Due Diligence Report  |  DISCOVER® DEBIT

Signature Debit Program

ABA Endorsed Solution Due Diligence Report

See the Seal. Trust the Solution.
Introduction

The American Bankers Association is committed to helping banks run strong and efficient organizations. This due diligence report provides an overview of the research we conducted, through our subsidiary the Corporation for American Banking, which led to the ABA endorsement of Discover® Debit, a signature debit program.

ABA's mission is to meet bankers' needs through product evaluations and vendor due diligence. Our process focuses on researching product solutions that have been identified by ABA member banks. We begin by soliciting feedback from bankers through committees, focus groups, surveys and our Banker Advisory Council. All of this helps us identify and prioritize our research in areas that provide significant benefits to our bankers. We then work closely with third-party industry specialists and ABA staff experts, conducting extensive research to determine the solutions that will earn the exclusive ABA endorsement.

Our research focuses on the following areas:

- Financial Analysis
- Management Strength and Ownership
- Long-Term Stability
- Solution Functionality
- Partnerships
- Pricing
- Liability
- Information Security
- Disaster Recovery
- Regulatory Requirements
- Compliance Functions
- Legal Opinions
- Customer Service
- Banker References
- Competitive Landscape

This report is designed as an industry analysis tool providing you with valuable product and third-party provider information.

We hope you find it helpful as you conduct your own due diligence on signature debit programs.
Executive Summary

The Discover® Debit signature debit program was developed to provide financial institutions with a new, uncomplicated alternative to other signature debit programs. The program focuses on the needs of banks and their customers by providing superior program economics, marketing support, security and reliability.

Financial institutions that choose Discover® Debit benefit from:

- **Superior Economics**—Highly competitive interchange and lower fees can improve profitability.

- **Security**—Network security features, including fraud alerts and authorization blocking, help banks minimize loss from fraudulent activities.

- **Simplicity**—Transparent program fees, operating rules and card specifications are easy to understand, clearly explain costs and make managing the program easy.

- **Flexibility**—Greater flexibility puts the issuer’s needs first, including the ability to select their own PIN network and develop the program with a focus on their brand.

Discover® Debit delivers comprehensive fraud mitigation features, branding flexibility and marketing support. The attractive revenue opportunities and competitive program features enable issuers of all sizes to experience a fresh alternative to other debit programs. With Discover® Debit, banks can develop a more profitable debit program that makes their brand stand out.

A comprehensive examination of Discover® and its ability to service financial institutions of all sizes led ABA, through its subsidiary the Corporation for American Banking, to endorse the Discover® Debit signature debit program.
Company Overview

Discover Financial Services (NYSE: DFS) is a direct banking and payment services company with one of the most recognized brands in U.S. financial services. Its banking business includes Discover card branded credit cards, private student loans, personal loans, checking and savings accounts, certificates of deposit and money market accounts. Since its inception in 1986, the company has become one of the largest card issuers in the United States. Through its payment services company it operates PULSE, one of the nation’s leading ATM/debit networks, Diners Club International, a global payments network and the Discover Network, which includes credit, debit and prepaid cards issued by third parties.

PULSE was organized in December 1980 and incorporated on July 29, 1981. For its first 25 years, PULSE operated as a not-for-profit association owned by its member financial institutions. In 2005, DFS Services, LLC, ultimately a wholly-owned subsidiary of Discover Financial Services, acquired PULSE. PULSE is a Delaware limited liability company. Discover Debit, the ABA-endorsed signature debit program, is supported by PULSE.

For more information, visit discover.com/company.
Solution

The Discover Debit signature debit program offers financial institutions—like ABA member banks—a fresh, uncomplicated alternative to other signature debit programs. Discover Debit delivers a more profitable signature debit solution that currently provides an interchange lift of up to 15 basis points when compared to other networks.

Discover Debit offers flexibility that will help ABA member banks stand apart from their competitors. From product enhancements to the product marketing and communications strategy, the Discover Debit team can support the ABA member bank.

- **Superior Economics**—Discover Debit boosts revenue through a highly competitive interchange and lower network fees.
- **Security**—Discover Debit uses a comprehensive fraud mitigation service, which provides early warning fraud detection based on neural network technology. Optional custom rules and blocking enable ABA member banks to see and score transactions, delivering more control of the fraud mitigation strategy. Discover Debit also offers a full range of EMV solutions and support to help plan a migration to chip card technology.
- **Simplicity**—Discover Debit provides streamlined billing, allowing for greater reporting transparency. Operation regulations are simple. All activity is tracked in an online analytics tool that allows ABA member banks to easily monitor and optimize their program.
- **Flexibility**—The Discover Debit team takes a flexible approach and works with issuers to build a program that suits the needs of their customers and offers features cardholders want. With no mandates, an ABA member bank will remain in the driver’s seat; empowered to make the choices that are best for the bank's bottom line.

—Rick Claypoole, Product Management and Marketing, Cadence Bank, a regional bank with a network of 80 locations across Alabama, Florida, Mississippi, Tennessee and Texas
Marketing Support

Discover Debit offers benefits that appeal to cardholders and set ABA member banks apart from the competition. These benefits include lowest purchase price guarantee and identity theft defense. Discover Debit is supported by PULSE InSights®.

PULSE InSights consulting services delivers solutions and support to guide ABA member banks through the conversion to Discover Debit, including:

- Online tools and marketing best practices to help plan the bank’s rollout;
- End-to-end collaboration on conversion of the bank’s debit card program, with assistance from a Discover Debit marketing consultant and continued support beyond the conversion; and
- A suite of brand assets and collateral, plus the flexibility and choice to customize a debit card program that delivers real value to the bank’s cardholders and helps grow the bank’s portfolio.

The Discover Debit team will help ABA member banks measure debit card portfolio performance against a benchmark. The benchmarks come from the annual Debit Issuer Study, commissioned by PULSE, a Discover Company, and conducted by Oliver Wyman, a leading global management consulting firm. The study presents an objective, fact-based perspective on debit card issuer performance. The sample is nationally representative, with financial institutions distributed by size, geography and debit network affiliation. Debit card issuers’ performance metrics (card usage, average ticket size and debit card fraud losses) are gathered and analyzed in specific areas.
Technology

Discover Digital Exchange

Discover Digital Exchange (DDX) is a comprehensive solution that makes it easy for Discover Debit issuers to support all digital wallets and tokenized transactions, including NFC transactions and in-app mobile purchases. The service will perform token generation, provisioning, token-to-PAN mapping during transaction processing, token lifecycle management and more on behalf of Discover issuers, issuer processors and other partners. It is based on the EMVCo Payment Token Standards and supports the new token data fields and transaction processing guidelines. It will provision tokens into any DDX-compliant wallet in which an issuer chooses to participate.

With DDX, Discover Debit issuers will have:

- One solution to provision and manage tokens in any digital wallet, regardless of the type of device or operating system.
- A solution that will support digital wallets that use chip-based secure element, and wallets using cloud-based host card emulation.
- One simple Web portal for token lifecycle management, which provides issuers a secure, standardized user interface to view token status and history, and conducts token lifecycle management actions—activating, revoking and suspending tokens as needed.
- A solution that enables transactions to be routed to alternative networks by providing token-PAN mapping and cryptogram validation services, allowing issuers to satisfy Regulation II requirements

Discover Debit transactions initiated from different wallets will be standardized, with the goal of minimizing the need for issuers and issuer processors to modify authorization systems or perform certification testing again as new digital wallets and use cases are introduced into the market.
Network Monitoring

Discover utilizes a variety of commercially available “best-in-class” applications, as well as vendor proprietary applications, to manage the core systems, applications and network infrastructure. One of the primary applications used to manage the network switch is the statistics monitor, STATMON.

Statistics Monitor

STATMON is a statistics monitoring software module from Fidelity Information Systems that functions as an early warning system to detect substandard authorization rates, inordinate numbers of consecutive denied transactions, slow processor response times and other operational issues.

Specific criteria for each processor are established to act as “triggers” for substandard activity. When a trigger is activated for a given processor, an investigation process to determine the source of the problem begins. The network operators will escalate to the direct processor and/or within Discover through the established escalation procedures.

Switch Processor Escalation Data

All processors are required to submit a completed Switch Processor Escalation Data Form prior to going live. This form contains contact information to be used in the event the processor link experiences a problem that requires immediate attention. This form must be submitted at least two weeks prior to conversion.

An annual audit of each direct processor’s data center escalation information is performed each year. During this period, the current information will be sent to each processor, with the requirement to reply with positive acknowledgement or with appropriate updates when necessary.

Network Bulletins

Semi-Annual Release Schedule

Discover manages all technical updates through a semi-annual release cycle. These two releases occur in April and October of each year, with documentation typically provided six months in advance. The current release guide and supporting technical documents are posted online in October for the April release and in April for the October release. A network bulletin is distributed to all direct processor primary contacts providing notification of the
availability of the material. Processors generally have six months to prepare for, code to and certify the technical updates.

The Discover Debit and Prepaid Issuer Operating Regulations (along with the *Dispute Rules* manual and technical specifications) are released according to the April and October schedule as well.

**Material Updates**

A network bulletin is distributed to all direct processor primary contacts providing notification of updated materials that include user manuals such as the operating rules and procedures, the information exchange manual and processor conversion manual. Electronic documentation outlining the new changes, as well as PDFs of the updated manuals, are sent via network bulletin to all participants.

**Implementation**

The following support teams oversee Discover Debit implementations.

**Experienced Account Manager**

The overall program lead is available to manage any and all aspects related to the business relationship.

**Implementation Project Manager**

A dedicated implementation project manager (IPM) will be assigned to manage the entire implementation project. This person will work in conjunction with assigned ABA member bank personnel at the processor and bank site(s) and all departments within Discover. This individual is ultimately responsible for the overall success of the implementation project.

The IPM will hold weekly meetings, oversee the certification process and coordinate the implementation into the production environment. The IPM is also responsible for monitoring production implementation, watching live transactions as they occur and reviewing them for accuracy.

Lastly, the IPM will monitor activity for 30 days after the conversion. The IPM will then turn over the support of the bank’s account to either a dedicated processor relationship manager (PRM), if there is a direct connection to the network, or the account manager, if the bank uses a third-party processor for Discover Debit.
**Processor Relationship Manager**

If there is no direct connection to the network, support comes from the ABA member bank’s third-party processor and the Discover Debit account manager. However, ABA member banks with a direct connection to the network will be assigned a dedicated PRM to manage the ongoing relationship needs of the processor upon completion of the implementation process. The PRM will act as the processor’s primary contact at the network.

**Network Support**

Discover provides support for the network telecommunications and online and offline applications via its Network Operation Center (NOC) and its Command Center. Any ABA member bank that has a direct connection to the network can contact the network operator at any time to inquire about the interfacing link or other network problems at the following:

<table>
<thead>
<tr>
<th>Phone:</th>
<th>(866) 315-0350 (U.S. toll-free)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(832) 214-0350 (local)</td>
</tr>
<tr>
<td>E-mail:</td>
<td><a href="mailto:DataCenterOperations@pulsenetwork.com">DataCenterOperations@pulsenetwork.com</a></td>
</tr>
</tbody>
</table>

NOC and Command Center personnel and their supervisors are onsite and on-call at all times.

If there is no direct connection to the network, support would come from the ABA member bank’s third-party processor and the Discover Debit Account Manager.

**Training**

The Discover Debit team provides training using the most cost-effective means possible. Generally, training and support for pre/post-conversion are not applicable, as system access and introduction are established as part of the implementation process. Systems were designed to be intuitive to users and easy to use.

Discover Debit team members are also available to set up individualized webinars specific to each bank’s needs on a case-by-case basis. All webinars are offered in a recorded version to meet the bank’s training needs at any time.
Risk Management

Data Security

Discover employees follow strict guidelines as stated in the company's acceptable use policy (AUP). Discover Financial Services, its affiliates and subsidiaries created this policy to ensure the appropriate security of the company's proprietary and confidential information on any computer or electronic resource used to maintain, transmit, download, view, post, distribute or otherwise access or make available an information asset. The AUP applies to all employees, contractors and contingent workers of Discover Financial Services.

Background checks are conducted by a third-party vendor prior to an offer of employment for potential employees. Background checks are also conducted for contractors and vendors by the Discover physical security department or by the contractor's company of employment. If a change in contractor or vendor employment status occurs, and that employee becomes a Discover employee, a background check will be conducted again as if this person were a new hire.

All contractors and vendors doing business with Discover must pass drug testing, which is administered by their company of employment and recorded on file.

In addition to background checks, all employees, contractors and vendors are fingerprinted; fingerprints are then submitted to the Federal Bureau of Investigation (FBI). Approved FBI background checks are kept on file during the employee's tenure or contract with Discover. These files are kept for two years after termination. Background checks include:

- Fingerprints (submitted to the FBI)
- Drug testing
- Criminal record search
- Education verification
- Employment verification
- Social security number search

An offer of employment will be extended when background checks and FBI fingerprints are returned without incident. Potential employees must also comply with drug testing within 48 hours of receipt of the employment offer.
The Discover Debit program falls under the umbrella of its parent company, Discover Financial Services, as it pertains to security of data. Discover has a strong commitment to maintain the security and privacy of its information assets as well as those of its customers and business partners. At Discover, information security is an integral component of the planning, design and implementation of business and technology initiatives. Discover employs a variety of safeguards to help protect proprietary and confidential information assets, including the promotion and education of the following:

- **Information Security Policy**—includes directives and rules that describe how the organization manages, protects and distributes information.

- **Data Handling Guidelines**—identifies examples of highly sensitive data and the proper procedures for handling such data, including shipping, destruction and distribution.

- **Acceptable Use Policy**—outlines the terms and conditions for the use of information assets, including equipment and services. All users must affirm their understanding of and compliance with the AUP on an annual basis from the time of hiring.

- **Encryption Tools**—include Guardian Edge hard disk encryption for laptop computers; PGP (Pretty Good Protection) encryption for files, folders and other media (including e-mail in certain circumstances); and “External Encryption” (also known as “Gateway Encryption”) for standard external e-mail protection.

- **Integrity Hotline**—offers employees access to a hotline to report concerns about potential violations of the law, a regulation or a company policy, including concerns regarding regulatory compliance, bribery or other improper payments, potential money laundering or other suspicious activity, improper conflicts of interest, etc.

Discover maintains information for all network customers such as acquirers, processors and merchants within its operational production and data warehousing environment. Cardholder information is not available to the network. Discover does not store sensitive customer information other than primary account numbers (PAN).

Discover handles PAN data of ABA member bank customers for the purpose of switching, routing and settlement. Discover is PCI DSS compliant and its background check policy has been audited by the Federal Reserve. The audits are conducted annually through Discover’s internal audit group.
In the event of a security compromise, Discover follows the network incident communications plan. Discover ensures the incident has been contained by conducting an investigation, maintaining a log of all actions taken to ensure proper documentation and isolating compromised systems from the network, including wireless. All evidence related to the incident is preserved while simultaneously taking the steps necessary to mitigate and/or prevent further damage. Initial notifications are sent within 10 to 20 minutes of an incident, and then account managers initiate phone calls to key contacts within that same timeframe.

Disaster Recovery

Discover operates two data centers, utilizing an active/active configuration with full physical and logical redundancy between both sites. The primary data center, the Support Services Building (SSB), is located at the Discover headquarters in Riverwoods, Illinois, approximately 30 miles north of Chicago. The alternate data center is located in the Discover Data Center in New Albany, Ohio, approximately 20 miles from Columbus. The distance between the SSB and the New Albany data center is approximately 400 miles.

The data centers are remotely managed by the staff of the command center and the network operations center (NOC). Each physical data center has staff available 24/7 in the event of routine maintenance or during a disaster recovery event. The command center and NOC fall under a single chain of command and are operated out of PULSE’s headquarters in Houston. In addition to the technology organization structure in Houston, all communications are driven out of this office as well. The concentration of command level decision making residing in one office allows for a more concise flow of information.

Each data center is capable of handling 100 percent of transaction traffic for disaster recovery and business continuity purposes. Transaction traffic is load balanced between data centers on a business-as-usual basis. Traffic can be routed from one data center to the other at the application and network levels to allow for zero impact to online processing for scheduled outages, and to allow for minimal impact in case of an unscheduled outage. In addition to Discover’s data center redundancy configuration, redundancy is also incorporated at the hardware, application and network levels to ensure maximum availability. The data centers are designed with dual power feeds from independent sources. UPS and generator systems are also present in the data center design for both facilities.

In the event of a security compromise, Discover conducts an investigation to ensure the incident has been contained. Discover takes the necessary steps to mitigate and/or prevent further damage, including the isolation of compromised systems from the wired and wireless networks. Discover procedures ensure that all evidence related to the incident is preserved, including completion of proper documentation for investigation.
Contract employees must follow the same policies and procedures as permanent employees. Access to systems is immediately terminated upon termination of employment, whether it is voluntary or involuntary. In a voluntary termination, system access is removed effective the day of termination. In an involuntary termination, system access is removed during the meeting in which the employee is notified of their termination.

**Regulatory Compliance/Compliance Management**

As a bank holding company, Discover complies with all applicable laws and is reviewed by applicable governing bodies, including the Federal Reserve, the Consumer Financial Protection Bureau, the Securities and Exchange Commission, etc.

Discover is PCI DSS compliant, has been audited by the Federal Reserve and has completed internal audits, including the SSAE16. Exam results may be requested directly from the regulating agency. Discover is not permitted to distribute any exam results.

Discover Debit is a product offering of PULSE. PULSE’s compliance statement addresses the federal regulatory privacy requirement in Title V of the Gramm-Leach-Bliley Act.

In the Compliance area, some staff hold the Certified Regulatory Compliance Manager and Certified Anti-Money Laundering Specialist certifications. Discover has its own in-house risk and compliance teams. Both Discover and PULSE have in-house legal counsel authorized to practice in many jurisdictions.

Regulation II (Debit Card Interchange Fees and Routing) requires a debit issuer to enable its cards for acceptance in at least two unaffiliated networks. Discover Debit provides a more profitable signature debit network, without mandating use of the PULSE network, thereby empowering banks to maximize their revenue and minimize their costs under Regulation II rules.

Discover has met with Federal regulators about the Discover Debit product. Discover Debit was reviewed by the Federal Reserve and there were no findings.
Management Strength

David W. Nelms, Chairman and Chief Executive Officer
David Nelms was elected chairman of the board in 2009. He has served as chief executive officer since 2004, and was president and chief operating officer from 1998 to 2004. Prior to joining Discover, he worked at MBNA America Bank from 1991 to 1998, most recently as a vice chairman. From 1990 to 1991, He was a senior product manager for Progressive Insurance. From 1986 to 1990, he was a management consultant with Bain & Company. He holds a bachelor’s degree in mechanical engineering from the University of Florida and an MBA from Harvard Business School.

Roger C. Hochschild, President and Chief Operating Officer
Roger Hochschild has served as president and chief operating officer since 2004, and was executive vice president and chief marketing officer from 1998 to 2001. From 2001 to 2004, he was executive vice president, chief administrative and chief strategic officer of Morgan Stanley. He holds a bachelor’s degree in economics from Georgetown University and an MBA from the Amos Tuck School at Dartmouth College.

R. Mark Graf, Executive Vice President, Chief Financial Officer
Mark Graf joined Discover in 2011 as executive vice president and chief financial officer. Prior to joining Discover, he was an investment advisor with Aquiline Capital Partners, a private equity firm specializing in investments in the financial services industry. Prior to that, he was a partner at Barrett Ellman Stoddard Capital from 2006 to 2008. He was executive vice president and chief financial officer for Fifth Third Bank from 2004 to 2006, after having served as its treasurer from 2001 to 2004. He holds a bachelor’s degree from the Wharton School of the University of Pennsylvania.

Kelly McNamara Corley, Executive Vice President, General Counsel and Secretary
Kelly McNamara Corley has served as executive vice president, general counsel and secretary since 2008. She previously served as senior vice president, general counsel and secretary since 1999. Prior to becoming general counsel, she was managing director for Morgan Stanley’s global government and regulatory relations. She holds a bachelor’s degree in political science from the University of Southern California and a JD from George Mason University School of Law.

Steven E. Cunningham, Senior Vice President, Chief Risk Officer
Steven Cunningham has served as senior vice president and chief risk officer since May 2013. He is also responsible for Discover’s Comprehensive Capital Analysis and Review and Resolution Planning program offices. He joined Discover in 2010 as senior vice president and treasurer. Prior to joining Discover, he held senior management roles with Harley-
Davidson Financial Services, Capital One Financial and the FDIC. He holds a bachelor’s degree from the University of Alabama and a master’s degree from the George Washington University.

Carlos Minetti, Executive Vice President, President – Consumer Banking
Carlos Minetti has served as executive vice president and president of consumer banking since February 2014. He was appointed to oversee consumer banking products in 2006 and led cardmember services from 2001 to 2006. Prior to joining Discover, he worked in card operations and risk management for American Express from 1987 to 2000, most recently as senior vice president. He holds a Bachelor of Science degree in industrial engineering from Texas A&M University and an MBA from the University of Chicago.

Diane E. Offereins, Executive Vice President, President – Payment Services
Diane Offereins was named executive vice president, payment services in 2008 with responsibility for Discover Network, PULSE and Diners Club International. She was executive vice president and chief technology officer from 1998 to 2008. She has overseen the PULSE Network since 2006. From 1993 to 1998, she was at MBNA America Bank, most recently as senior executive vice president. She holds a Bachelor of Business Administration degree in accounting from Loyola University.

Dave Schneider, Senior Vice President of Corporate Debit Strategies
Dave Schneider serves as the president of PULSE and evaluates debit growth opportunities, including acquisitions, alliances and new products on behalf of Discover. Before joining PULSE in September 2000, he was a partner in the Houston law office of Fulbright & Jaworski L.L.P., practicing in the Corporation, Banking and Business department. He has a BA in economics, summa cum laude, from Tulane University and a JD, magna cum laude, from Georgetown University Law Center.

James V. Panzarino, Executive Vice President, Chief Credit and Card Operations Officer
James Panzarino has served as executive vice president and chief credit and card operations officer since February 2014, after serving as chief credit risk officer since 2006. He was senior vice president of cardmember assistance from 2003 to 2006. Prior to joining Discover, he was vice president of external collections and recovery at American Express from 1998 to 2002. He holds a bachelor’s degree in business management and communication from Adelphi University.
R. Douglas Rose, Senior Vice President, Chief Human Resources Officer
Doug Rose joined Discover in April 2013 as senior vice president and chief human resources officer. Prior to joining Discover, he was vice president, human resources at United Airlines. He was also senior vice president, human resources at Capital One and a human resources consultant for Hewitt Associates. He holds a bachelor’s degree from the University of Pennsylvania and a master’s degree from the University of Michigan.

Glenn P. Schneider, Senior Vice President, Chief Information Officer
Glenn Schneider joined Discover in 1993 and is senior vice president and chief information officer. Prior to being named CIO in 2008, he was responsible for application development and marketing applications. Prior to joining Discover, he worked for Kemper Financial Services as a programmer. He holds a bachelor’s degree in economics and computer science from Northern Illinois University.

Harit Talwar, Executive Vice President, President – U.S. Cards
Harit Talwar was named executive vice president, card programs and chief marketing officer in 2008. He was executive vice president of the Discover Network from 2003 to 2008. From 2000 to 2003, he was managing director for Discover’s international business. Previously, he held positions at Citigroup from 1985 to 2000, most recently as country head of the consumer banking division in Poland. He holds a BA Hons degree in economics from Delhi University in India and an MBA from the Indian Institute of Management, Ahmedabad.

Financial Information
Please refer to the 2014 Discover Annual Report. Go to: investorrelations.discoverfinancial.com
About the Corporation for American Banking

ABA endorsed solutions help banks make money, save money, diversify income and improve efficiency. Backed by our comprehensive due-diligence process, these select solutions are analyzed by industry experts, field-tested by bankers and meet stringent quality and customer-service standards. From compliance and insurance to payments and mortgage lending, you’ll find products and services to enhance your bank’s bottom line.

About the American Bankers Association

The ABA is the voice of the nation’s $15 trillion banking industry, which is composed of small, regional and large banks that together employ more than 2 million people, safeguard $11 trillion in deposits and extend more than $8 trillion in loans.

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