

**American Economics
Group, Inc.**

Minnesota Sales and Use Tax Gap Project: Final Report

Prepared for

Department of Revenue, State of Minnesota

November 19, 2002

**American Economics Group, Inc.
2100 M Street, Suite 810
Washington, DC 20037
202-328-1545**

**Minnesota Sales and Use Tax Gap Project: Final Report
November 19, 2002**

The analysis and report were prepared by:

Eric Cook, Ph.D.

Charles W. de Seve, Ph.D.

Michael K. Evans, Ph.D.

(Alphabetically listed)

**American Economics Group, Inc.
2100 M Street, Suite 810
Washington, DC 20037
Tel: 202-328-1545
Fax: 202-462-0594
Virginia Office 703-941-1520
Email: cwdeseve@AmericanEconomics.com
WWW.AmericanEconomics.com**

TABLE OF CONTENTS

I. SUMMARY:	1
The Total Gap	1
The E-Commerce Gap.....	4
II. TRANSACTION AND AUDIT DATA: LEVEL I AND LEVEL II DATABASES	6
A. Measuring the Tax Gap using Microsimulation	6
B. Level II Database Construction: Audit Expectations	9
III. ESTIMATE OF TAX GAP USING INPUT-OUTPUT APPROACH	10
A. Data Used to Measure Economic Activity and The Sales Tax Base	10
B. Calculating Minnesota Intermediate Purchases.....	11
C. Calculating Minnesota Business Purchases of New Structures and Durable Equipment	12
D. Calculating Minnesota Personal Consumption Expenditures	12
E. Applying Minnesota Tax Law To Purchases	13
F. Sales and Use Tax Gap Estimates using the Input-Output Approach.....	14
IV. LEVEL III DATABASE CONSTRUCTION	17
A. Level III Database Approach	17
B. Level III Household Database	17
C. Level III Business Database.....	19
V. CHANGE IN TAX GAP OVER TIME USING REGRESSION ESTIMATES	20
A. Introduction.....	20
B. Method #1. Calculating Simple Ratios	21
C. Method #2. Examining E-Sales	23
D. Method #3. Regression Equation Estimates	24
E. Breakdown Between E-Sales and Other Tax Avoidance.....	26
F. Projections Through 2007	27
VI. TECHNICAL APPENDIX: CONSTRUCTING AND MAINTAINING THE MICROSIMULATION DATABASE	30
VII. COMPARISON WITH OTHER E-COMMERCE ESTIMATES: GAO AND FOX	44

I. SUMMARY:

For the final phase of the Minnesota Sales and Use Tax Gap Project, American Economics Group, Inc. (AEG) has prepared this report for the State of Minnesota's Department of Revenue (DOR). This document summarizes the findings of the tax gap study and the methodology used to analyze data and construct databases.

The study began with an exhaustive literature search¹ and extensive interviews of DOR staff, particularly those serving in audit and research functions. Their insight and mastery of often difficult and arcane features of sales and use tax law provided AEG with significant assistance. Their input during each phase of the work and advice during the entire project have made the results robust.

AEG measured Minnesota's tax gap in detail for the year 2000 and prepared a set of microsimulation databases to enable DOR staff to continue research into additional sales and use tax issues. This report, in conjunction with separate "Status Reports" for Phases I, II and III of the project, describes how AEG constructed three levels of databases using transaction files of existing taxpayers and information from DOR audits, combined with measures of overall economic activity in Minnesota. The final result is a comprehensive, weighted sample of all taxpayers who now file and all who do not file but should. Detail for each taxpayer (actual and potential) includes industry classification, size of business, amount of tax payment, amount of tax liability, audit expectations, use tax liability and more.

The following sections describe how multiple years of transaction records were woven into a year 2000 Level I database; how we applied audit information to these data to construct the Level II database of all business taxpayers who filed returns; and how Input-Output technique was used to estimate the gap and construct the Level III database. Additionally, this study describes the results of a regression approach to estimate the growth in the tax gap and project it through the year 2007. Finally, the technical appendix provides a detailed "how to" of the process used to create and update the databases.

THE TOTAL GAP

The sales and use tax gap² occurs when there is a difference between estimated revenue from expected "full-compliance" tax collection and the actual revenue collected. The gap consists of current taxpayers who underreport and those businesses and households that should file and remit tax, but do not. Built on actual DOR transaction files that make up the Level I database, the Level II database includes imputed additional taxes that current filers should pay, but do not. The Level III database (broken into two segments: businesses and households) includes the non-

¹ The results of the literature search include publications and reports from academic and government source, an extensive bibliography was provided to DOR in a separate document early in the project.

² The analysis separates sales and use tax components when possible. It is an artifact of the estimation process that figures relating to the total gap will be more robust than the split between sales and use components.

filers and imputes the amounts they owe the state. Final estimates of the gap flow directly from analysis of these databases.

Referring to figure S1, the total Minnesota Sales and Use Tax gap—the “full-compliance” gap—for year 2000 is an estimated \$451.1 million. Of this, current filers who underreported evaded paying an estimated \$288.1 million (Level II data), while non-filers evaded paying \$163.0 million in state-level sales and use tax (Level III data).

Of the total \$163.1 million for non-filers, sales tax accounts for 27.4% or \$44.7 million, while 72.6% or \$118.3 million relates to use tax. Households avoiding the use tax are responsible for \$74.7 million of the total non-filer gap, or 45.8%, while businesses account for \$88.3 million, about 54.2%.

The total gap from E-commerce is \$66.4 million and includes \$30.8 million related to retail, of which \$16.5 million is derived from households and \$14.3 million from businesses. The remaining E-commerce includes \$8.9 million in services, \$22.8 million in manufacturing and wholesaling, and \$3.9 million in all other activity. The \$53.7 million use tax portion of the E-commerce tax gap is 80.5% of the total E-commerce gap. The additional gap from catalog sales amounts to \$58.3 million.

PROJECTIONS

AEG projects that the 2000 Minnesota Sales and Use Tax gap of \$451.1 million will grow to \$693.1 million by 2007 (figure S2). The slight increase in the overall growth rate—from .75% to 8.1%—reflects several factors, including: E-commerce growth, the climb out of the recession and, absent additional compliance efforts, a small increasing propensity to avoid taxes. The E-commerce portion of the gap shows higher growth at a decreasing rate, falling from nearly 30% annually at present to 17.8% by 2007. The growth pattern follows an “S” curve rather than a simple compound growth curve, and

Figure S2

Projection of Total and E-Commerce Tax Gap 2000-2007 (millions of dollars)						
Year	E-Commerce Tax Gap	Percent Change	Other Gap Components	Percent Change	Total	Percent Change
2000	66.5		384.6		\$451.1	N/A
2001	86.2	29.7%	387.6	0.8%	\$473.8	5.0%
2002	110.8	28.4%	392.9	1.4%	\$503.7	6.3%
2003	133.9	20.8%	397.9	1.3%	\$531.8	5.6%
2004	161.4	20.6%	403.4	1.4%	\$564.9	6.2%
2005	192.3	19.1%	409.4	1.5%	\$601.7	6.5%
2006	228.7	18.9%	416.1	1.6%	\$644.8	7.2%
2007	269.4	17.8%	423.6	1.8%	\$693.1	7.5%

Figure S1 - Total Tax Gap by Components: 2000

Industry	Under-Reporting Sales Tax Gap (Level II)			Non-Filer Sales Tax Gap (Level III)			Total Non-Filers Sales and Use Tax Gap (Level II & III)
	Sales Tax Gap	Use Tax Gap	Total Level II Gap	Sales Tax Gap	Use Tax Gap	Total Level III Gap	
Agriculture	887,733	2,331,739	3,219,472	141,603	262,825	404,428	3,623,900
Mining	41,038	1,218,197	1,259,235	26,159	304,055	330,214	1,589,449
Construction	3,882,293	8,495,327	12,377,620	746,709	2,345,567	3,092,276	15,469,896
Manuf. & Wh'sale Trade	32,390,724	46,605,981	78,996,705	12,697,435	17,490,782	30,188,217	109,184,922
Transportation & Utilities	4,121,016	9,613,383	13,734,399	118,048	1,001,024	1,119,072	14,853,471
Retail Trade	57,780,212	39,595,849	97,376,061	19,510,193	10,558,268	30,068,461	127,444,522
FIRE	361,488	7,683,993	8,045,481	-	-	-	8,045,481
Services	35,391,020	37,664,287	73,055,306	11,477,384	11,611,496	23,088,880	96,144,186
subtotal Business	134,855,524	153,208,757	288,064,280	44,717,531	43,574,017	88,291,548	376,355,828
Households	-	-	-	-	74,754,756	74,754,756	74,754,756
Total Tax Gap	134,855,524	153,208,757	\$288,064,280	\$44,717,531	\$118,328,773	\$163,046,304	\$451,110,584

E-commerce Tax Gap (Included in total gap, above)

Manufacturing & Wholesale	N/A	N/A	N/A	7,985,400	14,821,457	22,806,858	22,806,858
Retail	N/A	N/A	N/A	1,133,087	13,170,260	14,303,348	14,303,348
Services	N/A	N/A	N/A	2,155,030	6,769,393	8,924,423	8,924,423
All Other	N/A	N/A	N/A	1,668,308	2,298,102	3,966,410	3,966,410
subtotal Business	N/A	N/A	N/A	12,941,825	37,059,213	50,001,038	50,001,038
Households	N/A	N/A	N/A	-	16,496,323	16,496,323	16,496,323
Total E-commerce Tax Gap	N/A	N/A	N/A	\$12,941,825	\$53,555,536	\$66,497,361	\$66,497,361

E-commerce Total Retail (business and households)	N/A	N/A	N/A	\$1,133,087	\$29,666,583	\$30,799,671	\$30,799,671
--	------------	------------	------------	--------------------	---------------------	---------------------	---------------------

Catalog Sales Tax Gap (Included in total gap, above)

Households	N/A	N/A	N/A	-	\$58,258,433	\$58,258,433	\$58,258,433
------------	-----	-----	-----	---	--------------	--------------	--------------

thus its rate varies. The E-commerce gap in 2007 is projected at \$269.4 million, 42.5% of the gap compared to 16.9% in 2000.

THE E-COMMERCE GAP

This study reports the E-commerce tax gap as significantly less than high estimates others have made using questionable data and a more inclusive set of taxed items. To arrive at our estimate, we employed full measures of economic activity within Minnesota, detailed survey data from the U.S. Census,³ we excluded items not taxed in Minnesota under the Sales and Use Tax (motor vehicles, clothing, etc.), and adjusted for the annual \$770 use exclusion given to individuals. (Details on the exclusion are given in the report.)

From its value of \$66.5 million in the year 2000, total sales and use tax loss from E-commerce sales is expected to increase to \$269.4 million by 2007. Note that this is significantly less than estimates suggested by other researchers. The Fox study⁴, for example, suggested a 2001 combined state and local revenue loss from E-commerce of \$323.7 million in Minnesota. Fox then forecasts the gap rising to be \$897.3 million in 2006 and \$1,331.9 million in 2010. AEG believes these numbers are not supported by the level of business and consumer activity in Minnesota. It is common knowledge that many estimates of E-commerce and internet growth have been proven high, and apparently many studies have resorted to what appears to be excessive projections developed by Forrester.⁵ In addition the U.S. General Accounting Office in 2000 studied the sales tax loss to E-commerce, and AEG's estimates are within the range of its figures for Minnesota. (The appendix contains a more complete review of the Fox

³ Based upon U.S. Census' surveys. See <http://www.census.gov/eos/www/papers/estatstext.pdf> for a description of the surveys and for statistics on the findings. "E-commerce data were collected in four separate Census Bureau surveys. These surveys use different measures of economic activity such as value of shipments for manufacturing, sales for wholesale and retail trade, and revenues for service industries. Consequently, measures of total economic and E-commerce activity differ in concept and definition among these sectors, and should be added together with caution. The Census Bureau's E-commerce measures report the value of goods and services sold online whether over open networks such as the Internet, or over proprietary networks running systems such as Electronic Data Interchange (EDI)."

⁴ See "State and Local Tax Revenue Losses from E-Commerce: Updated Estimates," Donald Bruce and William F. Fox, University of Tennessee, Knoxville, October 2001, published on the Web at <http://www.statestudies.org/ecomreport.pdf>.

⁵ Forrester Research (<http://www.forrester.com/home>) has widely publicized its summary estimates of E-commerce. The underlying data and any analysis are available only to clients, so it is difficult to make full evaluations. Figures often cited to support extremely high internet sales apparently used \$87.5 billion in national consumer E-sales for 2002 suggested by Forrester, who revised them down to \$72.1 billion recently. Also, the 2007 figure was revised down from \$276.6 to \$217.8 billion. Forrester also estimated consumers spent \$51.3 billion last year. They anticipated a 40% gain this year, whereas the Census figures show a 22% gain. It does not take many years of growth for differences of this magnitude to result in wildly different projections.