Your Guide to Conquering
Cash-Management Costs

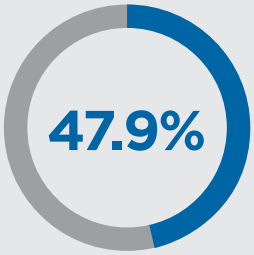
Diebold Nixdorf

A Comprehensive Resource for Understanding Cash Recycling

DieboldNixdorf.com

Keeping ATM networks supplied with the cash customers need is no easy task with enterprisewide implications ranging from logistics to risk, from manpower to cost of cash. And, in a world where every penny counts, financial institutions need solutions.

Automated cash recycling is one way to reduce cash-handling challenges, and it can bring significant benefits to financial institutions. Specific levels of return on investment in this technology vary based on factors such as transaction volume, note deposit to withdrawal ratios, cassette configuration, and note fitness and counterfeit rate, but many have found cash recycling a compelling solution for decreasing cash-management costs.



Cash management for nonrecycling ATMs accounts for an average of 47.9 percent of ATM network operating costs.

CONSIDER:

On average, cash management for nonrecycling ATMs accounts for an average of 47.9 percent of ATM network operating costs globally—an estimated 1.3 billion–2.6 billion euros per year for Europe alone.[1,2]

Cash-management costs could go up—the total volume of banknotes in circulation has increased at a compound annual growth rate (CAGR) of 4.92 percent in the U.S.[3] and 6.22 percent in Europe[4] over the last five years (from the end of 2011 through 2016).

[1] "Annual ATM Services Expenditures." Datamonitor. 2015.
[2] "Best Practices in ATM Cash Replenishment in Europe." European Payments Council, ATM Industry Association. 2014.
[3] "Currency in Circulation: Volume." Federal Reserve Bank. 2017.
[4] "Banknotes and Coins Circulation." European Central Bank. 2017.

How does Automated Cash Recycling Add Up to Serious Savings?

BY AUTOMATICALLY RECIRCULATING DEPOSITED CASH.

While some financial institutions spend significant resources loading and unloading cash from ATMs themselves, cash-in-transit (CIT) service providers are increasingly called upon, and they can't always keep up. In China, where transaction volume is high, governmentowned CIT providers are occasionally overwhelmed, delaying service. An estimated two hours of cash handling is required per CIT visit, and a significant percentage of Chinese nonrecycling ATM costs are subsequently tied to cash handling.[5]

BY MAKING CASH HANDLING SIMPLER.

Implementing process-automating units that can securely and accurately accept, store and recirculate cash can mean fewer resources devoted to ATM cash supply and fewer headaches.

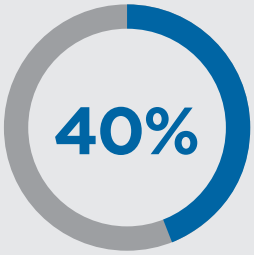
BY REDUCING RISK.

Cash recycling means better security—when deposited cash can be automatically recirculated within an ATM or stand-alone cash-recycling unit, cash never leaves a secure environment. Diebold Nixdorf's cash-recycling modules also automatically check deposited cash for signs of counterfeiting, further alleviating risk, and these units comply with all current Central Bank Authorities.*

*Please check with your Diebold Nixdorf representative for details.

BY STRIKING THE RIGHT BALANCE.

Automated recycling can not only reduce costs related to labor and security, but to lost interest potential, interbank loan payments and cash insurance by allowing financial institutions to fill terminals with only as much cash as necessary. In some countries, there is serious risk of ATMs running out of cash between refills. In others, financial institutions maintain as much as 40 percent too much cash.[6] By working with cashmanagement experts to determine average cash withdrawal and deposit rates across an ATM network, financial institutions can optimize load volumes and minimize expenses.



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2 HOUR

Two hours of cash handling per CIT visit in China.

[5] "Cash Recycler China Analysis." Diebold. 2009.
[6] "The Costly to and Fro of Cash." BAI. 2006.

Cash Recycling Signifies Untapped Potential for Branches Globally

Without cash recycling, financial institutions are missing significant opportunities to reduce costs related to cash handling, transportation, security and other management requirements. While financial institutions are moving toward replacing cash dispensers with automated deposit terminals, half of these advanced terminals do not currently recycle banknotes.[7]

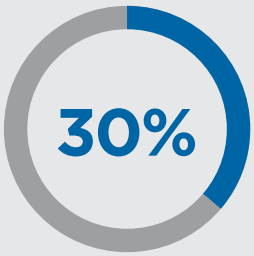
THIS REALITY, HOWEVER, IS CHANGING.

Cash-recycler installations in Europe rose by 30 percent between 2014 and 2015 as banks began capitalizing on potential savings.[7]

Of the 1.2 million automated deposit terminals installed in 2015, 51 percent were recycling ATMs. When a predicted 1.7 million automated deposit terminals are installed in 2021, 67 percent of them are expected to be cash recycling-enabled.[7]

Japan, well known as an efficient country, began embracing cash recycling in 1983 and has now done so to the point that nearly all domestic financial institutions have adopted the technology.

As the business case for cash-recycling ATMs continues to improve and be recognized, the share of recycling units is forecast to grow for the forseeable future.[8]



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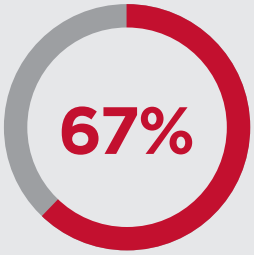


By 2021, 67 percent of new automated deposit-enabled terminals will be recyclers.

[7] "Deposit Automation and Recycling 2016." RBR. 2016
[8] "Banking Automation Bulletin Issue 355." RBR. 2016.

Why it is More Important than ever to Make the Switch

BECAUSE CASH REMAINS KING.

Globally, 85 percent of consumer transactions are conducted with cash, which both financial institutions and retail operations must effectively and securely handle.[9]

- While some suggest that digital payments could undermine the role of cash, cash is still the most-used form of payment in the U.S., used in 32 percent of transactions. Electronic payments still only make up [11] percent of U.S. payments.[10]
  - U.S. consumers make more cash deposits by volume at ATMs than at branches—$2.7 trillion in ATM deposits vs. $587 billion in withdrawals — and those deposits could be immediately recirculated with cash recycling.[11]
- Globally, the case for cash recycling is even more compelling.
  - 99 billion cash withdrawals were made worldwide in 2015, with the number of withdrawals increasing year-over-year in all regions.
  - The Asia Pacific region showed a withdrawal percentage increase of 16 percent from 2014 and 2015, and the Middle East and Africa region showed an 8 percent increase.[12]

The demand for cash is on the rise across the globe, and banks are seeking ways to efficiently service that demand. As a result, cash-recycling ATM installations are projected to grow at a CAGR of 10.7 percent through 2021.[13]

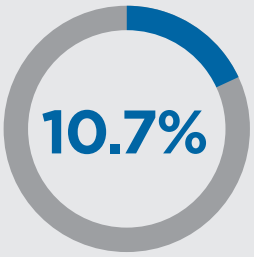
TO BOOST CUSTOMER SATISFACTION.

Technology and mobility have empowered banking customers—especially millennials—to easily switch financial institutions, and an inability to access cash when needed could be the deal-breaker.

- With automated cash recycling, financial institutions can reduce ATM downtime and maintain higher cash availability rates, boosting overall satisfaction.

BECAUSE NOW, THEY CAN.

Central banks in countries like China and Indonesia had implemented regulations that temporarily limited adoption of cash-recycling functionality as a side effect. These regulations are being lifted, however, creating the potential for far greater cash recycling integration in a part of the world where 84 percent of cash recyclers were sold in 2015.[13]



Cash-recycler adoption is expected to grow at a 10.7 percent CAGR worldwide through 2021.

85 percent of global consumer transactions are conducted with cash.

[9] "Measuring Progress Toward a Cashless Society." Mastercard. 2014.
[10] "2015 Diary of Consumer Payment Choice." Federal Reserve Bank. 2016.
[11] "2013 Federal Reserve Payments Study." Federal Reserve Bank. 2013.
[12] "Global ATM Market and Forecasts to 2021." RBR. 2017.
[13] "Deposit Automation and Recycling 2016." RBR. 2016.

Why Diebold Nixdorf Recycling Technology?

Diebold Nixdorf's cash-recycling solutions keep terminals full of usable cash for longer periods of time, resulting in fewer unserved customers. You also gain the peace of mind that comes with Diebold Nixdorf's well-established history of providing secure, reliable products. Whatever your cash-management needs, our cash-recycling modules deliver the functionality and flexibility to keep costs down.

Careful
counting, sorting, denominating, fitness-checking and validating cash automatically throughout processing, and motorized sensors ensure all notes are removed during emptying

Flexible
allowing storage of up to seven denominations/currencies, the ability to choose your cassette configuration and dispensing of specified denominations to maximize time between cash replenishments

Fast
dispensing hundreds of notes per transaction at rates of up to 10 notes per second to allow consumers to quickly complete their banking

Thorough
relying on robust friction-pick technology to ensure accurate note separation and banknote transportation by light sensors that provide data for deep performance and issues analysis

Secure
with locked and sealed cassettes, access controls, onboard countermeasures against a variety of attacks and a fully contained cash-handling process

Reliable
with proven dependability, superior performance and simple serviceability for high levels of uptime

High Capacity
with the ability to hold substantial quantities of cash in cassette configurations that allow longer periods of autonomous operation

The Road to Lower Cash-Management Costs Starts Here

RM3 CASH-RECYCLING MODULE

The RM3* ensures the highest levels of reliability and availability through high-end cash-recycling performance. It uses a distinct platform cassette concept with unique cash intelligence and electronic security features, in addition to further optimizing total cost of ownership with plug-and-play cassette technology—including CCMS—interchangeable with select systems within the CS portfolio.

Technical Data

- Dispenser Speed (Notes per second): Up to 10
- Dispenser Bundle Size (Notes per second): Up to 300

Cassettes

- Stacking Space(mm): 300 (large) / 200 (small)
- Cassette Capacity(New Notes): 2,400 (large)/1,500 (small)
- Maximum Capacity: 315,600
- MM per Note: 0.125 – 0.133
- @ 0.125 Per Note: 2,609 (large)/1,739 (small)
- Maximum Capacity: 17,392

Filling-level sensor provides detailed information for efficient cash-handling processes

Intelligent cassette concept includes electronic sensors to monitor the shutter, the lid and the dispensing module for secure note handling in the system and during transport

Easily adjusted cassette for quicker serviceability and conversion to other denominations without tools

Scalable cassette technology (from basic to high-end) includes the option of ink staining

"Smart" banknote storage concept with cash-management memory for highly efficient cash processes

"Platform Concept" cassette can be used in ATM / CRS / ATS / POS systems (i.e., CCMS)

Configurations

- Cassettes Supported: Flexible use of up to 8 cassettes, supporting up to 7 different denominations
- Cassette Support Options(Pick Channels): Up to 8
- Cassettes Orientation: Horizontal
- Maximum Cassettes: 8
- Maximum Denominations: 7

Note Handling

Dual mechanical note recognition function for banknote height and thickness ensures correct number of notes and sorting out problem notes

Unique separation mechanism, identical for I/O tray and cassette, ensures trouble-free note transportation in both directions

Single reject function optimizes handling of problematic banknotes and reduces notes in reject bin

Foreign body detection at multiple steps to separate notes in deposit transactions, and robust, short reject paths if none of these measures finished

Security

Anti-cash-trapping solution via software possible (OSG)

Encrypted communications for additional security

Intelligent CrypTA access concept for service staff and operators ensures controlled access to the device and its different functions

*RM3 Cash Recycling technology is available with the following CS Systems:
CS 4040, CS 4060, CS 4080, CS 4560, CS 4580, CS 4090

Case Study

BELGIUM

Cash recycling has significant potential: One Diebold Nixdorf customer in Belgium transformed its network completely by utilizing Diebold Nixdorf's ActivRecycle™ technology to achieve an estimated 50 percent overall cash-management savings. The bank transitioned to an open-branch concept—a model where the traditional teller counter is removed and customers are engaged throughout the branch—which was made possible by cash-recycling adoption. This technology was deployed across the bank's network to drive all cash transactions to the ATM channel, allowing busy consumers to conveniently access and deposit cash. Cash recycling was integrated with back-end transactions and accounting procedures, removing the need for manual, time-consuming cash counting that can lead to mistakes. Ultimately, ActivRecycle was the critical component that allowed the bank to reach its branch transformation and cost-reduction goals through automation.

ActivRecycle helped achieve this 50 percent cash-management savings through...

- Savings in back-office cash handling, counting, risk and error costs
- Improved branch security and reduced likelihood of fraud
- Savings in cash-replenishment and transport costs
- Reduced full-time equivalent staffing expenditures and ATM cash-operations investment

Estimated 50 percent overall
50% cash-management savings

POLAND

BZWBK (Santander Poland) is the third-largest bank in Poland, focused on serving retail and small/medium enterprise customers across 658 branches and 131 agencies. While the bank has long operated standard ATMs with cash/check-deposit modules (CCDM), changes in consumer behavior necessitated a change. A growing number of deposit operations, a 3:1 withdrawal-to-deposit ratio and an average of only 1.19 self-service devices per location meant the bank had to find a way to handle cash more efficiently. In 2016, they found the answer to their challenges in Diebold Nixdorf CRS machines with full recycling capabilities.

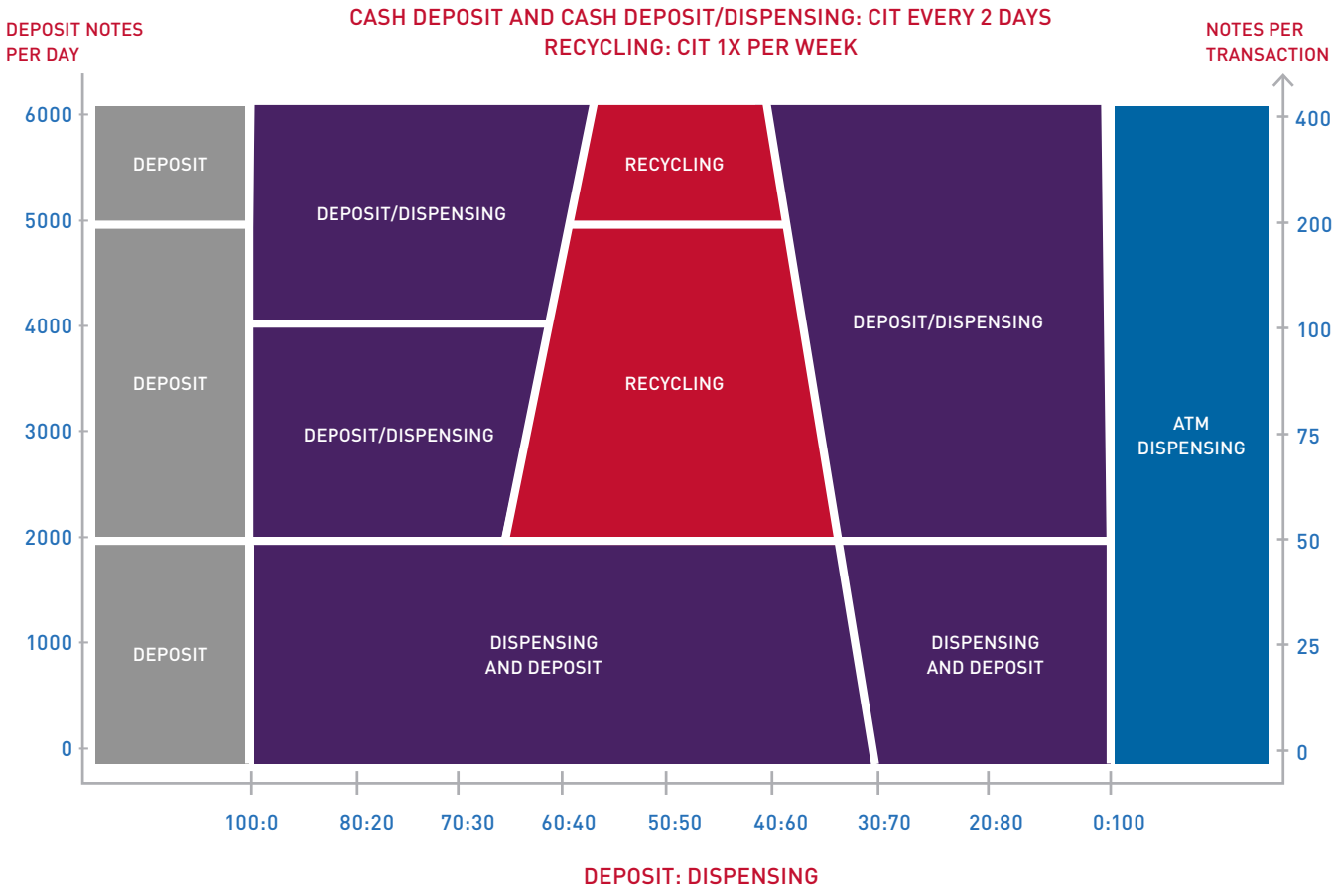
Having installed 130 Diebold Nixdorf CRS devices, Santander Poland has relaized a number of benefits:

- Reduction of cash-handling costs as deposits are automatically placed back into circulation
- Compliance with European Central Bank rules regarding counterfeit note detection
- Higher terminal availability due to lower failure rates, thanks to more cash availability
- Migration of teller desk transactions to CRS terminals in the self-service area

Due to their success with cash-recycling technology, the bank now plans to switch their branch network to a "cashless branch" model where most cash operations are handled in self-service devices.

Is Cash Recycling Right for your Financial Institution?

Diebold Nixdorf's cash-recycling technology can make an impact on financial institutions' cash-handling needs and costs, but just how big an impact depends on factors such as transaction volume and your deposit-to-dispense ratio. The following chart should give you an idea at what point a recycling terminal would make sense versus an intelligent deposit terminal.



Find the Right Option for your Operation

While the case for cash recycling is strong across the globe, not every financial institution's needs are the same. If you do decide cash recycling makes sense for your operations, you have options. Find a fit that suits your business model from our full family of cash-recycling self-service terminals.

PRODUCT MATRIX

	CASH RECYCLERS								
									
	CS 4040***	CS 4060***	CS 4080***	CS 828**	CS 4560***	CS 4580***	CS 868**	CS 4090***	CS 9900**
	Cineo C4040	Cineo C4060	Cineo C4080	Opteva 828	Cineo C4560	Cineo C4580	Opteva 868	Cineo 4090	Diebold 9900
SECURITY									
Portrait/Cash Slot Cameras	•	•	•	portrait only	•	•	portrait only	•	•
Card Reader Cameras	•	•	•		•	•			
Consumer Awareness Mirrors	•	•	•	•	•	•	•		
Intruder Alarm System	•	•	•		•	•		•	
Basic Alarms or Sensors	•	•	•	•	•	•	•		•
Enhanced Alarms				•			•		•
TMD 6001				•			•		•
ASKIM II	•	•	•		•	•		•	
Multiple Sensor Secured Cassette	•	•	•		•	•		•	
Ink Staining	•	•	•		•	•		•	
Encrypting PIN Pad (EPP)	•	•	•	•	•	•	•	•	•
Safe - UL 291 Business Hour	•								
Safe - UL 291 Level 1	•		•			•			•
Safe - CEN L	12.5mm	40mm	40mm	12.5mm	40mm	40mm	12.5mm	40mm	
Safe - CEN I									•
Safe - AIE S/G							•		
Safe - CEN III		•	•		•	•		•	
Safe - CEN III GAS									•
Safe - CEN III EXGas		•	•	•	•	•	•		
Safe - CEN IV		•	•		•	•		•	
Safe - CEN IV GAS									•
Safe - CEN IV EXGas		•		•	•		•		
Safe - CEN VI EX					•				
DISPLAYS									
15" XGA Color Consumer Display, Touchscreen or Vandal-Resistant Screen	•	•	•	•	•	•	•		
17" SXGA Color Consumer Display, Touchscreen		•	•						
19" SXGA Color Consumer Display, Touchscreen									•
18.5" LCD Color Consumer Display (Landscape) with Touchscreen, 18.5" Secondary Screen for Advertising								•	
High Bright	•	•	•	•	•	•	•		•
Privacy Filter	•	•	•	•	•	•	•	•	•
10.4" ActivView Secondary Consumer Display									•
10.4" Rear Service Operator Panel	•	•	•		•	•	•	•	•
PROCESSORS									
i5 Processor	•	•	•	•	•	•	•	•	•
i3 Processor	•	•	•		•	•		•	
Celeron	•	•	•		•	•		•	
POWER ARCHITECTURE									
Basic Power Architecture	•	•	•		•	•		•	
Uninterruptable Power Supply (UPS)		•	•	•	•	•	•	•	•
CONSUMER EXPERIENCE									
Headphone Jack	•	•	•	•	•	•	•	•	•
Service Teller Call Button								•	•
Countertop Panel									•
Branding Panels	•	•	•		•	•		•	
2-Way Video Camera/Microphone									•
Alphanumeric Keyboard	•	•	•	•	•	•	•		
ID DEVICES									
Fingerprint Reader	•	•	•						
ActivEdge (EMV-Ready)				•	•	•	•		•
EMV-Ready Card Reader Options (Motorized, Dip)	•	•	•	•	•	•	•	•	•
NFC via Card or Smartphone	•	•	•	•	•	•	•	•	•
1D/2D Barcode Scanner	•	•	•	•	•	•	•	•	•
A6 Single-Check Scanner					•	•			
Driver's License Scanner									•
A4 Single-Sided Scanner									•
PRINTERS									
80 mm Standard Graphical Receipt Printer								•	
80 mm Enhanced Graphical Receipt Printer	•	•	•	•	•	•	•	•	•
80 mm Enhanced Graphical Receipt Printer - Dual Paper Roll (10" Roll & 7" Roll)		•	•		•	•			
Passbook Printer		•	•		•	•			•
Passbook/Document Combo Printer									•
Journal Printer	•	•	•	•	•	•	•		•
DISPENSERS/DEPOSITORS									
Single-Check Acceptor					•				
ActivCheck Bulk-Check Acceptor				•			•		•
Bulk-Check or Cash Acceptor - CCDM V1			•			•		•	
ActivMedia Mixed-Media Acceptor									
Mixed-Media Acceptor - CCDM V2			•					•	
Coin Dispenser		•	•	•	•	•	•		•
Coin Deposit		Sidecar	•						
Coin Recycler								•	•
Advanced Function Dispenser				•			•		•
ActivRecycle High-Performance Cash Recycler				•			•		•
High-Performance Cash Recycler - RM3	•	•	•		•	•		•	
3-Compartment Reject & Retract Cassette	•	•	•		•	•		•	
CCMS Capability	•	•	•		•	•		•	
PLATFORM SW									
Operating System	Win 7	Win 7	Win 7	Win 7	Win 7	Win 7	Win 7	Win 7	Win 7
Latest XFS Version				4.1			4.1		4.1
Latest ProBase Version	PBC 1230	PBC 1230	PBC 1230		PBC 1230	PBC 1230		PBC 1230	

**System includes ActivRecycle™ technology

***System includes RM3™ technology

Diebold Nixdorf

To learn more, **visit DieboldNixdorf.com**