

McCULLOUGH RESEARCH

ROBERT F. MCCULLOUGH, JR.
PRINCIPAL

MEMORANDUM

Date: October 18, 2015

To: Commissioner Fish

CC: Mayor Hales
Commissioner Fritz
Commissioner Novick
Commissioner Saltzman

From: Robert McCullough

Subject: Demolition Tax Incidence

On Wednesday, October 14th, you asked whether I had an estimate of who would pay the proposed \$25,000 tax on demolitions. It was a good question to ask and I should have known the answer. I did remark that this was part of any good introductory class – of which I have taught a few – and that there is a straightforward answer.

That straightforward answer is that a majority of the tax is paid by the home buyer – approximately 92% or \$23,000. The remainder is paid by the developer.

Now for the typical economist's caveats. As one wag once put it, "so many caveats, so few hands." I'll try to address the imprecision of the estimate with only the hands I have on hand.

François Quesnay, an eighteenth century French economist, introduced the concept of tax incidence. The presentation below is illustrated by tools developed by Alfred Marshall, a nineteenth century British economist. These calculations have been around for many, many years.

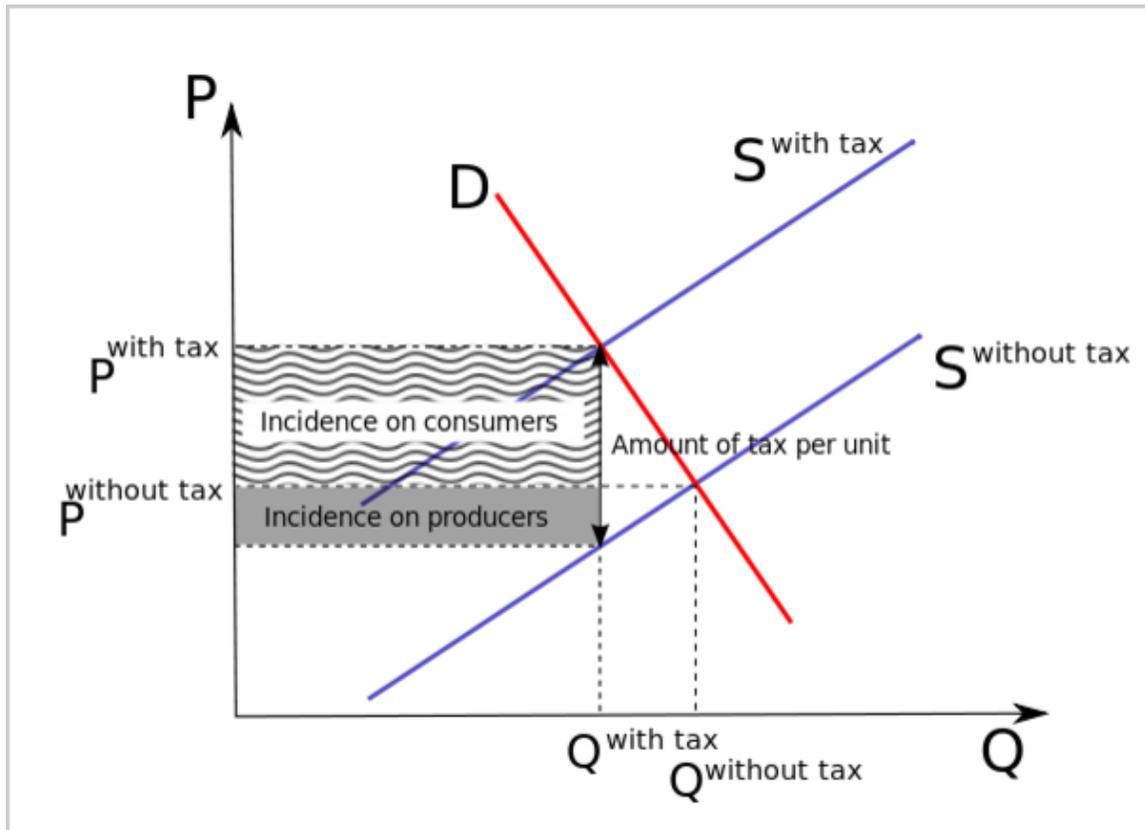
Our demolition tax, if it is not easily evaded, will raise the supply curve for new housing by \$25,000 for each new single family home. The higher supply curve reflects the addition of a new tax to the already existing cost of the lot, the demolition, a multitude of existing taxes, and, finally, construction.

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The standard textbook has the following illustration:



Zillow, a web site that publishes housing price data, estimates the average as \$335,000. Trulia, a similar site, indicates that the average listing price is \$454,000. The proposed tax is likely to be a hefty increment – between 6% to 9% of a home’s cost.

Who pays the tax depends on the slope of the lines. Figuring out every point on the graph above is a laborious task. Luckily, the graph can be reduced to a relatively simple formula:

E_s = Price Elasticity of Supply

E_d = Price Elasticity of Demand

Fraction of tax borne by home buyer = $E_s / (E_d + E_s)$

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Elasticity is economist speak for how responsive someone is to a change in price. If you have just been offered your dream job in Portland, Oregon, your demand is inelastic. You are going to buy a house regardless of price.

On the other hand, as a builder, if you will build more and more houses if the price goes up, your supply elasticity is elastic.

A monograph published in 2005 estimates the price elasticity of supply in Portland as 7.5.¹ The authors expressed surprise that the supply of housing in Portland was so responsive to price, given the existence of the urban growth boundary. I shared their surprise until I realized that the urban growth boundary has a large break in its fence – Clark County, Washington.

The elasticity of demand is harder. I could not readily find an estimate for Portland, so I fell back on the dean of the housing elasticity literature, Professor Eric A. Hanushek.²

Placing these estimates into the formula above gives the fraction paid by the home buyer:

$$\text{Fraction of tax borne by home buyer} = 7.5 / (7.5 - .642) = 92\%$$

The result matches our perceptions well. Housing demand is strong and buyers are willing to pay rapidly increasing prices – in economist’s terminology the “demand is inelastic”. Builders are highly price responsive – their “supply is elastic”. It is a seller’s market and the sellers can pass along increased prices.

The numbers used here are honest, but not precise. This is common in real world policy research. I have a motivated intern who would love to update both studies if you would like the precise “best” answer. Send up a flare (or whatever signal you prefer) and I’ll donate his time to the project.

The key issue is whether the proposed tax can be evaded. If it can be, the tax will have no effect on behavior or prices. Given the exemption for two or more homes, we can expect few to pay the tax and there will be few impacts. Absent the multiple home loophole, the best way to evade the tax will be to use empty lots and dilapidated homes. This is probably beneficial, but home buyers will still bear the brunt of the cost.

¹ Metropolitan-Specific Estimates of the Price Elasticity of Supply of Housing, and their Sources, Richard K. Green, Stephen Malpezzi and Stephen K. Mayo, January 7, 2005.

² What Is the Price Elasticity of Housing Demand?, Eric A. Hanushek and John M. Quigley, The Review of Economics and Statistics, Volume 62, Issue 3 (Aug., 1980), 449-454.