

Central Bank Cooperation in Counterfeit Deterrence

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Abstract

Central banks are the providers of banknotes in most countries of the world. Counterfeit deterrence is a critical aspect of a currency issuing authority's duty to maintain the confidence of the public in the currency of their country. Governors of the central banks of a number of industrialized nations have joined together to address the threats posed by digital imaging technologies. They sponsored the creation of the Special Studies Group 2 (SSG 2) which conducts research and proposes new deterrents to the counterfeiting of banknotes.

Introduction

Banknotes are produced with layers of security features that make it possible for users to identify them as genuine, and difficult for counterfeiters to duplicate them. The public in many countries has come to expect banknotes to have high quality intaglio and lithographic printing on special watermarked papers. Holographic images and inks with color shifts or other properties have become common. Security features in banknotes increase the time, cost and effort necessary to produce counterfeits.

For many years representatives of central banks have shared information with each other about counterfeiting threats and defenses. The emergence of color copiers, followed by an avalanche of digital devices capable of reproducing images, has caused fundamental changes in central bank cooperation for counterfeit deterrence. Casual counterfeiting has emerged as a new threat. Prior to the availability of color copiers and personal computers, counterfeiting of currency required skill to effectively replicate its special pre-press and printing techniques, as well as the unique materials used in the production of banknotes. But in the 1990's it became possible for persons with no graphic arts training or skills to duplicate banknotes. The public in many countries has begun to hear stories of young people found to have created counterfeit banknotes on the PCs in their homes and schools. The machines that facilitated these counterfeits are made by a relatively small number of companies and marketed in countries around the world.

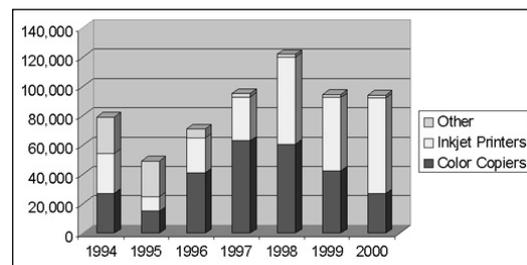
The central banks recognized that the threat posed by digital imaging technologies was common to them all, and that by acting together they might develop more powerful solutions than if each worked in isolation. The central bank Governors formed the Special Studies

Group 2 to investigate the digital counterfeiting problem, and to develop solutions that can be implemented globally across banknote designs. The SSG 2 Plenary Group is composed of senior representatives of the central banks. A Technical Working Group of scientists, security specialists and other experts supports its work.

Color Copiers

In 1992 the Governors of the central banks of the G 10 countries were made aware of the threat posed to the security of banknotes by color copiers. The Governors meet regularly to discuss matters of common interest. Only rarely do their official discussions involve counterfeiting. Action on the color copier issue may mark the moment when central bank relationships evolved beyond the sharing of data and information about counterfeiting and deterrence methods. From then on, they have worked to identify threats and areas where common action by banknote issuing authorities would be of greater impact than individual action. The Governors tasked their central banks to develop a mechanism for working together with equipment manufacturers, to discover whether it was possible to prevent color copiers from reproducing banknotes, and to develop a solution useable by all.

In 1992 the Governors issued a press release that called on the color copier industry to support the effort to prevent copying of banknotes. From 1993 through 1996, the SSG 2 worked very closely with the Japanese Business Machine Manufacturers Association. Their joint efforts resulted in the development and deployment of technology that prevents color copiers from reproducing banknotes.



Counterfeit Notes Recovered in Canada¹

Personal Computer Systems

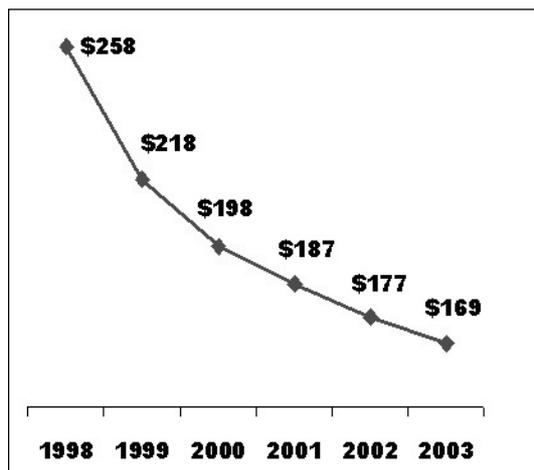
The SSG 2 was encouraged by the effectiveness of its efforts to reduce the impact of counterfeiting by color copiers. By 1996, it was becoming apparent that a further trend was developing rapidly. Color reproduction of banknote images by readily available computer systems was becoming significant.

I. Personal Computers

Over the past year, the price of an average consumer home computer system fell to below USD \$1,000. A low-end, entry-level PC device became available for USD \$500.

Feature	January 1999	January 2000	November 2000
Cost	\$1,249	\$949	\$1309
CPU	333Mhz	433 Mhz	800Mhz
Memory	32 MB	64 MB	128 MB
Hard disk	4.3 GB	13.4 GB	40 GB

II. Inkjet Printers



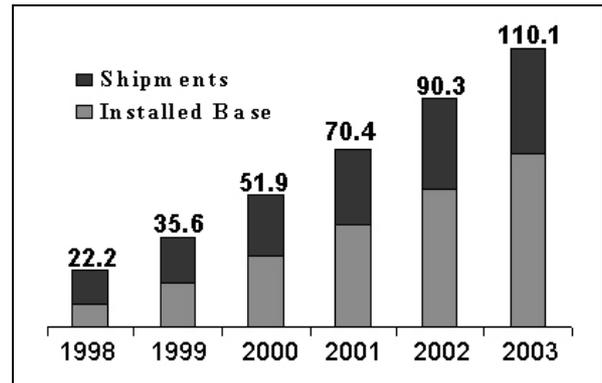
Average Street Value of Colour Inkjet Printers²

At the same time, the processing power of that average system is increasing by about 30% year to year, and standard PC configurations have more memory than a year ago. This trend in increased power will continue, while pricing in all three categories of PC products will stabilize or even decrease.

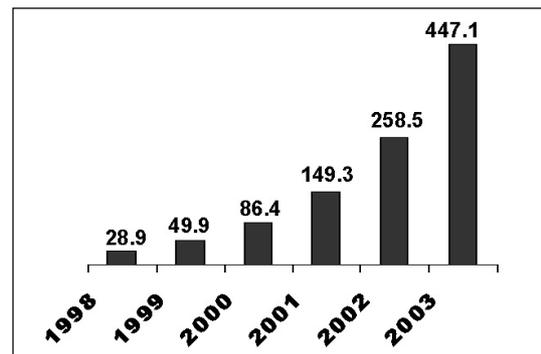
The quality of color inkjet printers has begun to equal traditional photographic printing output, according to recent industry surveys. Volume shipments of these devices are driven in part by the boom in digital home photography and increased availability of color scanners. As printer quality improves and volumes increase, prices continue to fall.

III. Flatbed Scanners

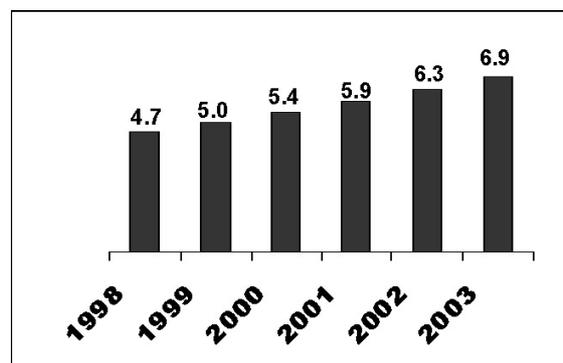
Continuing a three-year trend, color scanner sales are still increasing. These devices are increasingly easy to operate, with new one-button scanning features. Image quality and resolution of these scanners also continue to increase.



Scanner Installed Base at Year-end in Millions³



Consumer Photo Imaging Software World-wide in Millions⁴



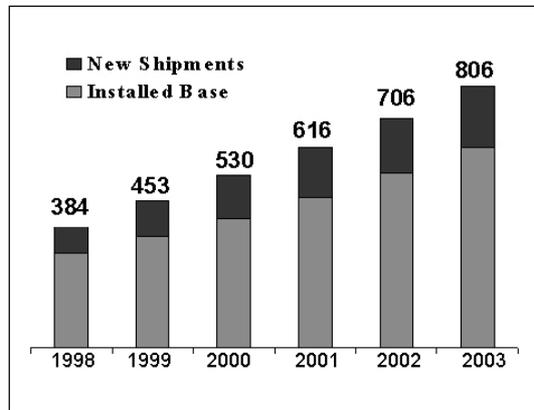
Commercial Photo Imaging Software World-wide in Millions⁵

IV. Image Editing

As it becomes more common for consumers to process images in their day-to-day use of computers and the Internet, they are able to obtain image-editing applications that are easier to use. The older and cheaper versions are today often bundled with the purchase of a scanner. Professional features, such as cropping and sizing, contrast and density control, and color correction, are now available as one-click options in many of today's leading products. As a result, today's average PC user can more readily scan an image and correct for scanning artifacts in preparation for printing almost any required image compared to a year ago.

As prices drop and PC power increases, professional imaging features are migrating into computers bought and used by the consumer. These applications now provide higher quality output. Advancements in image editing software, as well as

more PC power, have made it possible to process larger, high-resolution images, as well as to employ easy-to-use-filtering techniques to enhance image quality. For example, it is now easier for an average user to reproduce some security features, such as microprint, fine line patterns, and moiré-producing patterns while retaining many of the qualities of the original document as far as the general public perceives them.



Personal Computer Installed Base at Year-End in Millions⁶

SSG 2 Counterfeit Deterrence System

The many developments in digital imaging technology and its universal availability have caused a shift in counterfeiting from traditional printing methods to personal computer-based reproduction.

The central banks have funded the development of a system to deter personal computer based counterfeiting. The SSG conducted a wide-ranging survey of technologies with the potential to interfere with the capacity of personal computers to reproduce banknotes. The SSG 2 sought to translate the goal of increasing the cost, time and visibility of counterfeiting into the digital context. The essential objective is to interfere with the capacity of digital devices to reproduce currency while having a nearly imperceptible impact on the legal uses of equipment.

Currency issuing authorities that participate in the SSG 2 counterfeit deterrence system will produce a machine-readable feature in their notes. When a PC user attempts to reproduce a protected banknote, the process will be stopped and a message will appear on the user's PC screen. The message will refer the user to a Web site that provides links to the Web sites of various issuers of currency. The Web sites are a source of information about rules and regulations concerning the legal reproduction of currency.

The goal of the SSG 2 system is to create a deterrent to counterfeiting. It is expected to reduce the number of counterfeit notes by raising the barriers against easy PC based counterfeits. By making the process of using personal computers to reproduce of currency more difficult, the system is part of a comprehensive effort to significantly decrease the ability of casual counterfeiters to make and utter counterfeits. At the same time, professional counterfeiters will require greater skill and expert

knowledge to carry out their task. As a result, law enforcement officials will be able to focus their investigative efforts on skilled counterfeiting operations rather than on a large number of isolated casual ones. Professional counterfeiters can therefore be expected to return to the more traditional methods requiring special papers and inks, and equipment more easily traced than PC tools. However if they do choose to use PC tools, counterfeiters will be forced to take more intentional steps involving other persons skilled in computer technology to produce their product, resulting in a more obvious trail of evidence.

"In addition to the fact that it may be more difficult to find inkjet counterfeiters, it is more difficult to prosecute and punish suspects who use computers to generate counterfeit currency. Traditionally, there have been significant sentencing enhancements for defendants based on the amount of counterfeit currency they have either produced or passed. While the offset counterfeiter normally will produce a large amount of counterfeit currency during each run because of the time and expense necessary to conduct each run, the inkjet counterfeiter can efficiently make counterfeit currency in small batches. Thus, although inkjet counterfeiters have the potential to produce large quantities of currency, they are unlikely to receive heavy sentences because they are unlikely to have large holdings of counterfeit notes at any one time."⁷

In May of 2000 the Governors of the G 10 central banks issued a second press release on the subject of counterfeit deterrence. They identified the counterfeiting threat posed by personal computers and digital imaging tools, and they called upon the PC industry to work with the central banks to support the deployment of the system by integrating detectors in their products. Since that time the representatives of the central banks have been working with manufacturers of PC computer devices and graphics software to deploy detectors. This is the continuation of efforts to incorporate deterrence features into digital devices capable of being used in casual counterfeiting. This focus is expected to become permanent as manufacturers of a wide variety of digital devices recognize the need to cooperate in efforts prevent their products from being easily used for counterfeiting.

Conclusion

The central banks have joined together for the development of counterfeit deterrence systems to fight reproduction of banknotes by color copiers and personal computers. While the threats posed by copiers, personal computers and other digital technologies are common to all, the manifestations of counterfeiting vary by country and design. The SSG 2 has provided powerful, shared deterrents that can be included in country-by-country solutions to counterfeiting.

References

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Biography

Eugenie Foster is the Project Manager, Special Studies Group 2. She oversees the functions that support the central banks in the development and deployment of their deterrence system. Ms. Foster was the Project Director (New Currency Design) for U.S. Department of the Treasury.

Ms. Foster holds a B.A. degree from St. Lawrence University in Canton, New York and a J.D. from Villanova University, Villanova, Pennsylvania.