utilise Electronic Funds Transfer Systems, or EFTS, a way to reduce frictions for retail payments at the point of sale. During the 1970s and 1980s, the term EFTS was used in a number of ways. Somewhat confusingly, it was applied indistinctively to specific devices or ensembles, value exchange networks, and what today we denominate as infrastructures and platforms. While referring to it as a systems technology for payments it was defined as one:

“in which the processing and communications necessary to effect economic exchange and the processing and communications necessary for the production and distribution of services incidental to economic exchange are dependent wholly or in large part on the use of electronics” (National Commission on Electronic Funds Transfer, 1977, 1).

Ultimately EFTS would come to be extended to the point of sale and embodied in terminals which allowed for automatic, digital, seamless transfer of money from the buyer’s current account to the retailer’s, known as the Electronic Funds Transfer at the Point of Sale, or EFTS-POS (Dictionary of Business and Management: 2016).

One of the factors that initially held back the adoption of early EFTS and the equipment that utilities it, was the lack of infrastructure that would connect the user, the retailer, and the bank (or wherever the user’s funds were stored). As Bátiz-Lazo *et al.* (2014) note the idea of a cashless economy that would provide this infrastructure was highly appealing... but implementing its actual configuration was highly problematic. Indeed, in contrast to developments in Europe, some lawmakers in Congress considered the idea of sharing infrastructure by banks as a competitive anathema (Sprague, 1977). Large retailers such as Sears had a national presence and were able to consider implementing their own solution to the infrastructure problem. Small banks looked at proposals by the likes of Citibank with scepticism while they feared it may pivot the dominance of large banks. George W. Mitchell (1904-1997), a member of the Board of the Federal Reserve, and management consultant John Diebold (1926-2005), were outspoken promoters of the adoption of cashless solutions but their lobbying of public and private spheres was not always successful. Perhaps the biggest chasm between banks and retailers though, resulted from the capital-intensive nature of the potential network and infrastructure that any form of EFTS required.

Amongst the alternative solutions that were trialled by banks and retailers, there were a number of successes, such as ATMs (Bátiz-Lazo, 2018) and credit cards (Ritzer, 2001; Stearns, 2011). Both bankers and retailers were quick to see a potential connection between the machine-readable cards and the rapid spread of new bank-issued credit cards under the new Interbank Association (i.e., the genesis of Mastercard) and the Bankamericard licensing system (i.e., the genesis of Visa), both of which began in 1966, just as the vision of the cashless society was winning acceptance. Surveys from the time indicate that at least 70 percent of bankers believed that credit cards were the first step toward the cashless society and that they were entering that business in order to be prepared for what they saw as an inevitable future (Bátiz-Lazo *et al.*, 2014).

There were also a number of less successful attempts that, far from being relegated to the ignominy of the business archives, offer an important insight into the implementation of a cashless economy which is worth preserving for future generations of managers and scholars. Chief amongst these is a system widely deployed by the alliance of U.S. savings and loans (S&L) with mid-sized retailers under the sobriquet “Hinky Dinky”. Interestingly, Maixé-Altés (2012, 213-214) offers an account of a similar, independent, and contemporary experiment in, a very different context, Spain. The Hinky Dinky moniker was derived from an experiment by the Nebraskan First Federal Savings and Loan Association, which in 1974 located computer terminals into stores of the Hinky Dinky grocery chain - which at its apex operated some 50 stores across Iowa and Nebraska. The Hinky Dinky chain was seen by the First Federal Savings and Loan Association as the perfect retail partner for this experiment owing to the supermarket’s popularity with local customers; an appeal that would be beneficial to this new technology. The popularity of Hinky Dinky was particularly valuable, as the move by First Federal Savings and Loans, to establish an offsite transfer system challenged, but did not break banking law at that time (Ritzer, 1984).

At the heart of the technical EFT system initiated by First Federal, formally known as Transmatic Money Service, was a rudimentary, easy-to-install package featuring a point-of-service machine, with limited accessory equipment in the form of a keypad and magnetic character reader. The terminal housed in a dedicated booth within the store and was operated by store employees (making a further point of the separation between bank and retailer). The terminal enabled the verification and

recording of transactions as well as the instant updating of accounts. The deployment of the terminals in Hinky Dinky stores shocked the financial industry because it made the Nebraska S&L appear to be engaging in banking activities, while the terminals themselves provided banking services to customers in a location that was not a licensed bank branch!

From its origins in a mid-sized retail chain in the Midwest, some 160 “Hinky Dinky” networks appeared across the USA between 1974 and 1982, before S&Ls abandoned them in favour of ATMs and credit cards. These deployments included a roll out in 1980 by the largest savings banks by assets in the USA at the time, the Philadelphia Savings Fund Society or the PSFS. Rather than commit to the large capital investment that ATMs necessitated, without guarantees of its viability or a secure return on investment, the PSFS pivoted the “Hinky Dinky” terminals as part of the rolled out of its negotiable order of withdrawal (NOW) accounts (commercialised as “Act One”).

The NOW accounts were launched in the early 1970s by the Consumer Savings Bank, based in Worcester, MA (today part of USBank), as way to circumvent the ban on interest payment and current account deposits imposed on S&Ls by Depression era regulation. Between 1974 and 1980, Congress took incremental steps to allow NOW accounts nationwide, something the PSFS wanted to take advantage of. Consequently, in February 1979, the PSFS signed an agreement with the Great Atlantic and Pacific Tea Company (A&P) to install Transmatic Money Service devices in 12 supermarket locations. This was part of the PSFS wider strategy “to provide alternative means for delivering banking services to the public” (Hagley Archives: PSFS Collection).

These terminals did not, however, allow for the direct transfer of funds from the customer’s accounts to the retailers. Rather the terminals, which were operated by A&P employees, were activated by a PSFS plastic card that the society issued to customers, and enabled PSFS customers with a Payment and Savings account to make withdrawals and deposits. The terminals also allowed PSFS cardholders and A&P customers to cash cheques.

The equipment used by PSFS, the Hinky Dinky devices, therefore represent an interesting middle ground which improved transaction convenience for consumers, was low risk for the retailer and was relatively less costly for banks and financial institutions than ATMs (Benaroch & Kauffman, 2000).

One of the most interesting features of the Hinky Dinky terminals as they were deployed by the PSFS and First Federal Savings, was that they represent co-operative initiatives between retail organisations and financial institutions. As mentioned before, this was not necessarily the norm at the time. As the legal counsel to the National Retail Merchants Association (a voluntary non-profit trade association representing department, speciality and variety chain stores) wrote in 1972: “Major retailers... have not been EFTS laggards. However, their efforts have not necessarily or even particularly been channelled toward co-operative ventures with banks,” (Schuman, 1976, 828). These sentiments were echoed by more neutral commentators who similarly highlighted the lack of dialogue between retailers and financial institutions on the topic of EFTS (Sprague, 1974). The extent to which retailers provided financial services to their customers had long been a competitive issue in the retail industry: the ability of chain stores, such as A&P in groceries and F.W. Woolworth in general merchandise, to offer low prices and better value owed much to their elimination of credit and deliveries (Lebhar, 1952). With the advent of EFT retail organisation’s provision of financial services raised the prospect of this becoming a competitive issue between these two industries.

The prospect of a clash between retailers and banks was increased moreover, as there had always been other voices, other retailers, who had been willing to offer credit (Calder, 1999). In the early years of the 20th century, consumer demand for retailers to provide credit grew. This caused tension with the cash only policies of department store such as A.T. Stewart and Macy’s, and the mail order firms Sears Roebuck and Montgomery Ward (Howard, 2015). Nevertheless, it was hard to ignore such demand as evidenced by Sears decision to begin selling goods on instalment around 1911 (Emmet and Jeuck, 1950, 265). Twenty years later, in 1931, the company went a stage further by offering insurance products to consumers through the All State Insurance Company. Other large retail institutions, however, resisted the pressure to offer credit until much later (J.C. Penney for instance would not introduce credit until 1958). Credit activities by large retailers, nonetheless, were determinant for banks to explore their own credit cards as early as the 1940s while leading to the successes of Bankamericard and the Interbank Association in the 1960s (Bátiz-Lazo and del Angel, 2018; Wolters, 2000).

The barriers between banks and financial institutions on the one hand, and retailers on the other, continued to remain fairly robust. Signs that this was beginning

to change began to emerge in the 1980s, when retailers, such as Sears began to offer more complex financial products (Christiansen, 1987; Ghemawat, 1984; Raff and Temin, 1997). Yet, the more concerted activity by retailers to diversify into financial services, would ultimately be stimulated by food retailers (Martinelli and Sparks, 1999; Colgate and Alexander, 2002). The Hinky Dinky System however shows that a co-operative not just a competitive solution was a very real possibility.

In 2021 we are witnessing an extreme extension and intensification of these trends. Throughout the ongoing Covid-19 pandemic, the use of cash has greatly declined as more and more people switch to digital payments. In the retail industry, even before the pandemic, POS innovations were becoming increasingly digital (Reinartz and Imschloß, 2017) as retailers shifted toward a concierge model of helping customers rather than simply focusing on processing transactions and delivering products (Brynjolfsson *et al.*, 2013). Consequently, the retail-customer interface was already starting to shift away from one that prioritised the minimisation of transaction and information costs toward an interface which prioritised customer engagement and experience (Reinartz *et al.*, 2019).

A second feature of the pandemic has been the massive increase in interest in crypto currencies, in its many different forms, around the world. This is most apparent in the volatility and fluctuations in price of Bitcoin, but is also evident in the increased prominence of alternative fiat currencies (such as Ether). Indeed, even central banks in Europe and North America are discussing digital currencies, the government of El Salvador has made Bitcoin legal tender, while the People's Bank of China have launched their own digital currency in China. A further manifestation of the momentum crypto currencies are gaining include the private initiatives of big tech (such as Facebook's Diem, formerly Libra). Yet, in spite of all of this latent promise, transactions at point of sale with crypto currencies are still minuscule and time and again, surveys by central banks on payment preferences consistently report people want paper money to continue to play its historic role.

It thus remains too early to forecast with any degree of certainty what the actual long-run effects of the virus, social distancing and lockdowns will have on the use of cash, how consumers acquire products and services, and what these products and services are. It is also uncertain whether and if greater use of crypto currencies will lead to a decentralised management of monetary policy (and if so, the rate at which this will take place). It is though almost certain that consumer's

behaviours, expectations and habits will have been altered by their personal experiences of Covid. In this context the story behind “Hinky Dinky” reminds us to be sober at a time of environmental turbulence and wary of extrapolating trends, to better understand the motivation driving the adoption of new payment technology as some of these trends, like “Hinky Dinky”, might look to have wide acceptance but to result in a short-term phenomenon.

Acknowledgements

We appreciate helpful comments from Jeffrey Yorst, Amanda Wick and J. Carles Maixé-Altés. As per usual, all shortcomings remain responsibilities of the authors.

References

- Basker, E. (2012). Raising the Barcode Scanner: Technology and Productivity in the Retail Sector. *American Economic Journal: Applied Economics*, 4(3), 1-27.
- Bátiz-Lazo, B. (2018). *Cash and Dash: How ATMs and Computers Changed Banking*. Oxford: Oxford University Press.
- Bátiz-Lazo, B., Maixé-Altés, J. C., & Thomes, P. (2011). *Technological Innovation in Retail Finance: International Historical Perspectives*. London and New York: Routledge.
- Bátiz-Lazo, B., Haigh, T., & Stearns, D. L. (2014). How the Future Shaped the Past: The Case of the Cashless Society. *Enterprise & Society*, 15(1), 103-131.
- Bátiz-Lazo, B., & del Ángel, G. (2018). The Ascent of Plastic Money: International Adoption of the Bank Credit Card, 1950-1975. *Business History Review*, 92(3 (Autumn)), 509 - 533.
- Bátiz-Lazo, B., & Wood, D. (2002). An Historical Appraisal of Information Technology in Commercial Banking. *Electronic Markets - The International Journal of Electronic Commerce & Business Media*, 12(3), 192-205.
- Benaroch, M., & Kauffman, R. J. (2000). Justifying Electronic Banking Network Expansion Using Real Options Analysis. *MIS quarterly*, 197-225
- Bucklin, L. P. (1980). Technological-change and Store Operations-The Supermarket Case. *Journal of retailing*, 56(1), 3-15.
- Calder, L. (1999). *Financing the American Dream: A Cultural History of Consumer Credit*. Princeton: Princeton University Press.
- Colgate, M., & Alexander, N. (2002). Benefits and Barriers of Product Augmentation: Retailers and Financial Services. *Journal of Marketing Management*, 18(1-2), 105-123.
- Cortada, J. (2004). *The Digital Hand, Vol 1: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries*. Oxford: Oxford University Press.
- Christiansen, E. T. (1987) *Sears, Roebuck & Company and the Retail Financial Services Industry (Part Two)*. Case 9-387-182. Cambridge, MA: Harvard Business School.
- Doms, M. E., Jarmin, R. S., & Klimek, S. D. (2004). Information technology Investment and Firm Performance in US Retail Trade. *Economics of Innovation and new Technology*, 13(7), 595-613.
- Emmet, B., Jeuck, J. E., & Rosenwald, E. G. (1950). *Catalogues and Counters: A History of Sears, Roebuck and Company*. Chicago: University of Chicago Press.

Ghemawat, P. (1984) *Retail Financial Services Industry, 1984*. Case 9-384-246, Cambridge, MA: Harvard Business School.

Hagley Museum and Archives Philadelphia Savings Fund Society Collection 2062 Box 13 POS Program Introduction March 2, 1978.

Howard, V. (2015). *From Main Street to Mall: The Rise and Fall of the American Department Store*. Philadelphia: University of Pennsylvania Press.

Jarmin, R. S., Klimek, S. D., & Miranda, J. (2009). The Role of Retail Chains: National, Regional and Industry results. In *Producer dynamics: New evidence from micro data* (pp. 237-262). Chicago: University of Chicago Press.

Lebhar, G. M. (1952). *Chain stores in America, 1859-1950*. New York: Chain Store Publishing Corporation.

Martinelli, E. and Sparks, L. (2003). Food Retailers and Financial Services in the UK: A Co-opetitive Perspective", *British Food Journal*, Vol. 105 No. 9, pp. 577-590.

Maixé-Altés, J. C. (2012). *Innovación y compromiso social. 60 años de informatización y crecimiento*. Barcelona: "la Caixa" Group.

Maixé-Altés, J. C. (2019): "The Digitalisation of Banking: A New Perspective from the European Savings Banks Industry before the Internet," *Enterprise and Society*, Vol. 20, No. 1, pp. 159-198.

Maixé-Altés, J. C. (2020): "Retail Trade and Payment Innovations in the Digital Era: A Cross-Industry and Multi-Country Approach", *Business History* Vol. 62, No. 9, pp. 588-612.

Maixé-Altés, J. C. (2021): "Reliability and Security at the Dawn of Electronic Bank Transfers in the 1970s-1980s". *Revista de Historia Industrial*, Vol. 81, pp. 149-185.

Maixé-Altés, J. C. and Castro Balguer, R. (2015): "Structural Change in Peripheral European Markets. Spanish Grocery Retailing, 1950-2007", *Journal of Macromarketing*, Vol. 35, No. 4, pp. 448-465.

Raff, D., & Temin, P. (1999). Sears, Roebuck in the Twentieth Century: Competition, Complementarities, and the Problem of Wasting Assets. In *Learning by doing in markets, firms, and countries* (pp. 219-252). Chicago: University of Chicago Press.

Reinartz, W., & Imschloß, M. (2017). From Point of Sale to Point of Need: How Digital Technology is Transforming Retailing. *NIM Marketing Intelligence Review*, 9(1), 42.

Reinartz, W., Wiegand, N., & Imschloß, M. (2019). The Impact of Digital Transformation on the Retailing Value Chain. *International Journal of Research in Marketing*, 36(3), 350-366.

Ritzer, G. (2001). *Explorations in the Sociology of Consumption: Fast Food, Credit Cards and Casinos*. Thousand Oaks, CA: Sage Publishing.

- Ritzer, J. (1984) Hinky Dinky Helped Spearhead POS, remote banking movement. *Bank Systems and Equipment* December 51-54.
- Schuman, C. R. (1975). The Retail Merchants' Perspective Towards EFTS. *Catholic University Law Review*, 25(4), 823-842.
- Sprague, R. E. (1977). Electronic Funds Transfer In Europe: Their Relevance for the United States. *Savings Banks International*, 3, 29-35.
- Sprague, R.E. (1974) Electronic Funds Transfer System. The Status in Mid-1974 – Part 2. *Computers and People* 23(4).
- Stearns, D. L. (2011). *Electronic Value Exchange: Origins of the Visa Electronic Payment System*. London: Springer-Verlag.
- United States. National Commission on Electronic Funds Transfer. (1977). *EFT and the public interest: a report of the National Commission on Electronic Fund Transfers*. Second printing. Washington: National Commission on Electronic Fund Transfers.
- Wolters, T. (2000). 'Carry Your Credit in Your Pocket': The Early History of the Credit Card at Bank of America and Chase Manhattan. *Enterprise & Society*, 1(2), 315-354.