



Realizing the Promise of Dynamic Pricing Through Responsible Innovation

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Abstract – Dynamic pricing, or the practice of altering rates in response to demand, is becoming more common in businesses such as air travel, hotels, and entertainment. While the economic idea of balancing supply and demand through pricing is sound, dynamic pricing implementations have sparked customer skepticism. The lack of transparency in demand metrics and price setting fuels the perception that the systems are manipulative ploys to overcharge clients. Though dynamic pricing tries to maximize revenue when demand spikes, customers believe the slant is exclusively upward during peak hours. Case studies on short-lived dynamic pricing trials for fast food and movie theaters, which sparked threats of boycotts, illustrate the consumer backlash. Thus, the application of dynamic pricing merits oversight given the asymmetries between producer and consumer interests. Opportunities exist to create fairness standards around transparency, monitoring to prevent predatory pricing levels devoid of real demand swings, and communicating the rationale behind dynamic pricing models. Dynamic pricing is expected to increase as digital transactions become more common and data-analytics capabilities develop. Even while inventory revenue management benefits from the practice, it should be regulated to provide acceptable limits and consumer protections against misuse. Demand-based pricing can mitigate the current climate of mistrust and prevent a race to the bottom for profit maximization by ensuring dynamic pricing lives up to its free market principles. Before adoption of this new pricing strategy may proceed unhindered, norms and governance surrounding it are required to strike a balance between producer income aims and customer perceptions of fairness.

Keywords: Demand-based pricing, Variable pricing, Price optimization, Differential pricing, Yield management, Personalized pricing, Price elasticity, Surge pricing.

1. INTRODUCTION

1.1 Define Dynamic Pricing and Provide Examples of Its Use in Various Industries (Airlines, Hotels, Rideshares, Entertainment, Etc.)

Dynamic pricing, also known as demand-based pricing, is the practice of adjusting prices in real-time based on current market demand. Rather than keeping prices static over a period of time, companies leveraging dynamic pricing alter rates – often using automated algorithms – to capitalize on supply-and-demand fluctuations in the marketplace. The airline industry pioneered modern applications of the dynamic pricing model back in the 1980s. Carriers realized they could increase revenues by adjusting ticket prices based on travel dates, occupancy levels on flights, and days remaining before departure rather than using just the traditional classes of service. Now dynamic pricing has spread as computing capabilities evolved to integrate complex data inputs spanning from inventory availability to competitor actions and even social media traction plus identified consumer willingness-to-pay levels across segmented customer profiles.



A number of factors drive price variability under dynamic pricing, foremost being the current balance of supply versus market demand. During periods of low capacity and high desire for a product, dynamic pricing will ratchet prices upwards to take advantage of the imbalance. Conversely, lagging interest leads to price drops to incentivize customers. Some other key inputs include competitor pricing maneuvers, inventory expiration or spoilage concerns, marketing campaign success, social media trends, and consumer emotion or patience thresholds that evolve over shorter time horizons. Cloud computing has enabled far more variables to be assessed in real-time to now make dynamic pricing feasible across hospitality, entertainment, electric vehicle charging, e-commerce and other industries.

Early examples beyond airfares include hotel nightly room rates that increase as occupancy levels tighten across in-demand seasons. Rideshare services like Uber and Lyft incorporate complex machine learning algorithms to apply dynamic pricing down to the city intersection level based on local rider demand patterns. Flexible pricing allows asset utilization - whether an airline seat or rideshare vehicle seat - to be optimized for revenue yield management across far more transitory conditions than fixed pricing schedules allow. Streaming media services have also tapped dynamic pricing for must-see live events beyond their traditional flat monthly rates. The potential relevance spans the spectrum - from sports, concerts and conferences to political debates or product launches depending on user demand signals.

Dynamic pricing relies on leveraging technology to analyze data variables that reflect market willingness to pay sentiment on an ongoing basis. Machine learning models assess multitudinous signals from first-party data like sales patterns and third-party data on local event attendance or social media trends that might spark interest spikes. Natural language processing parses through customer inquiries and public sentiment to anticipate demand shifts. As implementations evolve, they often tap psychological techniques around emotional responses and framing biases that induce customers to accept certain price points or payment options over others depending on contextual factors that computer models can discern. But the uncertainty around the drivers and extent consumers understand dynamic pricing contributes questions around fairness and transparency issues.

1.2 Explain the Basic Economic Principle Behind It (Aligning Prices to Match Supply and Demand)

At its core, dynamic pricing builds upon the fundamental economic theory of supply and demand - that is, when demand is high and supply is limited, prices rise. Conversely when supply outpaces demand, prices fall to stimulate more sales. Dynamic pricing utilizes technology to assess supply-demand balance in real-time across granular market segments that warrant unique pricing suited to their distinct equilibrium at a moment in time. Rather than rely on fixed, periodic pricing changes, it taps analysis of fluctuating market conditions through ongoing data flows to align pricing to the intersection of supply availability and consumer desire.

Mainstream economics has long centered on the premise that free market forces influence the natural movement of prices based on the balance of what producers can supply and consumers will demand. Known as the "invisible hand" since the days of iconic economist Adam Smith in 1776, pricing reaches an equilibrium between how much vendors are willing/capable to sell and the interest buyers have to purchase at a given price level. Too high of price without ample desire stunts sales. Too low a price without scarcity extracts less value from willing buyers happy to pay more. Striking the optimal balance depends on the goods, customers, seasons, geographies, substitute products, singular microeconomic factors that constantly shift.

Dynamic pricing uses technology to assess these factors nimbly in a 24/7 marketplace across much more precise market segments. Rather than rely on fixed weekly or monthly pricing strategy reviews tied to general

forecasts, it taps real-time data to align pricing on an hourly or daily basis relevant to much more distinct conditions. This allows organizations to better keep prices attuned to supply and demand dynamics surfacing locally or during irregular events in faster-moving environments vs. legacy batch-and-queue processing.

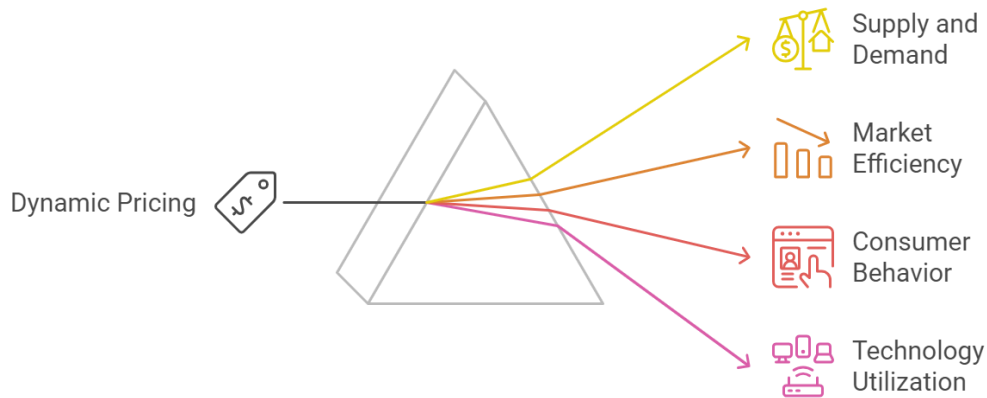


Fig -1: Dynamic Pricing

Hotels demonstrate the variability where dynamic pricing delivers over \$5 billion in incremental annual revenue for the industry according to research firm Kalibri Labs. Room rates can change daily driven by local occupancy rates, citywide conventions impacting inventory scramble, proximate sporting events or concerts sparking interest spikes. Airlines manage yield per seat using dynamic pricing accounting for booking levels, regional resilience to higher fares, departure dates and competitive flights. Rideshare platforms assess neighborhood demand patterns and driver availability to price routes accounting for conditions by city quadrant and even directionality. Streaming media has tapped dynamic pricing for live events when consumer interest swells.

The dynamism promotes market efficiency by better connecting supply availability at a precise moment to the demand willingness and ability to purchase at prevailing price points. Data science crafts algorithms correlating history to probable realities. Machine learning models process signals on buying behaviors, event interests, and market force indicators to constantly recalibrate pricing relevance. Rather than leave latent demand untapped or inventory spoiled, dynamic pricing unlocks greater market matching. With cloud computing able to crunch immense data volumes in near real-time, the customization once unrealistic at scale becomes feasible. And as consumer comfort with variable pricing rises across transportation, entertainment, electric vehicle charging and other categories, the business lead looks positioned to expand.

2. THE POTENTIAL BENEFITS

2.1 Can Help Companies Optimize Revenue and Inventory

One of the foremost arguments in favor of dynamic pricing is the potential upside for companies to optimize their revenue streams and inventory utilization through demand-based pricing mechanisms. By tapping data analytics to align prices more nimbly to market conditions, the dynamic approach stands to unlock incremental revenue that remains latent across both peak and valley demand cycles. Rather than leaving money on the table during high-interest spikes or having perishable capacity go under the potential benefits through demand troughs, automated and accelerated pricing modulation better monetizes inventory availability.



The airline sector validates these financial benefits, serving as the pioneer of contemporary dynamic pricing beginning in the 1980s. By leveraging computerized inventory management and yield optimization systems, carriers discovered they could boost per flight profits by introducing variable ticket classes and more frequent fare changes responsive to booking loads, departure dates, competitive offerings and other demand drivers. This enabled finer calibration of prices and seat allotments to balance accessibility and revenue maximization across economy, premium economy and business/first classes. The net revenue gains realized through dynamic pricing completed the transition away from uniform pricing.

What emerged was a marketplace able to tap live inventory data alongside probabilistic modeling of booking patterns, cancellations, no-shows and traveler preference elasticity. This allowed demand-based pricing changes every 90 seconds if warranted, rather than relying on monthly fare adjustment meetings. The benefits cascaded across better seat utilization, incremental revenue unlocked during peak periods, reduced spoiled inventory from empty seats, and competitive matching of rival flight options. Industries adopting dynamic pricing realize similar advantages around tighter supply-demand alignments amplified by technology.

Hotels can adjust room rates on a daily level, rather than longer fixed seasons, to capitalize on surging local demand from concerts, conferences, festivals and other events. Rideshare platforms apply machine learning to assess neighborhood-level rider demand every few minutes across cities to price routes accounting for imbalance. Sports teams, theaters and cinemas tap dynamic pricing to better monetize high-appeal dates aligned to marquee matchups, new releases or exclusive engagements. Market efficiency improves by tapping technology to unlock greater price-demand matching.

For companies weighing dynamic pricing, they must balance revenue optimization goals against long-term brand perception concerns rooted in customer fairness sensitivities. But examined primarily through a financial lens, the benefits surface from several angles:

- Pricing Precision - Fine-tune prices aligned to granular demand shifts across narrower customer segments, locations and shorter time intervals
- Latent Demand Monetization - Capture greater customer willingness-to-pay during peak demand periods
- Perishable Inventory Revenue - Reduce unsold capacity whether empty seats, hotel rooms or other expiring product
- Operational Agility - Nimble respond in near real-time to competitions, market events and early sales indicators
- Customer Segmentation - Tactically open accessibility for price-sensitive customers during weaker demand through targeted promotions
- Balanced Accessibility - Efficiently fill more capacity aligned to customer willingness to pay at personalized price points

For leading practitioners, dynamic pricing drives measurable revenue lift, whether 5-10% for airlines or 8-12% in hospitality, demonstrating the financial upside. Additional inventory and capacity utilization benefits further justify dynamic pricing exploration for asset-intensive businesses battling perishability concerns. While critics argue dynamic pricing fuels price gouging and inequitable access when solely viewing customer fairness

impacts, examining holistic outcomes suggests benefits justify ongoing adoption with transparency guardrails.

2.2 Reflects Free Market Principles of Prices Being Set by Supply and Demand Forces

Dynamic pricing proponents highlight its roots in free market principles – that prices organically reach equilibrium based on the balance of supply and demand. By using technology to assess supply availability and market demand in faster-moving environments, dynamic pricing sets out to strike price points reflecting the real-time interplay of these core economic forces. Rather than constraints of periodic pricing reviews, it seeks to capture free market dynamics across more transient conditions relevant to highly customized audiences.

The concept of dynamic pricing mirrors free market theory popularized by iconic economist Adam Smith in the late 18th century. The metaphor of an "invisible hand" that guides pricing to a natural equilibrium based on what suppliers are willing to provide and buyers will purchase at various price points. However, companies historically struggled to assess transient shifts for customized products across their demand changes, market events, inventory availabilities, expiration risks and competitive landscape alterations.

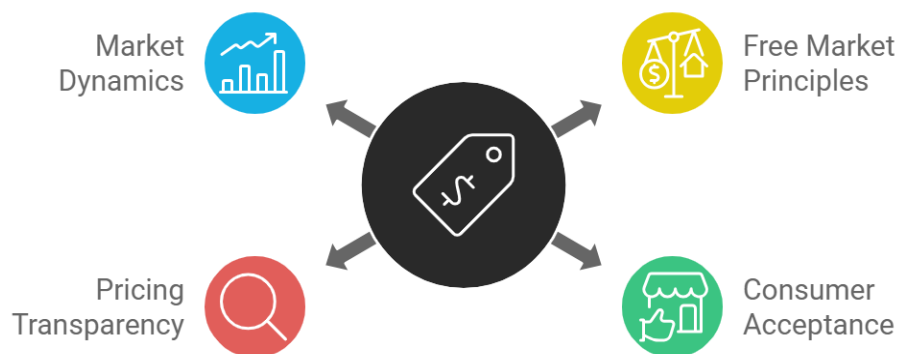


Fig -2: Free Market Principles

Pricing was often cost-based or reliant on imprecise demand forecasting nested in drawn-out planning processes ill-equipped for how contemporary consumers engage the marketplace. Dynamic pricing changes that status quo by tapping exponential leaps in data collection, storage, accessibility and analytical precision powered by cloud computing. It enables pricing determination mechanisms to better keep pace with free market dynamics that classical economics supports rather than using batch-updated pricing disconnected from freely evolving demand sentiments and supply availability.

Uber demonstrates dynamic pricing striving to capture free market conditions by pegging ride fares to driver supply ratios when rider demand surges in certain neighborhoods of a city. Consumers face a transparent trade-off of higher prices during peak times balanced against ready access to rides as more drivers flock there sensing financial incentive. As newly tapped driver supply rushes in, wait times moderate and pricing retreats – an equilibrium emerges reflecting the transient supply-demand balance.

Hotel nightly rates rise, and fall based on local occupancy levels as an indicator of demand elasticity. When rooms fill during popular seasons or special events, pricing aligns to the market willingness to pay. Airlines overbook flights knowing a percentage of passengers won't show up to better ensure full capacity aligned to free market principles. Sports teams might risk empty seats during losing seasons by keeping fixed ticket



prices that prove mismatched to actual demand. Dynamic pricing across these categories aims to let market dynamics determine optimal pricing.

Research suggests consumers increasingly accept demand-based pricing as a reflection of free market fairness when transparency guards against unwarranted manipulation. Companies like Uber provide riders estimated fare ranges allowing choices aligned to willingness to pay. Amazon introduces surge pricing on some high-demand products during peak seasons while highlighting when pricing stays locked despite demand swings. Solutions enhancing consumer visibility tied to dynamic pricing changes driven by market variables and technology-fueled agility better resonate relative to suspicion over opaque practices.

While critics counter that dynamic pricing enables price gouging absent sufficient regulation, elevated pricing bounded by measurable supply-demand imbalances should moderately reflect free markets. Purely technology-enabled profiteering arguments shade dynamic pricing through an unbalanced lens rather than examining holistic outcomes. If additional revenue funds expanded capacity like more drivers or hotels, markets normalize. Dynamic pricing promises fuller realization of free market potential relative to constraints of legacy batch pricing models as algorithms grow more representative of true short-term conditions. But its evolution warrants continued scrutiny to ensure pricing integrity relative to fundamental economic principles.

3. THE DOWNSIDES AND CONSUMER DISTRUST

3.1 Perception That Prices Only Surge, Not Fall With Lower Demand

While dynamic pricing in theory allows prices to shift in either direction tied to changes in market demand, a key criticism centers on the perception that prices predominantly surge under demand-based pricing models rather than similarly declining during periods of weaker demand. This sentiment contributes to distrust in the integrity and fairness in dynamic pricing implementation among consumers more attuned to instances of what critics call “price gouging” during peak demand.

Part of conflict lies in asymmetry between consumer and producer incentives. Businesses adopt dynamic pricing first and foremost to drive higher profitability – whether more per transaction during temporary spikes or higher sales during lulls. But the consumer fixates more on absolute price paid rather than inventory utilization or revenue optimization rationales. So dynamic pricing fueled mainly by machine learning algorithms predicting increased willingness to pay draws customers skeptical over true drivers. Compounding matters, some early adopters of dynamic pricing chose opportunities like concerts, sporting events or holidays prone to demand-based price surging absent simultaneous offsetting declines during lower-interest periods.

Research suggests everyday dynamic pricing changes across industries mostly run plus/minus 10–25% driven by demand variability. But news headlines typically spotlight examples of more extreme price hikes from rideshares doubling fares on New Year’s Eve or 200–300% ticket markups for hot concerts on secondary markets absent comparable discounts. Negativity bias in human psyche makes these prominent cases over representative of overall model implications. Without offsets like airlines reducing prices during vacations or hotels offering special discounts amid group booking shortfalls, perception centers more on opportunistic inflation.

Partly the disconnect owes to lagging transparency mechanisms revealing the bidirectional efficacy of dynamic pricing for consumers relative to producers. Companies utilize cloud-based analytics ingesting myriad data signals to detect micro-shifts in demand indicators and willingness to pay signals. But customers lack similar visibility having to trust that posted prices at a moment genuinely reflect some



measurable market shift. Some emerging practices around surfacing price histories, comparisons or variance drivers help, but perception gaps persist.

Also, slower adoption of dynamic pricing during demand troughs limits concrete consumer evidence of declines as well. Outside of seasonal sales in distressed retail, many industries hesitate applying dynamic pricing in both directions. Hotels and airlines only grudgingly reduce rates amid group booking shortfalls or mediocre early flight reservations. Rideshares stay mum on true driver supply ratios that could support lower prices when demand lulls. The asymmetry sustains negative perceptions around fairness and gouging.

But potential exists for platforms exposing customers more uniformly to both price surging and plunging depending on temporality. Amazon and Uber build reputations for demand-based pricing variability in both directions, capturing customer mindshare around contextual value exchange. Companies that centralize inventory management also gain flexibility to spotlight selective discounts dynamically across regional markets, niche segments or lagging categories to stir demand. The vision of responsive pricing tuning up and down per market demand exists though mainly unrealized. But its fuller manifestation could rebalance perceptions toward the promise rather than skepticism of dynamic pricing tied more evenly to demand triggers. Real-time transparency, openness and participant education emerge as key parallel priorities with technology advancement to unlock that potential.

3.2 Lack of Transparency in How Demand Metrics Are Set and Pricing Models Created

Another prevailing criticism of dynamic pricing lies in the ambiguous processes used by companies to actually construct demand measurement and implement pricing changes rooted in those signals. Unlike fixed pricing schedules updated periodically based on forecasting, dynamic pricing shifts prices through technology-enabled automation relying on algorithms ingesting and interpreting myriads of demand signals in real-time. This allows more responsive price changes but spurs questions around the integrity or fairness behind the underlying demand analytics and models.

While dynamic pricing at surface level resembles free market supply-demand dynamics, the proprietary data inputs, conversion rules, and customized algorithms effectively act as a “black box” to customers on the receiving pricing end. Consumers lack visibility into specific metrics being analyzed from first-party sales data, third-party event or travel indicators, competitor rate parsing, or external factor assessments that companies feed into machine learning models. Vague “market dynamics” or “demand surges” become catch-all rationales when customers probe the reasons behind dynamic pricing changes.

Even basic queries from consumers around whether competitor bookings, inventory expiration risks or recent sales fluctuations truly validate a dynamically set price increase go unanswered without transparency. Companies rarely reveal actual occupancy, average booking levels or percentage rate changes underpinning new prices. Yet they expect consumers to trust pricing integrity. This information asymmetry risks accusations of opaque practices vulnerable to manipulation absent independent auditing or oversight. Questions swirl around what specific demand changes justified the latest round of price adjustments and whether technology is being exploited more for profit ambitions over fairness principles.

Contrast the lives of revenue management analysts at airlines, hotels and rental car agencies who enjoy a full suite of dashboards charting metrics from booking loads to cancellations/amends to length of stay to special event calendars. Why doesn't the consumer enjoy similar visibility? Instead, they face a one-sided proposition to accept the latest price point devoid transparency behind its basis. While base fares and rates have always

required some baseline trust, the active modulation of dynamic pricing appears to consumers as uncontrolled and biased absent transparency.

Even basic FAQs explaining key drivers and decision factors in pricing would aid perception. Describing the types of metrics analyzed and sharing sample dashboard visualizations from both high and low demand periods establishes baseline transparency. Explaining the governance policies, approval standards, exception handling and periodic auditing around automated dynamic pricing alleviates some uncertainty. Companies can benchmark historical price ranges relative to demand markers without disclosing proprietary data.

Candid explanations about why current conditions align differently versus prior periods builds understanding. Sharing dynamic price change distribution in both upward and downward directions counters gouging criticisms. While reticence around transparency persists for fear of losing competitive intelligence, market influence or flexibility, findings suggest smart transparency choices can bolster consumer trust, fairness perceptions and brand reputation without forfeiting key advantages. The incentives around opaque practices require recalibration to deliver fairness alongside agility.

3.3 Feeling That Processes Are Manipulative or a Scam to Overcharge Consumers

Skepticism over dynamic pricing also manifests through a persistent consumer sentiment that the underlying processes enabling fluid price changes are deliberate mechanisms to manipulate buyers and overcharge for goods/services. In absence of sufficient pricing transparency, consumers increasingly view pricing as a variable slipped from anchored market forces now beholden more to exploitative algorithms carefully creating façades around true supply-demand conditions. This fuels accusations of profiteering flying unchecked absent regulatory protections.

The distrust ties back to perceived information and power asymmetry. Sellers enjoy a surplus of data, analytical talent, adaptive technology, pricing latitude and insider knowledge of market forces relative to consumers. Short of taking a weekend microeconomics refresher course, customers feel information disadvantage in trying to decipher whether current prices legitimately reflect some measured shift in market dynamics or simply opportunistic inflation. When prices can change by the hour devoid typical ceilings, fears of predatory pricing flourish absent reassurance.



Fig -3: Manipulation and Scam

So, while companies inject dynamic pricing into everything from stadium seating to package delivery to electric vehicle charging stations under the guise of calibrating prices to balance accessibility and revenue, consumers increasingly grapple with discerning where producer profit pursuit ends and fairness safeguarding begins. Critics point to excessive hidden fees across airlines and resorts as an indictment of



unchecked practices despite perpetual customer dissatisfaction. Dynamic pricing appears poised to further that trend – using leverage borne through data and automation asymmetry to extract higher yields absent commensurate value clarity for buyers.

The feeling manifests when companies selectively apply dynamic pricing to already high-demand goods/services like holiday e-commerce shopping, summer hotel bookings, or concerts rather than universal implementation. This usage profiling suggests deliberate advantage-taking of peak consumer desire over equitable deployment. Researchers find that while two-thirds of companies use dynamic pricing for revenue gains, less than one-third cut prices to stimulate demand during lulls thus underscoring the perception biases. And burning trust carries long-term side effects on loyalty and sentiment.

While data and analytical sophistication should empower companies to more precisely tune pricing across market variations, consumers question whether organizations will instead masterfully puppeteer conditions specifically to extract greater revenue absent checks-and-balances. Pointing to rising income inequality and corporate power, dynamic pricing faces the tough branding obstacle of reassuring rather than deterring the everyday consumer in democratizing access over manipulating customers devoid ethical boundaries.

Restoring balance necessitates re-examining pricing processes through the lens of served customer fairness over solely corporate revenue. Metrics capturing consumer willingness-to-pay must sit alongside satisfaction, perceived fairness and repurchase rates. Cross-department consensus between marketing, analytics and operations around ethical standards likely requires elevation to executive leadership. Ultimately dynamic pricing needs comprehensive governance controls ensuring corporate stewardship – around both intended marketplace advantages and unintended consumer consequences. Benefits manifest not through masterful exploitation but jointly through systems, transparency and buy-in evolving pricing mechanisms in the service of shared value.

4. CASE EXAMPLES OF CONSUMER BACKLASH

4.1 Wendy's Attempt at Demand-Based Burger Pricing

One of the more visible case studies around the potential consumer backlash tied to dynamic pricing played out around a failed 2024 test by global quick service restaurant chain Wendy's across select United States markets. The initiative looked to introduce demand-based, real-time price changes for food menu items pegged to customer traffic levels inside individual stores. However, fierce social media outrage over the perceived exploitative program forced the company to swiftly abandon rollout plans fully within the week.

The program dubbed "Dynamic Pricing" was designed to charge customers slightly higher prices at high-traffic locations during peak lunch and dinner rush hours where meeting demand proved most stressful for restaurant operations and staffing. For example, a Baconator burger costing \$6 might rise \$0.20 during an evening dinner surge. Meanwhile slower mid-afternoon periods could see discounts of equal amounts to incentivize fill-in traffic when operational capacity exceeded demand. So rather than a fixed menu price schedule across dayparts, locations would fine-tune item pricing up and down a few percentage points based on real-time traffic to smooth flows.

Wendy's framed the price elasticity as means to pass slight additional costs during peak volume rushes when customer density climbed higher. And late-night or mid-day slack could see corresponding decreases to encourage visits aligned to lulls in operational resource usage intensity. From a production economics standpoint, the logic held – during compressed periods of frenzied production and service, small bumps to



smooth consumer demand aligned with Wendy's labor model. But customers saw things differently through a perception prism centered more on value parity and fairness.

On one hand, supply-demand driven price variability already manifests across industries from Uber's surge pricing to airline yield management so why not quick-serve restaurants? But the practice violates entrenched customer anchors around fixed menu board prices as representative of a nominal, fair meal cost. Unpredictable changes violate consumer sense of control and price certainty retention at their trusted brand. So, outrage emerged quickly as patrons took to comment threads and Twitter alleging Wendy's looked to profiteer off its most loyal supporters through targeted dynamic price spikes. Vows to shift patronage to competitors also swiftly took root.

Within five days, the company fully relented on launching its dynamic pricing initiative citing need to reevaluate program merits relative to critical customer reception. The tone-deafness reflected poor alignment between innovation goals and customer expectations of brand relationship. It spotlighted gaps in change management, stakeholder inclusion and loyalty protection strategies necessary to responsibly test disruptive ideas in the marketplace. Wendy's provides a case study for organizations on the delicate line between ambitious innovation intent and customer trust preservation - while promising concepts hold potential, brands must vet impact holistically across technical, operational and relationship domains to navigate those tradeoffs responsibly before acting.

4.2 Complaints Over Surge Pricing for Movies at PVR Cinemas

Leading Indian multiplex cinema chain PVR Cinemas has faced significant consumer backlash since 2022 after introducing demand-based dynamic pricing for movie tickets during certain peak periods like weekends, holidays and special event movie premieres. While dynamic pricing had become more prevalent internationally across travel, rideshares and entertainment to better modulate capacity, the concept violated entrenched consumer anchors in India around fixed movie ticket pricing. Accusations of exploitative price gouging quickly mushroomed leading legislators to even question the rationale behind differential pricing practices absent stricter controls.

PVR responded to post-pandemic box office growth in 2022 by testing dynamic pricing to incentivize greater patronage during lower demand shows in late mornings, midweek and non-peak periods. But simultaneously they allowed prices for premium releases during Friday nights, Saturday evenings and Sunday afternoons to rise dynamically by Rs. 100-200 to reflect heightened demand. So, a Gold Class seat priced nominally at Rs. 800 could surge above Rs. 1,000 during a new blockbuster movie release over a busy weekend.

The company justified price increases tied specifically to heightened consumer demand whether due to holidays, weekends or anticipation around certain movie titles and formats. Similar to Uber increasing fares during rush hour in the context of ridership patterns, PVR linked dynamic prices to observable spikes in moviegoing demand visible through faster sell-out rates for key shows. From a revenue optimization lens for better capacity utilization, the practice followed logic.

However, consumer groups argued peak demand surging betrayed loyalty by long-time patrons who supported cinemas during pandemic shutdowns and slow recovery periods after reopening. Why now impose penalty pricing after restoration of viable audiences just to expand margins further? Others called out asymmetry in selective application of dynamic pricing only during demonstrated demand highs rather than also lowering prices equally during observable softness. This last critique evoked accusations of distorted free market principles.



By October 2022, a Member of Parliament formally questioned in the Lok Sabha chamber the Minister of Consumer Affairs around the purportedly unfair differential pricing policies of multiplexes like PVR Cinemas that distorted consumer trust. While dynamic pricing had gained adoption internationally, the local context of customer sensitivities remained unreconciled sparking furor. Consequently, in November, PVR shelved plans around further expansion of dynamic pricing to shield itself from deepening political arguments and customer churn.

The case reflects challenges companies face when innovating on pricing models in categories carrying entrenched consumer expectations, amplified in India by socio-political dynamics. While data analytics promise smarter revenue management, brands must vet disruptive advances for unintended fairness gaps rather than solely efficiency upside. Managing positive change requires evaluating technical optimizations alongside customer sentiment distortions. As machine learning and cloud infrastructure lower barriers, creative pricing warrants vigilant empathy. Absent consensus acceptance, what seems logical in isolation can provoke fierce objection when applied devoid appropriate transparency.

5. THE NEED FOR REGULATION AND FAIRNESS STANDARDS

5.1 Mechanisms to Monitor Extent and Implementation of Dynamic Pricing

One prominent gap as dynamic pricing expands across travel, entertainment, retail, and service industries involves sufficient governance mechanisms to track the pervasiveness, integrity and fairness impacts tied to demand-based pricing in the marketplace. Beyond companies themselves monitoring internal performance dashboards, discussion emerges on necessity of external oversight given potential conflicts of interest between corporate profit goals and consumer advocacy priorities. Absent consistent standards, implementation transparency or independent audits, risks heighten that unfair practices manifest absent accountability just as public criticism of unchecked dynamic pricing mounts.

Regulators point to how prevailing guidance limiting dynamic pricing stays silent across most industries. Rare exceptions exist like caps on Uber's surge pricing during emergencies to prevent gouging. Best practice guardrails center more on self-governance – airlines avoiding extreme variability, hotels maintaining rate parity to avoid discrepancies between same room prices on online travel agencies versus direct sites. But formal policies or progress tracking on responsible implementation has lagged the acceleration in adoption.

From one perspective, companies deserve latitude to set prices aligned to business context amidst competing openly. However external oversight proponents counter that cross-industry standards establishing acceptable dynamic pricing guardrails could help remedy common consumer objections. For example, regulators could sharpen restrictions against unwarranted surge percentages beyond costs tied specifically to capacity expansion like overtime wages or equipment rentals. Hotels in Portugal now face maximum dynamic rate swing allowances.

Elsewhere requirements might demand heightened transparency like utilizations rates supporting a occupancy-driven room increase at a hotel or concerts detailing ticket holdbacks by section. Caps on daily or weekly change frequencies could prevent perceived gaming. Disclosing distribution on price drops versus surges or documenting public reactions to changes could deliver balanced views for regulators beyond internal data.

Emergent proposals even suggest creation of a consumer watchdog organization focused specifically on dynamic pricing fairness. It would aim to standardize disclosures like average price changes or metrics driving variability. Set percentage thresholds on maximum price movements based on documented system



costs could counter gouging claims based on context like disasters or necessity services. Aggregate complaint escalations or mediation rulings when disputes arise would flag bad practices for further investigation.

While still early across deeply fragmented categories, the acceleration of dynamic pricing begs questions on responsible oversight ensuring imbalanced corporate power does not lead to consumer disadvantage. The inherent conflicts likely require external governance mechanisms to broker standards balancing innovation possibilities with ethical safeguards and accountability as more intimate transactions move to impersonal algorithms. Implementation notifications, transparent tracking indices or pricing variability impact studies represent pathways policymakers have available to move toward a middle-ground supporting data-led marketplaces while ensuring equitable protections.

5.2 Rules Around Transparency for How Demand is Measured and Price Thresholds Set

Another area policymakers observe as ripe for potential regulation involves enacting formal rules to mandate greater transparency from companies on methodologies used to measure fluctuating market demand and establish pricing thresholds leveraged by their dynamic pricing engines. As explore previously, much of the consumer mistrust tied to dynamic pricing stems from the ambiguous and proprietary nature of demand analytics feeding real-time pricing algorithms.

Absent visibility into data sources, calculation formulas, trend assessments, and price adjustment decision factors, customers harbor doubts whether prices genuinely reflect market dynamics or simply unchecked algorithms engineered to maximize revenues devoid supply-demand ties. This perceived opacity fuels suspicions around ulterior motivations for price shifts, questions on process integrity, and accusations of manipulative practices absent factual grounding.

Regulations now emerging across global jurisdictions look to remedy dim transparency through standardized disclosure rules on dynamic pricing mechanisms for consumers. Initial proposals focus on supplying simple explanations around methodologies powering pricing variability to foster better comprehension. For instance, documentation would cover types of indicators analyzed, whether first-party sales patterns, third-party event data, inventory metrics, competitive rates, or macroeconomic variables.

Descriptions could spotlight how algorithms interpret trends, contextualize signals against seasons and baseline averages, handle outlier data that may skew outputs, and monitor accuracy over time for model refinement. While respecting commercial sensitivities around actual proprietary analytical models, regulators assert companies still owe customers insightful policy documentation on credential processes supporting pricing infrastructure similar to requirements already governing areas like privacy policy communication.

Another potential transparency mechanism involves requiring dynamic pricing practitioners to supply historical price variation reports cataloguing intra-period changes across calendar quarters or annual cycles. Such reporting would visually showcase through graphs/charts the concrete demand circumstances prompting price increases vs. declines. The aim centers on concretely demonstrating to consumers that dynamic pricing operates bidirectionally rather than solely surging prices absent commensurate downward movements during low-demand intervals.

To counter accusations of inequitable access or price manipulation absent oversight, regulators also have power to demand firms detail data flows ingested by algorithms and even compel access to anonymized control groups for evaluating model behavior absent usage restrictions. Golden handcuffs through raised



penalties serve to discourage arbitrary profiteering strategies devoid underlying demand drivers. The broader goal focuses on supplying consumers, or designated proxy groups evaluating on their behalf, enough baseline transparency to assess whether dynamic pricing lives up to balanced intents rather than unchecked exploitation targeting temporary peaks absent ethical safeguards.

5.3 Ensure Reasonable Bounds to Prevent Predatory Overpricing

In addition to transparency mechanisms, policy discussions around regulating dynamic pricing also prioritize enacting standards that reasonably constrain percentage price increases driven by algorithms to prevent unlawful predatory overpricing devoid of ethical boundaries. Critics caution that absent oversight on excessive price ceilings, dynamic pricing engines will inevitably drift towards unchecked profiteering that targets vulnerable moments for consumers rather than moderated maximization balanced against fair access principles.

Regulatory precedents already govern areas like price gouging prohibitions during emergencies across necessities or anti-trust laws preventing monopolistic firms from abusing market power through unjustified price hikes that squash competition. These aim to limit exploitation of temporary advantage periods to unfairly maximize profits counter to consumer welfare priorities. Now similar regulatory discussions emerge specific to nascent dynamic pricing implements warranting boundaries.

Early proposals suggest default guards against excessive percentage surge increases over documented baseline costs as the fundamental basis for reasonable restraint. For example, hotel revenue managers counter that dynamic rate algorithms consider local event factors, seasonal demand shifts and competitive rate parsing to make pricing decisions rather than cost inputs alone. However, watchdogs can request substantiation data on specific cost accelerators like overtime wages, equipment rentals or inventory expiration write-off risks that validate a set percentage increase as "reasonable" increase warrants.

Other discussions involve capping peak variability for prices on staple goods/services at 25-50% ceilings absent extenuating circumstances given inelastic demand curves. Regulators can also constrain daily or weekly change frequencies by firms to prevent perceived gaming viewed as predatory in absence of sudden demand shifts. Mandatory discounting requirements to stimulate counter-balancing demand during expected seasonal troughs also discourages singular optimization only around peaks.

Overall, these constraints around responsible ceiling thresholds aim to bound revenue pursuit ambitions within acceptable limits relative to the contextual product and consumer sensitivities. Just as society constrains unfettered freedoms at the point harm manifests to others, similar arguments hold for dynamic pricing absent moderation against social welfare impacts. Technology unlocks potential but requires ethical application - establishing oversight through base pricing increase limits and permissible variability constraints allows innovation possibilities balanced alongside consumer protections as machine learning prediction capacities escalate.

5.4 Increase Consumer Understanding of Rationales Behind Model

Finally, among the priorities regulators and industry groups highlight as imperative for responsible dynamic pricing oversight includes significantly escalating consumer education around underlying model rationales, mechanics and limitations. Rather than allowing information gaps to fuel skepticism and distrust through assumptions of profiteering devoid ethical checks, sustained educational initiatives show promise in aligning



customer perceptions with legitimate applications – provided appropriate transparency and integrity safeguards manifest.

Surveys reveal that nearly 60% of consumers perceive dynamic pricing practices as "unfair" driven overwhelmingly by feeling prices arbitrarily surge but rarely fall commensurately during periods of reduced demand or higher costs requiring supplier offset. However, when exposed to data highlighting pricing model impacts in both directions and fact-based examples demonstrating technology limitations around predicting precise demand curves or cost accelerators, negative preconceptions of dynamic pricing soften considerably.

This underscores how ambiguity breeds contempt – absent grounded understanding in how dynamic pricing aims to strike a balance between revenue optimization potentials with accessibility commitments during periods of scarcity, customers view the concept skeptically. Sharing tenets around underlying algorithms built off machine learning that ingest historical datasets on local demand shifts, event-based deviations, seasonal variability factors and real-time market rates better contextualizes automated reasoning behind price fluctuations.

Transparent data highlighting how predictive models balance risks around idle capacity, inventory spoilage and competitive environments explains the rationale driving some upward or downward changes rather than wanton profiteering interpretation. Emphasizing how dynamic pricing emerged from regulated industries like airlines centered on maximizing asset utilization and minimizing waste higher up Maslow's hierarchy of needs than base goods plays an anchoring role.

Even unveiling model simulation outcomes revealing limitations around predicting precise demand curves or impacts demonstrates the experimental nature warranting continuous learning. Such revelations aid perception by departing from opaque signals of perfection around precision pricing devoid tradeoffs. Together these pillars of lifting the curtain behind context, mechanics and uncertainties humanize dynamic pricing as an emergent economic lever still necessitating collaborative refinement.

While regulations establishing oversight guardrails remain imperative, the parallel priority around elevating consumer comprehension targets the heart of distrust objections head on. Blending increased pricing variability mindfulness into consumer education mainstays around personal budgeting, inflation impacts, and behavioral economics can organically drive adoption and trust. Getting there however necessitates shared commitment across public and private sector voices converging not just on regulations but baseline understanding laying stakes for transparent development.

6. CONCLUSION

6.1 Dynamic Pricing Has Useful Applications but Needs Checks Against Abuse

In closing, dynamic pricing stands as an economically rational innovation leveraging technology to unlock revenue and inventory optimization potential for suppliers across an expanding range of industries. However, its acceleration further necessitates reasonable constraints and ethical safeguards to prevent abuse or unintended consequences eroding consumer trust. Finding the right equilibrium rests on addressing transparency, education, and oversight gaps.

At its core, dynamic pricing powered by machine learning algorithms aims to maximize latent demand by calibrating prices to documented market fluctuations in supply and demand. What emerges across travel, entertainment, retail, dining, and services holds usefulness grounded in responsibly elevating asset utilization,



reducing waste from unused perishable capacity, and sustaining operations via optimized yield management. Consumers also benefit from expanded access windows aligned to personal budget constraints.

However, the same technology and analytics asymmetry between companies and consumers also risk imbalanced, unchecked practices manifesting absent oversight guardrails on pricing integrity, variability thresholds and transparency requirements. Data-empowered personalization left unregulated threatens to swing the pendulum too far towards profit prioritization absent shared value considerations – suppressing rather than unleashing innovation possibilities detrimentally.

While still early across this economic frontier, findings suggest the solution lies not in restricting dynamic pricing advancement but ensuring its ethical application. Technologies enabling more customized service hold promise but require thoughtful constraints against intentional and unintentional harms. Multi-stakeholder guardrails can maintain incentives around innovation alongside protections against abuse.

Emergent proposals around pricing integrity audits, increased transparency rules, variability caps and complaint escalation mechanisms aim to check tradeoffs responsibly. Their manifestation warrants acceleration alongside technical capacity. Winning strategies also likely necessitate consumer education pairing – around balancing revenue essentials and social responsibilities when leveraging automation in market transactions.

Overall dynamic pricing shows useful promise as a demand lever if developed transparently and applied conscientiously. But it equally risks customer alienation if deployed ambiguously and devoid oversight. Reaping full upside requires affirming technology possibilities while confirming relationship anchors. Blending the strengths of data analytics, process clarification and governance principles can unlock that responsible way forward benefiting consumers and companies collectively.

6.2 Finding Right Balance Can Benefit Both Companies and Consumers

Finally, dynamic pricing has reached an inflection point when appropriately addressing inherent tradeoffs can pave the way for mutually aligned value realization that benefits both firms and consumers. But failing to implement appropriate transparency, integrity and fairness safeguards also risks eroding economic potentials and trust. Delivering positive change necessitates multi-stakeholder collaboration willing to balance innovation possibilities against ethical application.

As the acceleration of this pricing approach continues across travel, entertainment, retail, automotive, utilities and financial services, no shortage of use cases persist where precision modulation of demand levers can tighten revenue yield management. Optimized utilization means fuller venues, fewer empty airline seats or idle goods trapped by shelf life constraints. Monetizing willingness to pay additionally funds capacity expansions like more drivers during busy periods. Quicker response to local tastes powers cultural resonance. Targeting anomalies affords loss prevention. The technical artistry around optimizing commercial transactions shows no signs of abating given data and analytics tailwinds.

Equally, opportunities become abundant to overexploit asymmetry devoid empathetic moorings if unchecked. Machines solely maximizing profits risk normalizing exclusion where abundance reigns. Opaque variability rationales drain relationship reservoirs without reciprocity. Precision devoid perspective distorts market fairness. Hence the great balancing act begins between capabilities and consciences, safely nurturing advances customers also consent towards rather than reticently abide.



Promising pathways take shape across transparency, variability constraints, audit protections, complaint escalations and participant education on dynamic pricing intricacies. Their manifestation can affirm upside while securing protections against breaches of trust or social compact erosion. Rather than presumed tradeoffs between corporate revenue gains and consumer anxiety, innovations like centralized pricing dashboards detailing rationale data, measured rate thresholds benchmarked against documentable costs, external councils vetting changes, and pricing mentoring resources counterbalance interests more holistically to enable advancement absent divisiveness.

Overall dynamic pricing shows useful promise as a demand lever if developed transparently and applied conscientiously. Technology unlocks economic value but requires ethical guardrails and participant mindset maturation enabling responsible innovation co-existence. Pursued jointly, possibilities arise benefiting consumers through fairer choice freedom and companies via smarter commercial outcomes worthy of the price paid across financial statements and society ledgers. But getting there starts with collective commitment to balancing productivity with principles.

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