Cannabis Forecasting in Washington State

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Executive Director

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Nashville, TN
Washington’s Cannabis Timeline

- **I-502 Passes**: November 2012
- **LCB adopts implementation rules**: October 2013
- **First retail store opens**: July 2014
- **Cannabis taxes amended**: July 2015
- **Medical, recreational sales merged**: July 2016

**Timeline Events**

- **2012**: I-502 Passes
- **2013**: LCB adopts implementation rules
- **2014**: First retail store opens
- **2015**: Cannabis taxes amended
- **2016**: Medical, recreational sales merged

**Additional Events**

- **LCB accepts license applications**: November 2013
- **Oregon legal recreational sales start**: October 2015
Cannabis revenue forecasting challenges

- No historic data
- Changing market conditions:
  - Initial lack of supply
  - Growth in number of retail stores
  - Decline in price
  - Change in mix of cannabis products available
  - Changing structure of taxes (7/2015)
  - Legalization in Oregon (10/2015)
  - Combining recreational, medical sales (7/2016)
  - Loss of detailed data after October 2017

Source: ERFC, LCB
Initial small number of licensed growers led to lack of supply

- Only 3 producers (growers) licensed in June 2014
- Only 12 producers licensed in July 2014
- Many retail stores closed for days or weeks after initial opening due to lack of supply
- For 18 retail stores open in July 2014, monthly sales ranged from $6,013 to $356,786
The number of retail stores has increased from 18 to just over 400.

Source: WA Liquor and Cannabis Board, data through May 2019
The price of cannabis has fallen dramatically

Pre-tax Retail Price of Recreational Cannabis

Source: WA LCB, ERFC; data through October 2017
Edibles and extracts have become a growing share of retail sales

“Usable” cannabis as percent retail sales

Source: WA LCB, ERFC; data through Sept. 2017
Cannabis taxes 7/2014 to 7/2015

- I-502 called for three tier tax system with taxes paid by cannabis businesses
  - 25% on sales by producers to processors or retailers
  - 25% tax on sales by processors to retailers
  - 25% tax on sales by retailers to consumers

- Cannabis businesses subject to Federal income taxes
  - Cannot treat expenses for illegal activities as deductible business expense (IRC sec. 280E)
  - Result was that cannabis taxes treated as income for federal tax purposes
Cannabis taxes 7/2015 on

- Three tier tax system eliminated
- Single 37% sales tax imposed on retail sales only
- Retail cannabis sales continue to be subject to state and local sales taxes
- Cannabis businesses continue to be subject to the state’s gross receipts tax
- Because tax imposed on consumer, cannabis tax no longer “income” for Federal tax purposes
Sipic and Wells, “Oregon Cannabis Impacts on WA Cannabis Revenues”

- Examined total retail cannabis sales in WA before and after October 1, 2015 when legal sales began in Oregon
  - Difference in weekly sales before and after Oregon legalization for WA stores within 30 miles of Oregon compared to all other WA stores

- For 20 retail stores within 30 miles of Oregon, average weekly sales declined by $78,344 after October 1, 2015
Oregon legalization may have affected Clark County but statewide sales continued to grow.

Prior to legal retail sales in Oregon, Clark County accounted for 12.8% of total sales by quantity.

In December, Clark County accounted for 7.8% of total sales by quantity.

Cannabis Forecasting
August 7, 2019

Source: WA LCB; data through December 2015

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Step 1: how big is the WA cannabis market?

- Estimate of “use days” from National Survey on Drug Use and Health: in 2010 & 2011, average of 556,000 WA residents used cannabis in past month
- Little data on how much cannabis consumed during typical use day
- Potential for under-reporting in self-reported survey data
- Need to adjust 2010 & 2011 data for rising consumption trends

**Conclusion:** WA cannabis consumption in 2013 between 135 & 225 metric tons; median estimate of 175 metric tons
Step 2: recreational pricing and market share

- Estimating retail price range by varying grower selling price, market share of useable vs. infused products, processor and retailer markups, etc.
- Potential for grower production costs to decline over time
- Comparing potential retail prices to black market, medical marijuana prices to estimate recreational market share

**Simulation results:**

- Median retail price = $13.69 per gram, median total tax per gram = $5.23, base case recreational market share = 13%
Initial assumptions

- Total WA cannabis consumption = 160 metric tons (slightly less than Kilmer median estimate)
- Initial legal recreational market share = 1%, increasing 1% per month through June 2016
  - Small initial number of growers, retailers
  - Competition from medical, illegal markets
- Discount legal market size for local restrictions on cannabis businesses
- 70% sales from combined grower/processor licensees (25% excise tax collected from grower/processor and from retailer)
Given uncertainty around retail store openings, we did not forecast any revenue for 2013-15 until Sept. 2014.

Legislation passed after the June 2015 forecast increased cannabis revenue by $6.9 M.

Source: WA LCB, ERFC
June 2015 forecast includes impact of merging medical, recreational markets.

Actual collections for 2015-17 were 25% above June 2015 forecast.

Cannabis revenue forecasts for 2015-17 biennium

- Source: WA LCB, ERFC
June 2015 forecast includes impact of merging medical, recreational markets.

Actual collections for 2017-19 were 8.2% above June 2015 forecast.

Cannabis revenue forecasts for 2017-19 biennium

Forecast dates

Source: WA LCB, ERFC
Starting point – analysis commissioned by Liquor and Cannabis Board

- **Base case scenario assumptions:**
  - Total annual WA cannabis sales of 120 – 220 metric tons
  - Recreational retail market share = 13%
  - Medical marijuana share = 15%
  - Black market and home grow share = 72%
  - Production price = $3/gram (pre-tax)
  - Retail price = $10/gram (pre-tax)

- Adjusted market share to account for share of population with reasonable access to retail stores

Source: BOTEC Analysis Corporation, “How much revenue could the cannabis tax generate under different scenarios?,” June 2013

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Early modifications to forecasting process

- Given rapid growth in sales and revenue, we made following changes to forecast assumptions:
  - Ø Increased total annual consumption from 160 to 175 metric tons
  - Ø Increased share of state population with access to retail stores as more retail stores opened
  - Ø Increased the rate of growth of the legal market share
Intermediate point – price and quantity trend analysis

- With several months of data, used trends in per gram price and in quantity sold to forecast price and quantity.
- Since July 2015, forecast revenue = forecast price \times forecast quantity \times 0.37
- With loss of tracking/data system, forced to extrapolate price and quantity from historic data combined with total sales:
  - New tracking system expected to go live late this year.
Cannabis forecast “model”

- **Now:** trend analysis
  - Assume growth in quantity sold will trend towards population growth rate
    - Requires black market share of sales reaches steady state
  - Assume growth in price will trend towards inflation rate
    - Requires price changes due to greater competition, productivity reach steady state

- **Future:** develop price and quantity models, estimate seasonal factors

Source: ERFC
Cannabis revenue growth is expected to moderate

Retail Cannabis Collections

Source: ERFC June 2019 forecast; historical data through June 2019

WASHINGTON STATE ECONOMIC AND REVENUE FORECAST COUNCIL
## Distribution of cannabis revenues, 2015-17 biennium

<table>
<thead>
<tr>
<th></th>
<th>I-502 formula</th>
<th>Enacted budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCB – administration</td>
<td>$10.0</td>
<td>$15.2</td>
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<tr>
<td>Substance abuse, mental</td>
<td>$72.5</td>
<td>$58.0</td>
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<tr>
<td>health, community health</td>
<td></td>
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<tr>
<td>centers</td>
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<tr>
<td>Cannabis education</td>
<td>$36.3</td>
<td>$15.0</td>
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<td>UW/WSU research</td>
<td>$3.6</td>
<td>$0.8</td>
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<tr>
<td>Basic Health Plan/Medicaid</td>
<td>$181.3</td>
<td>$178.7</td>
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<td>Dropout prevention</td>
<td>$1.1</td>
<td>$0.8</td>
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<tr>
<td>Other (surveys, research, etc.)</td>
<td>$1.4</td>
<td>$1.7</td>
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<tr>
<td><strong>General Fund</strong></td>
<td><strong>$67.8</strong></td>
<td><strong>$103.8</strong></td>
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</table>

Source: ERFC June 2015 forecast, ESSB 6052 operating budget, I-502
## Distribution of cannabis revenues, 2017-19 biennium

<table>
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<tr>
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</tr>
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<tbody>
<tr>
<td>LCB – administration</td>
<td>$10.0</td>
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<td>Substance abuse, mental health, community health centers</td>
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<td>Cannabis education</td>
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<td>UW/WSU research</td>
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<td>Basic Health Plan/Medicaid</td>
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<td>Dropout prevention</td>
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<td>Other (surveys, research, etc.)</td>
<td>$1.4</td>
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<tr>
<td><strong>General Fund</strong></td>
<td><strong>$137.9</strong></td>
<td><strong>$247.3</strong></td>
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Cannabis excise tax and license fee estimates

<table>
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<th>$Millions</th>
<th>Cannabis Forecast</th>
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<tbody>
<tr>
<td></td>
<td>2017-19</td>
<td>2019-21</td>
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<tr>
<td>GF-S share of excise tax and license fees</td>
<td>$249</td>
<td>$267</td>
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<td>Non-GF</td>
<td>$503</td>
<td>$534</td>
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<td>Total</td>
<td>$752</td>
<td>$801</td>
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Total change since March forecast:

- 2017-19: $3.1M
- 2019-21: $2.3M
- 2021-23: $1.2M

*Detail may not add to total due to rounding; ERFC June 2019 forecast*
Cannabis taxes raise similar levels of revenue to other WA “sin taxes” (2017-19 biennium)

• Spirits taxes: $561.7 million
  • WA has the highest spirits taxes among the 50 states

• Cigarette and tobacco products taxes: $840.1 million
  • WA has the 9th highest cigarette excise tax among 50 states

Sources: Tax Foundation, SalesTaxHandbook.com
General Fund-State plus Cannabis Revenue, 2017-19 biennium

“All other” includes revenue sources such as public utility, liquor, cigarette taxes

$ billions

- Retail Sales (state); $21.3
- Property Tax (state); $5.1
- Business & Occupations; $8.6
- Real Estate Excise; $2.2
- Cannabis; $0.8
- All other; $6.6

Source: ERFC June 2019 forecast
Thank you!