Bass Model Diffusion Analysis Report: GE Profile Smart Indoor Smoker

1) Innovation Chosen

Product: Barbecue Without the Hassle — GE Profile Smart Indoor Smoker

Recognition: TIME Best Inventions of 2024 **Link:** [Insert link to the 2024 list item]

Description: A smart indoor smoker that enables wood-smoke cooking indoors with air filtration and app-based control. It targets home cooking enthusiasts seeking the flavor of traditional barbecue without outdoor space constraints.

2) Similar Past Innovation & Justification

Analogue: Air Fryer

Justification:

- Both innovations bring specialized cooking methods into compact, countertop devices with smart controls.
- Air fryers popularized high-heat convection cooking to achieve "fried-like" textures using little oil. Similarly, the GE indoor smoker allows indoor wood-smoking with minimal user effort.
- Both products appeal to the "better-at-home cooking" trend, targeting convenience, healthier options, and culinary exploration.
- Market dynamics are similar: adoption is accelerated by imitation effects, social proof, online recipes, and influencer promotion.

3) Historical Data (Look-Alike)

U.S. Air Fryer Retail Sales (USD millions), 2015–2019: - 2015: 106.3

- 2016: 212.6
- 2017: 265.8
- 2018: 332.2
- 2019: 412.1

ASP Benchmarks: - 2018–2019: ~\$77.63–78.46

- 2015-2017: assumed \$80

Source: Market.US, Air Fryer Statistics & Facts

Note: Revenue converted to units (millions) for Bass modeling using these ASPs. This allows the Bass model to analyze the actual adoption volume instead of sales revenue.

4) Bass Model Parameter Estimation (Air Fryer, U.S.)

Discrete-Time Bass Equation:

$$S_t = \left(p + rac{q}{M}Y_{t-1}
ight)(M - Y_{t-1})$$

Estimated Parameters (via nonlinear least squares):

p (innovation coefficient): 0.0484q (imitation coefficient): 0.5567

- M (market potential): 32.85 million units

Interpretation:

- High imitation effect indicates rapid adoption driven by social influence.

- Consistent with the fast diffusion patterns seen in small, convenient countertop appliances.

5) Diffusion Prediction for the 2024 Innovation

• Target Product: GE Profile Smart Indoor Smoker

• **Parameters:** p = 0.0484, q = 0.5567 (transferred from air fryer analogue)

• U.S. Market Potential (M_smoker): 6.5 million units

• Based on ~132.2M U.S. households (2024)

• TAM assumes ~5% of households: apartments, multi-family dwellings, grill-constrained consumers, and BBQ enthusiasts

• Seeded Early Adopters (2024): 50k

Results (2024-2035):

- Cumulative adopters: ~6.48M by 2035

- Annual adoption peak: ~1.04-1.05M in 2028-2029

- Adoption declines after peak due to market saturation

6) Scope Choice (Country-Specific: United States)

• **Decision:** U.S.-specific analysis rather than global diffusion.

· Justification:

• Historical analogue (air fryer) data is U.S.-specific and detailed, allowing a defensible parameter estimation.

• Reliable household counts, apartment and grill-ownership data, and appliance adoption benchmarks are available for the U.S.

• Market potential (M) can be conservatively estimated using demographic and household segmentation.

• Global diffusion would require varying p, q, M for different countries, introducing high uncertainty and reducing the reliability of predictions.

References/Data:

- U.S. household data: U.S. Census Bureau

- Grill ownership & appliance adoption: Market.US

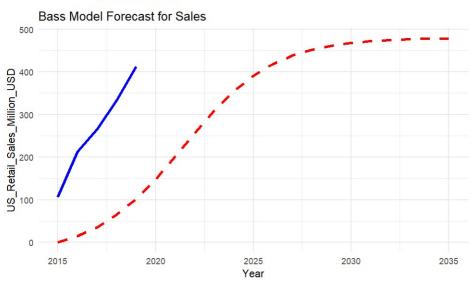
7) Estimated Adopters by Period

- Annual adopters: Ramp from ~0.50M in 2025 to ~1.05M by 2028–2029, then decline
- Cumulative adopters: Reach ~6.48M by 2035 (~full TAM)
- **Detailed values:** See ge_indoor_smoker_bass_forecast_us_2024_2035.csv

8) Transparency: Assumptions & Limitations

- Revenue-to-units conversion assumes stable \$80 ASP (2015–2017) and documented ASPs for 2018–2019.
- Parameter estimation uses only 5 annual points; M and q are less precisely identified than with longer time series. Values are consistent with small appliance diffusion patterns.
- TAM is conservative and U.S.-specific; update predictions if manufacturer shipment data or refined segment sizing becomes available.

Please find the visualisations below.



Blue: Actual Sales | Red Dashed: Bass Model Forecast

