

# Multi-tax Incidence Analysis in a Microsimulation Environment

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# Tax incidence in a nutshell





# Overview

- What is tax incidence?
- People (households) pay taxes not businesses
- Tax incidence analysis attempts to show who ultimately bears the burden of taxes
- The Minnesota approach
  - Step 1: Determine the initial imposition of the tax
  - Step 2: Determine the effects of tax shifting
  - Step 3: Determine the incidence on state households



# Household database construction

- The household database should combine micro-data obtained from the state, the IRS (IMF/IRTF) as well as from other sources.
- Taxes are borne by households, so the tax return data must be configured into households (tuno and ntuf)
- A statistical match of US Census Bureau's *American Community Survey* (ACS) with the tax data provides additional economic and demographic information.
- Consumer expenditures from the US Bureau of Labor Statistics *Consumer Expenditure Survey* may then be imputed to households



## **Step 1: Determine the initial imposition of each tax**

- Individual income tax (microsimulation)
- Sales, use and excise taxes
- Corporate income and franchise taxes (microsimulation)
- Property taxes (both residential and commercial)



# Individual income tax

## Tax Summary

Project Description:  
 Base Policy Description: FTA Baseline Policy.pol  
 Alternative Policy Description: FTA Alt Policy Tax Reform.pol  
 Unit of Analysis: Returns  
 Filing Status Coverage: 0  
 Tax Year: 2018  
 Classifier: AGI  
 Economic Forecast: FTA Fall 2017 Forecast.ies  
 Effective Tax Rate: Tax Classifier  
 Resident Coverage: ALL

AGI Dollars		Number of Returns		Taxable Returns			AGI			Taxable Income		
		Sample (Units)	Aggregate (Units)	Base Plan (Thousands)	Alternative (Thousands)	Change (Thousands)	Base Plan (Millions)	Alternative (Millions)	Change (Millions)	Base Plan (Millions)	Alternative (Millions)	Change (Millions)
-infinity	25000	241,291	253,710	142,523.69	58,661.54	-83,862.14	2,261.16	2,261.16	0.00	1,144.06	1,528.10	384.04
25001	50000	132,612	139,438	134,233.89	126,215.38	-8,018.51	5,068.41	5,068.41	0.00	3,428.89	3,936.84	507.95
50001	75000	77,506	81,495	79,721.45	79,277.73	-443.72	5,013.60	5,013.60	0.00	3,509.36	3,860.99	351.63
75001	100000	66,565	69,991	68,960.70	68,848.19	-112.51	6,156.21	6,156.21	0.00	4,310.18	4,636.25	326.08
100001	125000	40,726	42,822	42,406.86	42,345.88	-60.99	4,701.61	4,701.61	0.00	3,278.51	3,484.30	205.80
125001	150000	17,426	18,323	18,138.92	18,125.25	-13.67	2,499.40	2,499.40	0.00	1,713.16	1,805.54	92.38
150001	175000	10,466	11,005	10,910.06	10,899.54	-10.51	1,778.22	1,778.22	0.00	1,230.97	1,285.82	54.85
175001	200000	6,470	6,803	6,740.98	6,735.72	-5.26	1,268.44	1,268.44	0.00	876.32	911.08	34.77
200001	250000	7,111	7,477	7,407.61	7,406.56	-1.05	1,658.30	1,658.30	0.00	1,136.25	1,176.00	39.75
250001	500000	7,909	8,316	8,240.38	8,239.32	-1.05	2,743.11	2,743.11	0.00	1,829.70	1,880.74	51.04
500001	1000000	2,167	2,279	2,260.66	2,261.71	1.05	1,547.96	1,547.96	0.00	1,006.96	1,027.97	21.01
1000001	infinity	929	977	961.04	964.20	3.15	2,624.50	2,624.50	0.00	1,730.56	1,757.61	27.05
<b>Totals</b>		611,178.00	642,635.70	522,506.23	429,981.03	-92,525.21	37,320.91	37,320.91	0.00	25,194.91	27,291.24	2,096.33

AGI Dollars		Tax			Distribution			Effective Tax Rate		
		Base Plan (Millions)	Alternative (Millions)	Change (Millions)	Base Plan (%)	Alternative (%)	Change (%)	Base Plan (%)	Alternative (%)	Change (%)
-infinity	25000	26.62	12.81	-13.81	2.62%	1.25%	-1.37%	1.18%	0.57%	-0.61%
25001	50000	103.61	91.67	-11.94	10.19%	8.96%	-1.23%	2.04%	1.81%	-0.24%
50001	75000	118.35	116.09	-2.26	11.64%	11.35%	-0.29%	2.36%	2.32%	-0.05%
75001	100000	157.05	158.40	1.35	15.45%	15.48%	0.04%	2.55%	2.57%	0.02%
100001	125000	121.79	123.16	1.37	11.98%	12.04%	0.06%	2.59%	2.62%	0.03%
125001	150000	64.96	66.74	1.77	6.39%	6.52%	0.13%	2.60%	2.67%	0.07%
150001	175000	49.60	51.76	2.17	4.88%	5.06%	0.18%	2.79%	2.91%	0.12%
175001	200000	37.36	39.38	2.02	3.67%	3.85%	0.17%	2.95%	3.10%	0.16%
200001	250000	51.44	54.63	3.19	5.06%	5.34%	0.28%	3.10%	3.29%	0.19%
250001	500000	94.31	101.46	7.15	9.28%	9.92%	0.64%	3.44%	3.70%	0.26%
500001	1000000	61.71	66.84	5.13	6.07%	6.53%	0.46%	3.99%	4.32%	0.33%
1000001	infinity	129.79	140.06	10.27	12.77%	13.69%	0.92%	4.95%	5.34%	0.39%
<b>Totals</b>		1,016.59	1,022.99	6.40	100.00%	100.00%	-0.00%	2.72%	2.74%	0.02%

# Sales, use and excise taxes – intermediate business purchases

File Edit Simulation Forecast Help				
Baseline Alternative Reports				
Intermediate Investment Consumer				
Base Year Gross Base				
Products	Purchasers	Intermediate Business Goods and Services	Private industries	Government
Intermediate Business Goods and Services		256,323.57812	226,129.35938	30,194.21289
Private industries		250,082.90625	220,645.96875	29,436.92969
Agriculture forestry fishing and hunting		15,840.83496	15,777.18945	63.64540
Mining		8,985.66406	8,327.34473	658.31921
Utilities		4,774.13428	4,114.35547	659.77899
Construction		3,707.44922	1,940.53882	1,766.91052
Nondurable goods manufacture		47,968.96094	41,971.30859	5,997.65430
Durable goods manufacture		34,643.39062	31,238.53320	3,404.85913
Wholesale trade		2,119.03564	2,119.03564	0.00000
Retail trade		1.30031	1.30031	0.00000
Transportation and warehousing		6,771.71094	5,773.82959	997.88116
Information		8,868.17188	7,073.27686	1,794.89465
Finance insurance real estate rental and leasing		45,938.95703	43,305.82031	2,633.13770
Professional and business services		58,959.92188	49,523.01953	9,436.90332
Educational services health care and social assistance		1,607.61133	1,003.10309	604.50830
Arts entertainment recreation accomodation and food service		5,856.58203	5,010.58594	845.99597
Other services except government		4,039.15625	3,466.71680	572.43939
Government		1,814.09497	1,538.93237	275.16254
421.) Postal service		1,298.87085	1,234.79382	64.07708
422.) Federal electric utilities		0.00000	0.00000	0.00000
423.) Other Federal Government enterprises		81.08071	81.08071	0.00000

# Sales, use and excise taxes – business investment purchases

File Edit Simulation Forecast Help					
Baseline Alternative Reports					
Intermediate Investment Consumer					
Base Year Gross Base					
Products	Purchasers	Investment Industries	Agriculture forestry fishing and hunting	Mining	Utilities
Investment		40,125.60156	3,080.77466	1,285.46521	1,737.68848
Mining and drilling		720.80627	0.00000	670.77966	50.02662
1.) Uranium radium and vanadium ore mining		50.02662	0.00000	0.00000	50.02662
2.) Drilling oil and gas wells		5.56890	0.00000	5.56890	0.00000
3.) Support activities for oil and gas operations		103.30662	0.00000	103.30662	0.00000
4.) Support activities for other mining		561.90417	0.00000	561.90417	0.00000
Construction		11,646.19727	283.55276	40.37019	692.14526
Manufacturing machinery and equipment		19,297.81250	2,629.08325	434.97012	736.94604
Transportation		0.00000	0.00000	0.00000	0.00000
170.) Air transportation		0.00000	0.00000	0.00000	0.00000
171.) Rail transportation		0.00000	0.00000	0.00000	0.00000
172.) Water transportation		0.00000	0.00000	0.00000	0.00000
173.) Truck transportation		0.00000	0.00000	0.00000	0.00000
Other		8,460.79102	168.13870	139.34537	258.57059
174.) Software publishers		1,695.14697	21.01316	15.85374	100.75441
175.) Telecommunications		107.28584	0.00000	0.00000	0.00000
176.) Offices of real estate agents and brokers		111.46157	0.00000	0.00000	0.00000
177.) Engineering services		1,299.85840	120.88466	34.27882	46.88427
178.) Custom computer programming services		4,871.66113	20.85409	86.31409	105.85287
179.) Computer systems design services		305.37161	4.78226	2.73651	3.91137
180.) Noncomparable imports		70.00393	0.60454	0.16222	1.16766





## Other taxes

- Corporate income and franchise taxes
- Property taxes on both households and businesses



## Step 2: Determine effects of tax shifting -- households

Incidence of taxes on households:


- The individual income tax is paid by individual taxpayers
- Taxes on purchases by consumers are borne by consumers of taxed items
- Property tax on homeowners is borne by the homeowner



## **Step 2: Determine the effects of tax shifting -- businesses**

Allocating business taxes:


- Most taxes on business property, business purchases, and corporate income are partially shifted to consumers and workers
- The amount of tax shifting varies by tax and by business sector
- To shift a tax, the business legally liable to pay the tax must alter its economic behavior



## **Step 2: Determine the effects of tax shifting – businesses (continued)**

Allocating business taxes (other than business intermediate purchases):

- The average sales tax rate on all capital goods across all 50 states and DC (national average) is determined, borne by capital in the form of lower profits.
- If the national average rates by industry sector exceeds the national average rate on all capital goods, borne by consumers in the form of higher prices (national sector differential).




## **Step 2: Determine the effects of tax shifting – businesses (continued)**

Allocating business taxes (other than business intermediate purchases):

- The extent to which the average “state” sales tax exceeds the national average tax rate for a particular sector is termed the “state sector differential.”
- If this “state sector differential” is associated with firms competing in “local markets” then that differential will result in higher prices for consumers (price-makers).
- If it is associated with firms competing in “national markets” it is borne by labor because the firms are price-takers.





## **Step 2: Determine the effects of tax shifting – businesses (continued)**

Allocating business taxes (other than business intermediate purchases) to nonresidents:

- Exported burden on capital -- most moderate sized states 90 percent
- Exported burden on consumers -- borne by visitors in form of higher prices
- Exported burden on labor -- assumed zero percent shifted to nonresidents



## **Step 3: Determine the incidence on specific state households**

- Burden on consumers -- taxes shifted forward to consumers in the form of higher prices based upon their share of total consumer expenditures
- Burden on corporate capital -- allocated to households in proportion to taxable dividends and capital gains
- Burden on labor -- allocated based upon each household's share of earned income

## Step 3: Final household incidence

Table 1 - Distributed Individual, Corporate, and Sales by Deciles									
Number of Households	Expanded Income	Individual Income Tax	Percent Distribution	Corporate Income Tax	Percent Distribution	Sales Tax	Percent Distribution	Total Tax	Percent Distribution
262,528	3,227,614	42,810,426	5.0%	17,471,195	12.5%	603,083,373	33.3%	663,364,994	23.7%
87,505	3,227,616	58,895,961	6.9%	14,231,937	10.2%	239,035,991	13.2%	312,163,889	11.1%
60,304	3,227,638	71,903,647	8.4%	14,400,034	10.3%	191,102,972	10.6%	277,406,652	9.9%
45,702	3,227,617	81,532,701	9.5%	14,876,623	10.6%	164,302,337	9.1%	260,711,662	9.3%
38,254	3,227,671	88,151,233	10.3%	15,803,738	11.3%	150,321,608	8.3%	254,276,579	9.1%
32,769	3,227,643	90,009,252	10.5%	16,033,833	11.4%	135,982,434	7.5%	242,025,520	8.6%
25,722	3,227,661	94,247,703	11.0%	15,433,815	11.0%	120,733,672	6.7%	230,415,189	8.2%
18,407	3,227,766	104,285,976	12.2%	14,774,102	10.5%	96,323,319	5.3%	215,383,397	7.7%
10,088	3,228,155	106,296,886	12.4%	11,411,171	8.1%	70,175,181	3.9%	187,883,238	6.7%
2,348	3,226,739	115,759,037	13.6%	5,696,639	4.1%	37,785,899	2.1%	159,241,575	5.7%
583,627	32,276,120	853,892,821	100.0%	140,133,088	100.0%	1,808,846,786	100.0%	2,802,872,695	100.0%



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