Elasticity and Stability

Washington State Tax Structure Study

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Elasticity and Stability

- In economic good times and bad times, tax revenues need to be stable and predictable to meet government needs.

- In order for taxpayers to efficiently plan for the future, their tax liability needs to be stable and predictable.

Elasticity Questions

- *Do our tax revenues keep up with income?*
  - *Over the long run?*
  - *During economic expansion?*
  - *During economic downturns*?

Elasticity Questions

- *Have changes in our tax system such as exemptions, deductions, and base broadening over the past ten years changed our elasticity?*

- *Are our tax revenues stable?*

What is Elasticity and Why Measure It?

- Elasticity is a measure of how a tax system keeps up with changes in the economy. It shows how tax revenues compare with the economy in good times, bad times and over the long run.

- To measure elasticity, tax base and tax rates are usually held constant. This way, the measure isolates the direct impact of the economy on tax revenues.

- There are many different ways to measure elasticity. Our measure of elasticity is equal to the percentage change in constant base and constant rate taxes over the percentage change in personal income.

- The way we measure elasticity analzes the sensitivity of our underlying tax structure to changes in the economy.

What is Elasticity and Why Measure It?

- An elasticity equal to 1 or close to 1 indicates that the tax revenues move with the economy.
- An elasticity greater than 1 indicates that tax revenues change more than the economy. This is called an *elastic* tax system.
- An elasticity less than 1 indicates that tax revenues do not change as much as the economy. This is called an *inelastic* tax system.

Long Run Elasticity

- Most economists agree that in the long run demand for government services increases as income increases, just as demand for most other goods and services increases as income increases.

- If changes in tax revenues do not keep up with income, revenues may not keep up with the demand for government services.

Short Run Elasticity

- A tax system that is sensitive to economic downturns results in less tax revenue at a time when government expenditures may need to increase to provide services (e.g. higher unemployment may mean higher service demands).

- On the other hand, a tax system that is sensitive to changes in the economy may result in revenue surpluses during good economic times.

Short Run Elasticity

- A volatile system is not necessarily a problem if surplus revenue is saved for economic downturns.

- Predictability is another desired attribute. If the elasticity is not predictable, it is harder for governments to plan for the downturns.

Washington State Long Run Elasticity 1975-2001

(Constant Rate and Constant Base)

All Excise Taxes	**0.93**
Sales Tax	0.93
Use Tax	0.89
B&O Tax	0.96
Utility Tax	0.86
Property Tax	1.10

Source: Department of Revenue

Washington State Long Run Elasticity

- Washington State long run elasticity is less than 1. Tax revenues did not keep up with income over the long run.
- Sales tax, use tax, and utility tax have the lowest elasticities.
- One reason that overall growth in sales and use tax revenues has not kept up with the economy is the leakage from the sales tax base caused by the shift from goods to services and remote sales.

Washington State Long Run Elasticity

- The property tax elasticity is greater than 1; however, this is deceiving. The property tax elasticity is based on assessed value. Because of property tax limitations, elections for special levies, etc., it is not a good indicator in the long run for tax collections. It is only an indicator of capacity.

- There is some concern that high stock options have inflated income estimates. However, when elasticity is measured without software wages, the elasticity estimates do not change much.

Washington State Long Run Elasticity

Have exemptions, deductions, and changes in our tax base changed our elasticity over the past ten years ?

Washington State Long Run Elasticity

- The impact of Referendum 47 (changes the 106 Property Tax Limit) and Referendum 49 (eliminates the Motor Vehicle Excise Tax) has been to decrease long run elasticity by about .05. So our long run elasticity estimate would be closer to .88 than .93.

- Throughout the analysis, the base year for elasticity estimates is 1975. The mix of taxes changed from 1975 to 2001. Would our elasticity change if we based it on today's mix of taxes? We compared the total elasticity weighted by tax type for 1975 and 2001. The change in tax mix did not change the total elasticity significantly.

Elasticity for Different Time Periods

	1975-85	1985-01	1978 (Boom)	1982 (Bust)
All Taxes	**0.90**	**0.96**	**1.37**	**0.10**
Sales Tax	0.88	0.98	1.41	0.15
Use Tax	0.86	0.92	1.88	-0.77
B&O Tax	0.97	0.95	1.16	0.00
Utility Tax	1.15	0.60	0.91	1.58
Property Tax	1.19	1.02	N.A.	N.A.

Source: Department of Revenue

Elasticity for Different Time Periods

- In 1978, a boom year, elasticity was higher than 1.
- In 1982, a bust year, elasticity was less than 1.
- One year property tax elasticities are not shown because they lag in assessed values.

Elasticity for Different Time Periods

- Negative use tax elasticity comes from the fact that nominal personal income is almost always increasing (and did in fact increase slightly in 1982). The use tax collections decreased in 1982.

- The reason the sales tax elasticity is not negative is because of high inflation in 1982. The high inflation caused the sales tax base to increase slightly.

Elasticity for Different Time Periods

- Utility elasticity after 1985 is low because the electricity and natural gas prices are regulated and therefore do not fluctuate with income. Changes in utility prices tend to be flatter than income.

- The high elasticity prior to 1985 probably reflects the spike in electricity costs from the early 1980s.

Forecast Elasticities for Selected Taxes

	2002	2003
Sales Tax	-0.10	1.10
Use Tax	-1.20	1.00
B&O Tax	-0.60	1.00

Source: Department of Revenue

Forecast Elasticities for Selected Taxes

- Both the sales and use tax revenues are forecast to be negative. Unlike 1982, inflation is not high, so revenues are decreasing as nominal income is increasing slightly.

- Elasticities for 2003 look good; however, the numbers are somewhat deceiving. Since the base of the percentage change (2002) is a depressed year, the growth in revenues is high. This is not necessarily an indicator of good elasticities in future years.

Comparison with Other States

- The following slides examine two studies:
  - Holcombe and Sobel, Growth and Variability of State Tax Revenue
  - Donald Boyd, Fiscal Issues and Risks at the Start of a New Century

Comparison with Other States

- When looking at the results, it is important to understand that these studies have different measures of elasticity than the measures we have been discussing.

- Holcombe and Sobel are interested in a somewhat different question, the variability of the actual tax revenues, both from economic and political activity. They are interested in the political responsiveness of tax systems. Our measures of elasticity only measure the sensitivity of the underlying tax structure to changes in the economy.

Comparison with Other States

- The Holcombe and Sobel measures are very different from our constant rate, constant base elasticities because they are not constant rate, constant base.

- Keep in mind in the following slides, that the Holcombe and Sobel results include all of our tax rate and tax base changes between 1972 and 1993, a time period in which there were considerable changes.

Comparison with Other States

- According to Holcombe and Sobel, Washington's long term elasticity seems to be higher compared to other states.
- In their study, Holcombe and Sobel show that Washington State has a high long term elasticity compared to other states. Washington ranks either 16th or 18th (depending on specification).
- This means that our total tax system, including the political responsiveness is above average. It does not necessarily mean that the long term sensitivity of our underlying tax structure is above average.

Comparison with Other States

- Other studies show that Washington's cyclical variation seems to be higher than average.
- According to Holcombe and Sobel, Washington State has a high cyclical variation (from 1972 to 1993) compared to other states. Washington's ranking for total tax cyclical variation, including policy changes, is from 2nd highest to 16th highest (depending on specification).
- Donald Boyd in Fiscal Issues and Risks at the Start of a New Century shows Washington as having a rank of 16th most volatile for cyclical sales tax elasticity.

Comparison with Other States

- The Holcombe and Sobel study ranked the following taxes nationwide for the highest cyclical variations:

# 1	Corporate income tax
# 2	Sales tax with food exempted
# 3	A tie between personal income tax and retail sales tax with food

- The Boyd study shows sales tax to be somewhat less volatile than income tax.

Conclusions about Elasticity

- Over the long run, Washington State's tax base is not keeping up with the economy.

- According to Holcombe and Sobel, Washington State's long run elasticity is better than average. However, keep in mind that the Holcombe and Sobel elasticity measure includes changes in rates and base.

Conclusions about Elasticity

- Sales, use, and utility taxes have the lowest long run elasticities.
- In the short run, our cyclical elasticity is volatile.
- During economic expansion the tax base is expanding faster than the economy.

Conclusions about Elasticity

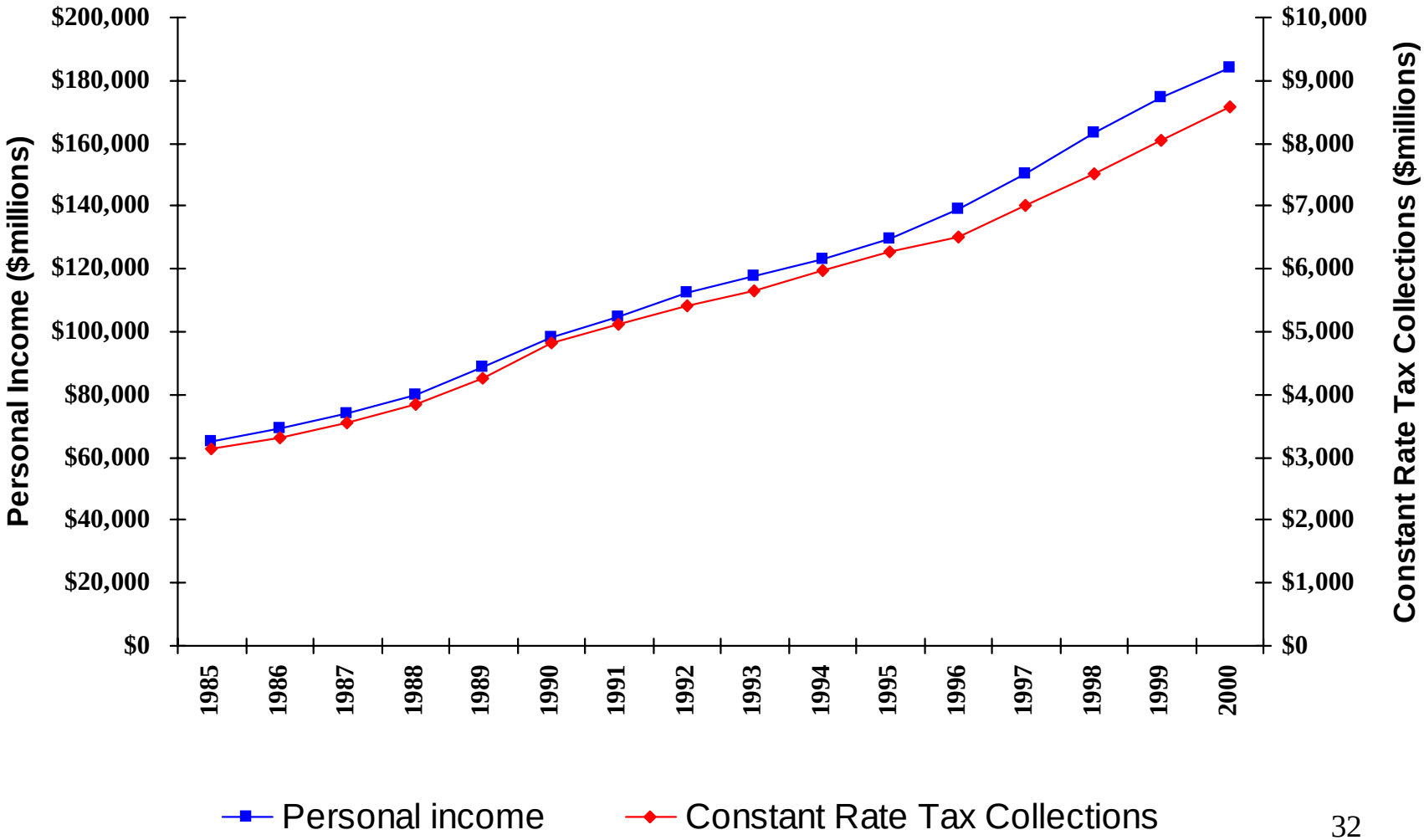
- During economic downturns the tax base is contracting more than the economy.
- However, the economy is becoming somewhat more stable as employment and revenues are shifting from a manufacturing based economy to a services based economy. Business cycles are farther apart and less dramatic. This means that short term elasticities are perhaps not as important as they once were.

Stability

Stability Questions

- *Are Washington state's tax revenues predictable?*
- *Is the tax system stable? If not, why not?*

Constant Rate, Constant Base Tax Revenues Compared to Personal Income

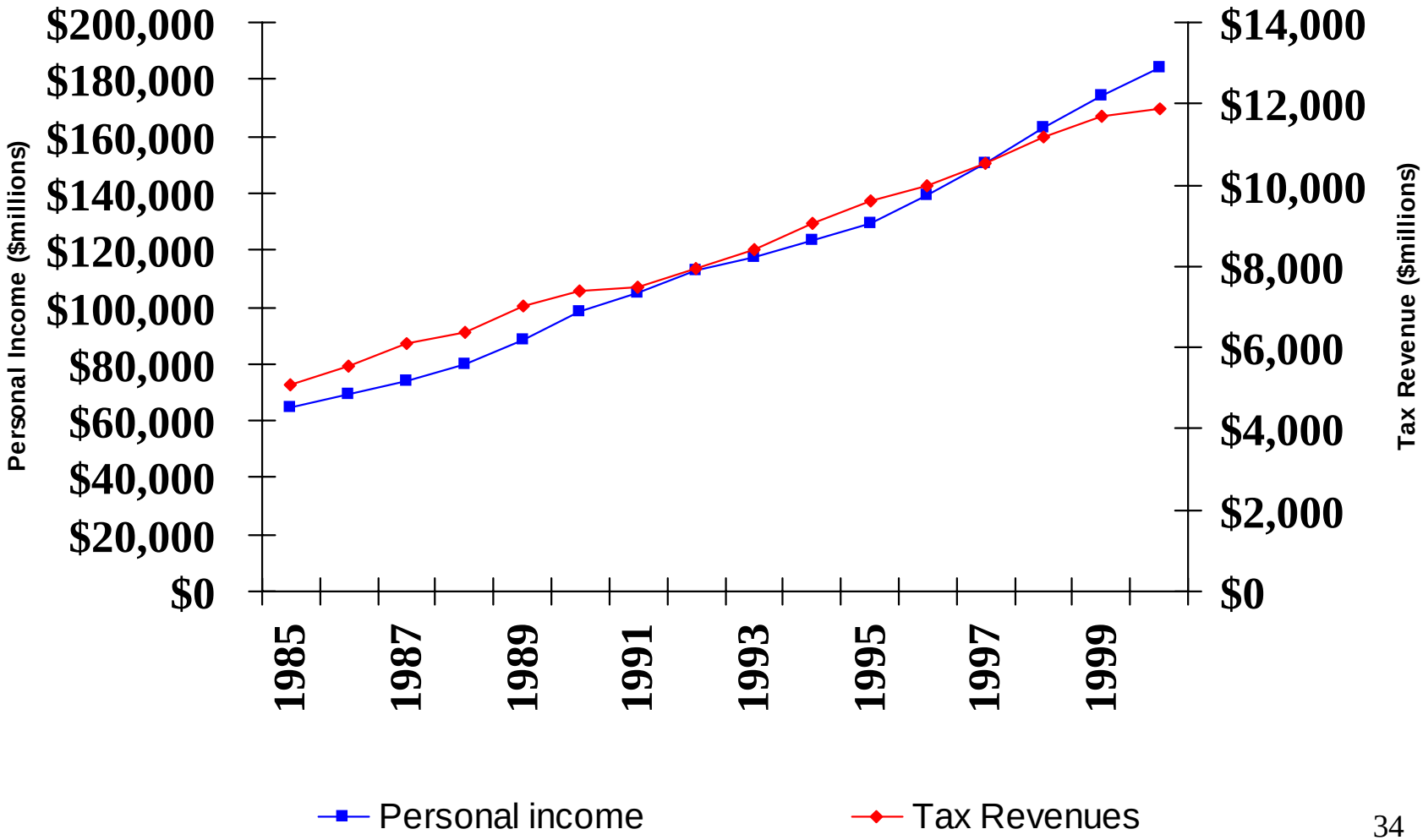


Constant Rate, Constant Base Tax Revenues Compared to Personal Income

- In 1995 the rate in constant rate, constant base tax revenues diverges sharply from the growth in personal income.

- In later years, not only does the growth in tax revenues never catch up, but the growth rate continues to diverge, widening the gap.

Tax Revenues Compared to Personal Income



Tax Revenues Compared to Personal Income

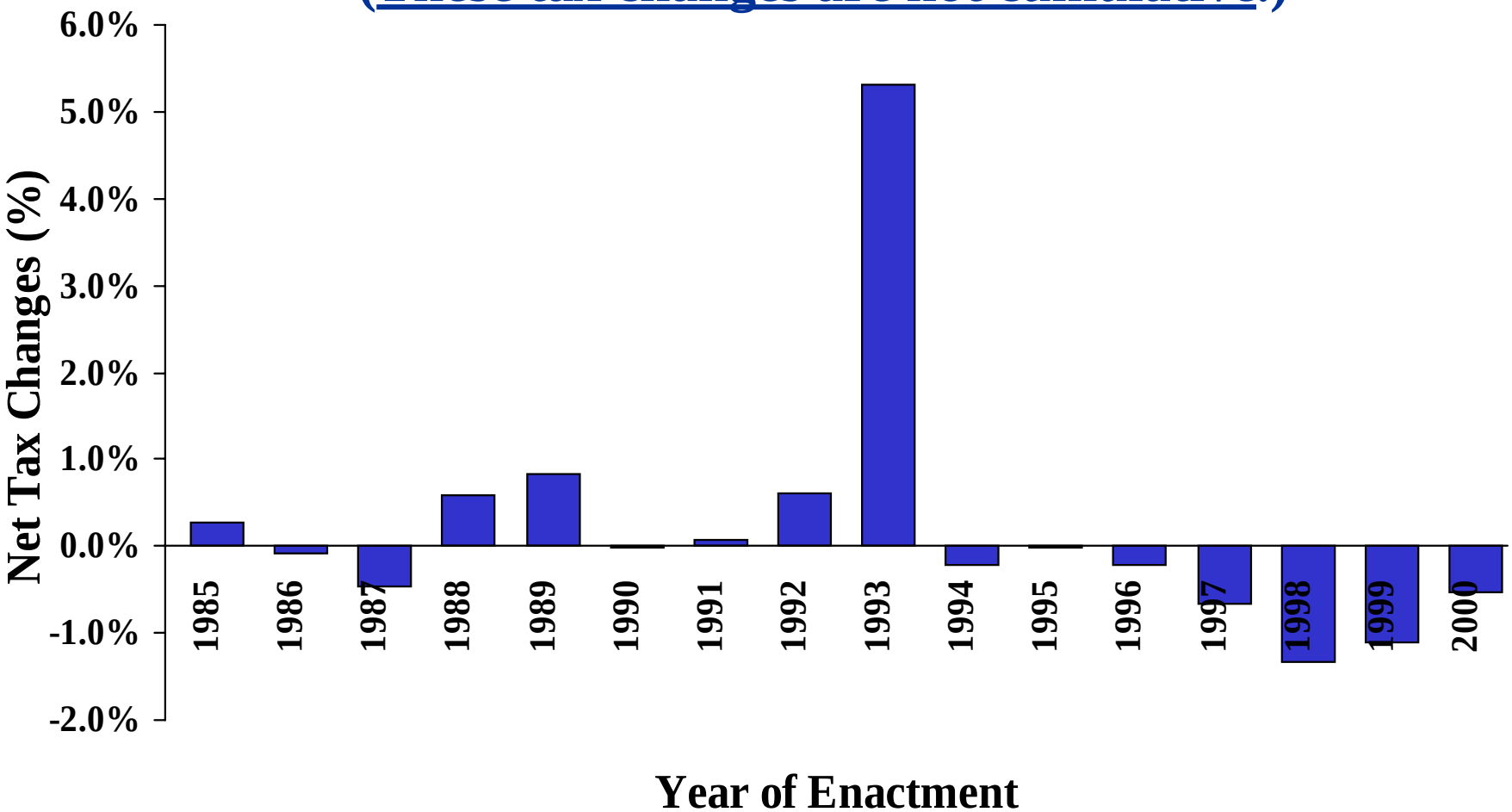
- Actual tax revenues are less stable compared to personal income. Changes in the tax rates and base have caused more instability.

- Tax revenue growth rates are sometimes faster, sometimes slower than growth in personal income.

- In 1995, growth in actual revenues starts diverging from growth in personal income, even more so than the constant rate, constant base revenues diverge.

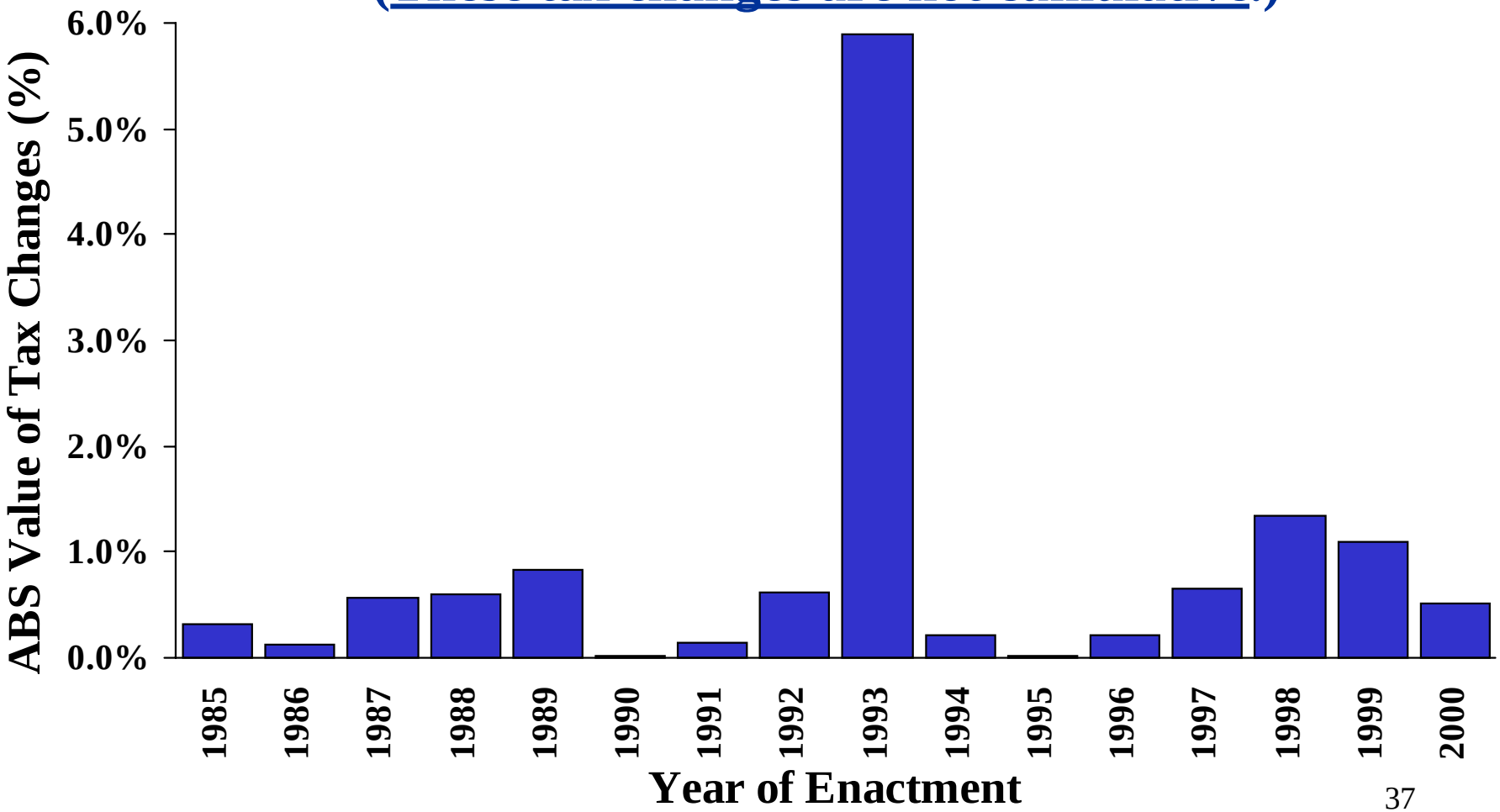
Tax Changes Each Year from The Previous Year from the Taxpayer's Point of View

(These tax changes are not cumulative.)



Absolute Value of Tax Changes Each Year from The Previous Year from the Taxpayer's Point of View

(These tax changes are not cumulative.)



Tax Changes

- Note that although the percentage of tax changes may seem small, some tax changes can fall primarily on one industry or small group of taxpayers.

- Also note, that not all changes negatively affect predictability. Some tax changes are simplifications for the taxpayer.

Elasticity and Stability

Questions?