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**COMPUTER MATCHING: ASSESSING ITS
COSTS AND BENEFITS**

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Before the
Subcommittee on Government Information,
  Justice, and Agriculture
Committee on Government Operations
House of Representatives

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Mr. Chairman and Members of the Subcommittee:

It's a pleasure to be here this morning to discuss our reports on assessing the costs and benefits of computer matching. The results I present here come from two studies that the Committee on Government Operations requested of GAO.[1] The first examined the methods that can be used to determine whether the benefits resulting from a computer match outweigh the costs of the match. The second study looked at the factors agencies have taken into account in their decisions to conduct or continue computer matches.

As you know, computer matching has been used increasingly often and in a widening array of applications. Hopes for notable benefits and concerns for unmeasured costs have both been expressed. In particular, questions have been raised about the technical adequacy of the assessment methodology for determining the costs and benefits of computer matches, both before and after those matches are undertaken.

Before discussing our study findings, let me first mention that, in general, it has been our experience at GAO that computer matching can be a valuable tool in the investigation of fraud, waste, and abuse and in the improvement of internal controls. We have conducted computer matches and on a number of occasions have encouraged the use of computer matching by other agencies. But I would underscore that, at the same time, GAO has consistently

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[1] U.S. General Accounting Office, Computer Matching: Assessing Its Costs and Benefits, GAO/PEMD-87-2 (Washington, D.C.: November 1986), and Computer Matching: Factors Influencing the Agency Decision-making Process, GAO/PEMD-87-3BR (Washington, D.C.: November 1986).

encouraged the employment of technically adequate methods to justify claims of costs or benefits.

Now let me begin by highlighting three main points from our two reports.

First, in our review, we did not discover a well-established methodology for performing cost-benefit analyses of computer matching. Indeed, we found that research in this field is immature and that continuing methodological problems have placed the measurement of certain types of costs and benefits beyond the capabilities of routine analysis.

Second, in examining how decisions about computer matches have been made in federal agencies, we noted a generally informal approach. The agencies presently have only general guidance for documentation and for what should be considered and how it should be considered in the match decision process. We found no specific written criteria for determining whether or not a proposed match should be implemented, little documentation of what has been considered, and wide variation in the use of systematic planning procedures for developing and implementing matches. We found that the existence of improved technological capacity, legislative requirements, the extent and magnitude of the problems that were experienced (for example, overpayments being made because of unreported deaths), and concern for detecting and preventing waste, fraud, and abuse were more prominent in agency decisionmaking than the quantification of costs or benefits. Indeed, our work clearly shows that decisions

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to perform or continue a computer match are often made without systematic consideration of those costs and benefits.

Third, despite the nonexistence of an established methodology and the immaturity of current research, we concluded that it is, in fact, feasible to do useful cost-benefit analyses of computer matches. We developed guidelines for such analysis, relying in part on current agency practices. Our reports identify in detail the types of costs and the benefits that should be considered, offer suggestions on how to measure them adequately, and describe some overall criteria for reviewing analyses.

Our general principles are that all significant costs and benefits must be considered and, if possible, measured and that actual, rather than projected, data should be used in making after-match claims about savings achieved. We also believe that it is important to consider qualitative cost and benefit elements in such analyses, detailing these elements for all entities potentially affected by a match. Judgment, of course, must be used in any given match with regard to whether and how specific elements will be assessed.

WHAT WE DID

We were asked by the Committee on Government Operations to develop a methodology for evaluating the costs and benefits of computer matches and to determine how decisions to conduct computer matches have typically been made in the past,

particularly the criteria used when deciding whether a particular
computer match should be conducted.

To meet this request, we first reviewed the literature on
the costs and benefits of computer matching, on the computer
matching process, and, as applicable, on general cost-benefit
analysis. We developed from this literature a discussion package
identifying the basic issues, which we presented to a panel of
experts in various aspects of computer matching from
universities, private business, and government (see appendix I).
We then turned to the Inventory of Federal Computer Applications
to Prevent Fraud, Waste, and Mismanagement, prepared by the U.S.
Department of Labor, and matching reports of the Office of
Management and Budget to identify matches that indicated some
information on costs and benefits. We interviewed match contact
persons, asked them to identify other matches that might have
involved an assessment of match costs and benefits, and conducted
detailed reviews of the available materials. In all, we obtained
descriptive information on over 40 matches, performed an in-depth
examination of 17 match operations in nine federal agencies, and
conducted interviews with over 90 responsible agency officials.[2]

We defined computer matching as the comparison of two or
more files containing information on persons or organizations of
interest to the government in which the data on all individuals

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[2]The nine agencies were the departments of Agriculture, Defense,
Education, Health and Human Services (including the Social
Security Administration), Housing and Urban Development, and
Labor and the Internal Revenue Service, the Office of Personnel
Management, and the Veterans Administration.

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on both files are compared. This differs from related techniques such as "front-end" matching, in which a file may be searched to determine whether specific individuals who are applying for one benefit are receiving another benefit that would make them ineligible for the new award.

The committee did not ask us, nor did we try to determine, which individual matches were cost beneficial, whether computer matching in general has been shown empirically to be cost beneficial, or what circumstances or conditions might promote or preclude the performance of a cost-benefit analysis. Instead, our work focused on examining how and to what degree cost-benefit analysis was being conducted in computer-matching programs and on developing methodological guidelines that could be used for the performance of such analysis.

THE STATE OF THE ART IS IMPERFECT

Let me turn now to my first main point: although computer matching has increased in both the federal and state governments, we did not uncover a well-developed methodology for assessing the costs and benefits of computer matches. For example, in 1983, OMB prepared a computer-match checklist for agencies initiating computer matches subject to the Privacy Act. The checklist included an item requesting an estimate of the likely costs and benefits of a match, but the checklist did not specify the costs or the benefits the analysis should include or how the analysis should be performed. The literature in this area provides some

guidance but is rarely very detailed about exactly what could or should be included.

With regard to the computer matches we examined, we found that the analysis process was typically not a formal one and that technical details of the cost-benefit analyses that were conducted were not well documented. For example, reports of cost-benefit figures did not often detail what cost elements were or were not included or the basis upon which benefit figures were computed. The benefit of recovering overpayments and debt was often presented in terms of the maximum potential amount that might be collected but without acknowledgment of, or adjustment for, money that might actually be recovered. With one or two exceptions, estimates of the overpayment-avoidance benefit were presented with little or no description of the computation or its rationale or underlying assumptions. Furthermore, none of the match analyses we reviewed used discounting procedures.

We did find, however, that consensus has developed around some aspects of cost-benefit analysis. For instance, it is well accepted that the costs and benefits to a match agency are important and that, in assessing these costs, charges for computer time and the direct charges for staff time to develop match procedures and to run matches should be quantified.

We also found examples in individual agencies of techniques associated with cost-benefit analysis that were well worked out. At the Office of Personnel Management, for example, the unit responsible for performing hit verifications of several different

matches maintained daily records of the time spent on each match.
This facilitated the documentation of match personnel costs.
Again, at the Social Security Administration, the problem of
obtaining information about the data processing costs of a
computer match was resolved by means of specific billing
procedures.

FACTORS IN AGENCY DECISIONS TO INITIATE COMPUTER MATCHES

Turning to my second point, concerning agency
decisionmaking, we asked agency officials why they had decided to
initiate the matches we studied and the factors the agencies had
considered in making these decisions.

We found both general and specific factors in agency
decisions to initiate matches. As table 1 indicates, general
factors include broad concerns over waste, fraud, and abuse,
recommendations targeting the general usefulness of computer
matching, and the technological capacity to use large data bases
to do quickly and easily the kinds of checks that used to take a
long time by hand. These and other factors have led to a climate
favoring the increased use of computer matching.

Among the specific factors, which are shown in table 2, we
found that the sources of a match were often legislative
requirements, particular recommendations from oversight groups
such as GAO or the President's Council on Integrity and
Efficiency, and internal agency interest. For example, the
Deficit Reduction Act of 1984 requires the states to develop an

Table 1: General Factors in Match Decisions

- Concern over waste, fraud, and abuse

- Technological developments

- Reports of successful matches

- Recommendations of key organizations such as the President's Council on Integrity and Efficiency or the General Accounting Office

Table 2: Factors in Specific Match Decisions

- Legislative mandates
- Individual recommendations from oversight groups
- Requests from other agencies
- Internal agency interest

income and eligibility verification system to permit the matching

of records on Aid to Families with Dependent Children, Medicaid,

food stamps, and other related programs.[3]

We found that for the legislatively mandated matches, few

other considerations entered into the decision of whether to do a

match. For the nonlegislatively mandated matches, we found two

types of consideration: operational, or technical, and support,

or justification.

As table 3 shows, the operational, or technical,

considerations dealt primarily with whether an agency had the

capacity to do the match--sufficient staff, access to necessary

data from other agencies, and the capacity to follow up on hits

and, particularly, to comply with applicable laws and

regulations.

The factors of support, or justification--that is, whether

an agency should do a match when the action was discretionary--

included the presence and magnitude of an existing problem

(often reported to us as a primary consideration) and the

consideration of costs and benefits (see table 4).[4]

Our review of the cost-benefit analyses and of the bases for

decisionmaking were useful as a foundation for developing our

guidelines. For example, we found relatively few instances in

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[3]U.S. General Accounting Office, Welfare Eligibility: Deficit
Reduction Act Income Verification Procedures, GAO/HRD-87-79FS
(Washington, D.C.: May 1987).

[4]Examples of problems are the failure of 18-year-old men to
register with the Selective Service System as required by law,
and overpayment of benefits resulting from unreported deaths.

Table 3: Operational, or Technical, Considerations

- Automated data processing resources
- Sufficient staff
- Cooperativeness of other agencies
- Data quality and security
- Capacity to follow up on hits
- Compliance with applicable legislation

Table 4: Support, or Justification, Considerations

- Presence and magnitude of a problem

- Relation of proposed match to other matches

- Costs and benefits

- Potential response to the match

which claims for savings achieved had been based on actual
overpayments recovered (when this had been the purpose of a
match). This led us to develop four criteria for reviewing cost-
benefit analyses of computer matches and the claims made for
them. These criteria, shown in table 5, complement the detailed
information in our guidelines related to technical adequacy. In
addition, our guidelines go into some detail on issues such as
how much time may be needed in order to completely record all the
actual recoveries and the value of reporting savings in terms of
actual dollars returned to the Treasury rather than projections
based on unvalidated assumptions about likely future success in
obtaining repayments.

OVERVIEW OF OUR GENERAL GUIDELINES

My last main point is on the feasibility of doing cost-
benefit analyses of computer matches. Our meetings with experts,
our review of the literature, our examination of the cost-benefit
analyses done by federal agencies, and our assessment of agency
decisionmaking led us to conclude that generally useful
guidelines could be developed. We were encouraged in this by the
consensus we found on certain elements of cost-benefit analysis
and by the individual agency examples of successful practice that
we saw.

In developing our guidelines for computer-matching cost-
benefit assessment, we took a broad perspective that we believe
is appropriate to the government, in which the costs and benefits
to all the entities that may be affected or involved in a match

Table 5: Criteria for Reviewing Computer-Match Analysis

- Completeness
- Technical adequacy
- Validation
- Full Reporting

are addressed rather than just the costs and benefits to the matching agency. We identified six such entities.

Turning first to the six entities potentially affected, we identified four at the agency level: the agency conducting the match, the agency that supplies data for the match, the Justice Department (if prosecution or recovery is involved), the clients of the match, and the source agencies. Two additional entities are the third parties who may have to supply verifying information and the general public.

As for the cost elements we believe should be considered, table 6 shows the potential costs of a computer match for each of the six entities. These include, in addition to the obvious costs of the salaries of the personnel involved, the potential costs to the matching agency of degraded client relationships and lower staff morale--if, for example, staff feel already overloaded with other work and verification is time consuming--and the costs to third parties who may need to provide evidence supporting a client's claims or the Justice Department's recovery efforts.

Table 7 shows the potential advantages of a computer match for each of the six entities. They include such benefits as recovery of overpayments, improved management, greater public confidence, identification of underpayments, and deterrence.

These lists of costs and benefits are extensive but not exhaustive. Not all the cost and benefit elements are relevant

Table 6: Primary Potential Costs of a Computer Match

Cost	Matching	Source	Justice	Client	Third party	General public
Salaries	x	x	x	x	x	
Fringe benefits	x	x	x		x	
Travel	x	x				
Materials	x	x	x	x	x	
Facilities	x	x	x		x	
Lower morale	x	x				
Reduced service	x	x				
Degraded client relationships	x					
Professional services				x		
Erroneous termination of benefits				x		
Invasion of privacy				x		x
Discouragement of legitimate clients						x

Table 7: Potential Benefits of a Computer Match

Benefit	Matching	Source	Justice	Client	Third party	General public
			Entity			
Avoid overpayments	x	x				
Recover overpayments	x	x				
Better law enforcement	x	x	x			
Increased deterrence	x	x	x			
Improved management	x	x				
Increased public confidence	x	x				
Increased program support	x	x				
Improved staff morale	x	x				
Improved service delivery				x		
Increased resources				x		
Less stigma				x		
Identification of underpayments				x		
Improved program efficiency						x

to or incurred by every match, and they differ for different match purposes. Judgment must be used in designing an analysis with regard to determining the specific cost and benefit elements that are to be included or excluded from the assessment. Factors that enter into this determination include such things as the purpose of the match, how the elements will be measured, and the effort and resources available or required to collect the data and perform the analysis.

In particular, it is clear from tables 6 and 7 that we believe it important to consider nonmonetary issues at least qualitatively and, under some circumstances, to undertake special studies and measurement development work. For instance, deterrence is a frequently touted benefit of computer matching that is difficult to establish quantitatively; indeed, we found few efforts by agencies to demonstrate retrospectively the existence and magnitude of changes that could support the claim that clients had been deterred from specific behavior. It is, however, possible to undertake special studies with adequate research designs and multiple measurement approaches. One such study might begin by determining if appropriately selected survey respondents are generally aware of the computer-matching activity, since a basic element of deterrence is the perception that the probability of being detected is high. In other words, for most of the more qualitative aspects of costs and benefits, we were able to identify, in addition to our more general guidelines, specific approaches to measurement that could be undertaken.

We also were able to identify many analytic techniques that can improve cost-benefit analyses without themselves adding to the cost of the match. For example, we found in our assessment that costs and benefits incurred in different years were rarely discounted or placed on a common fiscal year footing. This means that in some instances costs incurred in 1980, for example, were compared to benefits counted in, say, 1985 dollars without adjustments for inflation. Discounting techniques along with other approaches such as estimating actual dollars regained, rather than counting the maximum possible recovery of overpayments or payments to persons ineligible for them, are routine, well-established procedures that do not add appreciably to match costs.

What this means is that there is no inherent conflict between doing computer matching and accounting adequately for its costs and benefits. We believe this is important because of the real value of computer matching as a tool for ensuring the integrity of government programs.

SUMMARY

In summary, our in-depth examination of 17 computer matches and of the literature in this area did not reveal the existence of a well-developed or agreed-upon methodology for doing cost-benefit analyses of computer matches. This is not surprising, because in the decisions to initiate computer matches, other concerns have been more salient to agencies than the assessment of costs and benefits. Nonetheless, we found that it is indeed feasible to do sound cost-benefit analyses, and we have developed detailed

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guidelines for their execution. While these do not yet constitute a fully developed methodology, they are an important first step, and the use of the guidelines would permit the comprehensive, systematic, and technically adequate consideration of many costs and benefits relevant to different match purposes. This means that if agencies and the Congress want to know whether the benefits of computer matches outweigh their costs, it will now be a little bit easier to get that information.

Mr. Chairman, this concludes my statement. I will be happy to answer any questions the subcommittee may have.

APPENDIX I   ADVISORY PANEL

Panel member	Position at time of review
Clifford Graves	Chief Administrative Officer, San Diego County
David H. Greenberg	Professor of Economics, University of Maryland
Andrea C. Lange	Consultant, A. G. L. Associates
Thomas F. McBride	Associate Dean for Administration, Stanford Law School
Gary T. Marx	Professor of Sociology, Massachusetts Institute of Technology
Ronald L. Plesser	Partner, Blum, Nash and Railsback
Norma Rollins	Director, New York Civil Liberties Union Privacy Project
Robin White	Private consultant
Douglas A. Wolfe	Senior Research Associate, Urban Institute