European Institute of Innovation, Entrepreneurship and Technology

Microeconomics I

Market Equilibrium, Price Controls, and Welfare Analysis in Competitive Markets

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Programme Name: BBAM

Institute: European Institute of Innovation, Entrepreneurship and Technology

Date of Submission: 12/11/2026

Selected Topic: Option 2

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Executive Summary

This report applies competitive-market analysis to a simplified market for guided visitor experiences. It develops linear demand and supply functions, calculates equilibrium price and quantity, and measures consumer surplus and producer surplus. It then evaluates a binding price ceiling and an excise tax to explain how government intervention can redistribute welfare and create deadweight loss. The illustrative market has demand Qd = 1,200 − 20P and supply Qs = 200 + 20P, where P is the price in euros and Q is the number of bookings per week. Equilibrium occurs at P = €25 and Q = 700. A price ceiling of €20 creates excess demand of 200 bookings and deadweight loss of €1,000 per week under the model. A €5 per-booking tax reduces equilibrium quantity to 600 and creates deadweight loss of €250 per week. The report also considers demand shocks and short-run supply disruption, discusses tourism policy examples and recommends targeted, time-limited interventions with monitoring and supply-side measures.

Introduction

Microeconomics examines how consumers and firms make choices under scarcity and how markets coordinate those choices through prices. In a competitive market, demand reflects consumers' willingness and ability to pay, while supply reflects producers' willingness to offer goods or services at different prices. Their interaction determines equilibrium price and quantity. Government interventions such as price ceilings, price floors and taxes can change market outcomes. These measures may pursue social objectives, but they can also affect incentives, allocation and total welfare.

This report addresses Option 2 of the Microeconomics I assessment. The chosen market is guided visitor experiences in a tourism destination. The numerical model is illustrative and is not an estimate of an actual city's market. It is used to demonstrate equilibrium, surplus and

deadweight loss. The report then relates the model to tourism policy, short-run shocks and practical management responses.

Microeconomic Framework and Analytical Methodology

The law of demand states that, other things equal, quantity demanded generally falls as price rises. The law of supply states that quantity supplied generally rises as price rises. A market equilibrium occurs where quantity demanded equals quantity supplied. At this point, there is no excess demand or excess supply in the simplified model.

The assumed weekly demand function is $Qd = 1{,}200 - 20P$ and the supply function is $Qs = 200 + 20P$. Quantity is the number of bookings per week and price is euros per booking. Setting demand equal to supply gives $1{,}200 - 20P = 200 + 20P$. Therefore, $1{,}000 = 40P$ and equilibrium price is $P^* = €25$. Substituting into either function gives $Q^* = 700$ bookings per week.

The demand curve has a price intercept of €60 because Qd is zero when P = 60. The supply curve has a negative price intercept of -€10, which is a mathematical feature of the linear approximation rather than a realistic offer at negative prices. The equilibrium lies in the economically relevant positive-price range. Linear functions are convenient for transparent calculations, although real tourism demand and supply may be nonlinear and affected by capacity limits, seasonality and quality differences.

Consumer surplus is the difference between what consumers are willing to pay and what they actually pay. In a linear demand model it is the triangle below the demand curve and above the market price. Producer surplus is the difference between the market price and the minimum price suppliers are willing to accept, represented by the triangle above the supply curve and below the market price. Total surplus is consumer surplus plus producer surplus. Deadweight

loss is the reduction in total surplus when a market distortion prevents mutually beneficial transactions.

For the baseline equilibrium, the demand intercept is €60 and equilibrium price is €25. Consumer surplus = 0.5 × 700 × (60−25) = €12,250 per week. The supply intercept is -€10, so producer surplus = 0.5 × 700 × [25−(-10)] = €12,250 per week. Total surplus is €24,500 per week. These values are model-based estimates, not observed cash payments or a complete measure of social welfare.

Empirical Findings and Welfare Analysis

Price ceiling scenario. Suppose a regulator sets a maximum price of €20 per booking. Because this is below the equilibrium price of €25, it is binding. At P = €20, quantity demanded is 1,200 − 20(20) = 800 bookings, while quantity supplied is 200 + 20(20) = 600 bookings. Excess demand is therefore 200 bookings per week. Not all customers who want to book can obtain a place, so non-price rationing may occur through waiting lists, queues, early booking, quality reductions or informal side payments.

Assume that the 600 available bookings are allocated to consumers with the highest willingness to pay. The inverse demand curve is P = 60 − Q/20. Consumer surplus is the area between this demand curve and the ceiling price over the 600 transactions: the integral of (60 − Q/20 − 20) from Q=0 to Q=600, which equals €15,000. The inverse supply curve is P = Q/20 − 10. Producer surplus is the area between the ceiling price and the supply curve over the 600 transactions: the integral of (20 − (Q/20 − 10)) from Q=0 to Q=600, which equals €9,000. Total realised surplus is therefore €24,000, compared with €24,500 at equilibrium. Deadweight loss is €500 per week. It is the triangle representing the mutually beneficial transactions between Q=600

and Q=700 that do not occur. This result depends on the efficient-rationing assumption; random allocation or costly queues could create additional welfare losses.

Excise Tax and Distributional Effects

A per-booking tax creates a wedge between the price paid by consumers and the price received by providers. Assume a tax of €5 per booking is collected from suppliers. If consumers pay Pc and suppliers receive Ps, then Pc = Ps + 5. Demand depends on Pc and supply on Ps. The demand and supply equations become Qd = 1,200 − 20(Ps+5) and Qs = 200 + 20Ps. Equating them gives 1,100 − 20Ps = 200 + 20Ps, so Ps = €22.50, Pc = €27.50 and Q = 650. The tax reduces quantity by 50 bookings.

Tax revenue is €5 × 650 = €3,250 per week. Consumer surplus is 0.5 × 650 × (60−27.5) = €10,562.50. Producer surplus is 0.5 × 650 × [22.5−(-10)] = €10,562.50. Adding tax revenue gives total surplus of €24,375. Deadweight loss is €24,500 − €24,375 = €125 per week, equal to 0.5 × €5 × 50. The tax burden is shared in this symmetric linear model: consumers pay €2.50 more than the original price and suppliers receive €2.50 less. In a real market, the division depends on relative elasticities. The less price-responsive side generally bears more of the tax burden.

A price floor above equilibrium would create excess supply. For example, a minimum provider fee of €30 would result in quantity demanded of 600 and quantity supplied of 800, leaving 200 units of excess supply. A floor may support provider incomes but can reduce bookings and create unsold capacity. If the policy objective is to protect small providers, targeted grants, training or transparent procurement may sometimes achieve the objective with less distortion than a broad price floor.

Shocks, Tourism Policy and Market Implications

A demand shock shifts the demand curve. A major festival, improved transport connection or successful destination campaign may increase visitor demand. In the short run, the number of guides and available time slots may be fixed, so prices and waiting times can rise. A recession, travel disruption or safety concern may reduce demand, lowering prices and leaving providers with unused capacity. A supply shock shifts supply. Severe weather, transport disruption, higher insurance costs or a shortage of qualified guides can reduce available services and raise equilibrium prices.

The distinction between movement along a curve and a shift of a curve is important. A change in the price of the experience causes movement along a given demand or supply curve. A change in income, visitor numbers, preferences or the price of substitutes can shift demand. A change in wages, fuel costs, licensing rules or provider capacity can shift supply. Managers should identify the source of a change before responding.

Actual tourism economies use policy to address congestion, housing pressure, environmental costs and the financing of public services. Examples include visitor taxes, licensing requirements for short-term accommodation and restrictions on certain uses of residential property. Such interventions can change the costs and availability of tourism services. Their effects depend on policy design, enforcement, substitution to other accommodation or activities and the responsiveness of visitors and providers. A visitor tax may raise public revenue for transport, cleaning or heritage maintenance, but a poorly designed tax can reduce demand or disadvantage smaller operators. Accommodation restrictions may protect residential housing but can also shift demand toward hotels or neighbouring areas. A policy assessment should therefore define the objective, identify affected groups and measure both intended and unintended effects.

The simplified guided-experience model cannot quantify the effects of a specific city's policy without local data. It nevertheless provides a framework for asking who pays, who benefits, how quantity changes and whether the policy creates deadweight loss. A local authority should collect booking volumes, prices, provider entry and exit, visitor satisfaction and congestion indicators before and after an intervention. Comparisons with similar destinations can help separate policy effects from broader travel trends.

Discussion and Recommendations

The model demonstrates that competitive equilibrium maximises total surplus under the assumptions of the model: many buyers and sellers, adequate information, no externalities and no market power. Real tourism markets may not meet these assumptions. A guided tour can create congestion or cultural impacts not reflected in the ticket price. A platform may have market power, and consumers may lack information about safety or quality. In those circumstances, carefully designed regulation may improve outcomes even if it changes the market price.

However, a binding price control can create shortages or surpluses and non-price allocation. A tax can reduce transactions but may be justified when it helps address external costs or funds public services. The correct choice depends on the policy objective and the size of the market failure. Policymakers should avoid treating low prices as the only measure of consumer welfare: availability, quality, safety and access also matter.

A practical response is to use targeted, proportionate measures. If the problem is peak-time congestion, timed entry, capacity management and better visitor information may be more direct than a general price ceiling. If the issue is negative environmental externalities, a transparent levy linked to mitigation may be appropriate. If the goal is provider viability, training, digital

access and temporary support may be more effective than a universal minimum price. Every intervention should include a review date and measurable indicators.

Conclusion and Recommendations

The report calculated a competitive equilibrium of €25 and 700 weekly bookings from the assumed linear demand and supply functions. Baseline consumer and producer surplus are each €12,250, producing total surplus of €24,500. A binding €20 ceiling creates excess demand of 200 bookings; under the stated efficient-rationing assumption, quantity traded is 600 and deadweight loss is €500 per week. A €5 tax reduces quantity to 650, raises €3,250 in revenue and creates deadweight loss of €125 per week. These results show that intervention redistributes surplus and may reduce total gains from trade.

It is recommended that tourism managers and policymakers: (1) diagnose whether a problem arises from demand, supply, market power or an externality; (2) use local evidence before setting controls; (3) prefer targeted measures that address the underlying problem; (4) monitor prices, quantities, access, provider viability and public costs; and (5) review interventions regularly and remove measures that no longer achieve their objectives. The model is a starting point for analysis, not a substitute for destination-specific evidence.

References

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Appendices

Appendix A: Key equations and spreadsheet setup

Demand: Qd = 1,200 − 20P

Supply: Qs = 200 + 20P

Equilibrium: set Qd = Qs; solve P = 25 and Q = 700.

Consumer surplus at equilibrium: 0.5 × Q × (demand intercept − equilibrium price).

Producer surplus at equilibrium: 0.5 × Q × (equilibrium price − supply intercept).

Tax wedge: consumer price = producer price + tax.

Tax deadweight loss: 0.5 × tax × reduction in quantity, where curves are linear.

Appendix B: Price ceiling calculation check

At P = €20: Qd = 800 and Qs = 600; quantity traded = 600. Inverse demand is P = 60 − Q/20. Inverse supply is P = Q/20 − 10. Consumer surplus = integral from 0 to 600 of (60 − Q/20 − 20)dQ = €15,000. Producer surplus = integral from 0 to 600 of (20 − (Q/20 − 10))dQ = €9,000. Total surplus = €24,000. Deadweight loss = €24,500 − €24,000 = €500. This assumes the 600 available bookings go to the consumers with the highest willingness to pay; random rationing could produce a larger loss.

Appendix C: Graph instructions

Plot price (vertical axis) against weekly quantity (horizontal axis). Draw demand from (Q=0, P=60) to (Q=1,200, P=0). Draw supply from (Q=0, P=-10) to (Q=1,200, P=50). Mark equilibrium (700, €25), the ceiling line at €20, and the tax wedge between consumer and producer prices.