



- **Lec n. : 17** 😊

- **Done by : Maram Al-wraikat**

♥ وَقُلْ رَبِّ زِدْنِي عِلْمًا ♥





# Elasticity



**Elasticity**  
[i-las-ti-sa-ite]  
A measure of a variable's sensitivity to a change in another variable, most commonly referring to demand as affected by other factors.

Investopedia

Part 2

Dr. Omnia Elmahdy

\* Price Elasticity of Demand/Supply : (Absolute value) ، ومارح تفرق معنا القيمة (+/-) ، تنظر لا

خلص زي شي، أكبر من 1 "Elastic" ، يوزي شي، أقل من 1 "InElastic"

إذا ركزت على (Not Direction) Number

\* في دي الامارة رح يكونوا نفس Curves تبعدن ال Demand بس الفرق : Demand (نازل) ، Supply (طالع)

\* مراجعة طريقة : Midpoint

The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities

The midpoint formula is more accurate when calculating the price elasticity of demand.

كانت نقسم على المتوسط  
 $(P_1 + P_2) / 2$   
 $(Q_2 + Q_1) / 2$

$$\text{Price elasticity of demand} = \frac{(Q_2 - Q_1) / [(Q_2 + Q_1) / 2]}{(P_2 - P_1) / [(P_2 + P_1) / 2]} \times 100$$

Example: If the **price** of an ice cream cone increases from **\$2.00 to \$2.20** and the **amount** you buy falls from **10 to 8 cones**, then your elasticity of demand, using the midpoint formula, would be calculated as:

$$\frac{(10 - 8) / (10 + 8) / 2}{(2.20 - 2.00) / (2.00 + 2.20) / 2} = \frac{22\%}{9.5\%} = 2.32$$

Elastic  
 هذه القيمة لا تدق

نام في هذه الملائمة مذكورة



الاساس الذي يتعمل بهيات (الأكاديميين)

Most academics believe that the price elasticity for medical services is between 0 and -1. This means that if prices increase by 10%, the demand for medical services decreases, but by less than 10%. This means that medical goods are inelastic.

← بس اعرفنا : Medical Practice is Inelastic

ما عدا Exceptions

Quiz : 😊

If the price of a physician service increases from 15 JD to 20 JD , the quantity demanded of the same physician service falls from 30 to 25 visit per day , PED ?

$$PED = \frac{\frac{(30-25)}{(30+25)/2} * 100\%}{\frac{(20-15)}{(20+15)/2} * 100\%} = \frac{18\%}{25\%} = 0.6 < 1 \text{ (Inelastic)}$$

← تون منتون التغير في Income قديش زح يؤزول Quantity Demanded

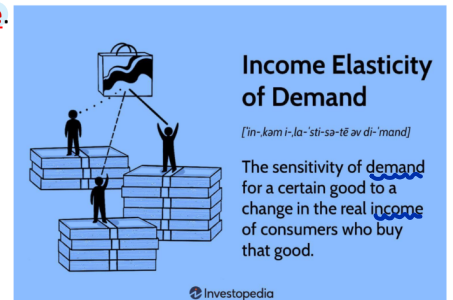
### الدخل Income Elasticity of Demand

• Income elasticity of demand measures how much the quantity demanded of a good responds to a change in consumers' income.

← كلما Income زاد زح يكون إقباله أكبر على الملائمة الأخرى / فبإرضائية أكبر

لو دخله (Income) قل فجأة ، زح يعيس إقباله على المزيويات + Law price

← تون الإثارة مهمة (+/-) حت نعرف دل جي Inelastic / Elastic



• It is computed as the percentage change in the quantity demanded divided by the percentage change in income.

معارفها ت

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

\* تون الإثارة مطلوبة كونه في (Two types of goods) زح  
\* والتايج ليس له وحدة (Unitless)

← منه ليست ثابتة فتختلف بين الأقسام ← إذا Income لخفض ↑ رز يدور Brand  
 ← " " " " " " " " الأرخس

Cheaper في الصلوات الرخيصة ليست Brand

with high cost (Brand)

1- Inferior Goods

2- Normal Goods

Off Brand ice cream

Branded ice cream

Travel by Train

Travel by aeroplane

Travel by a bicycle

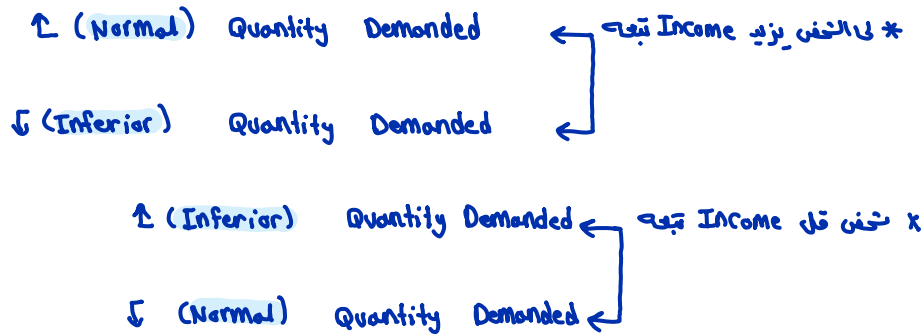
Travel by car

Wick stove

Gas stove

← لو قدرني الراجة بسيطت (رز اسافر بري بدل جوي)

(Business class رز أركب طائرة / رز أركب في)



**Types of Goods**

ع.خ

- **Normal Goods:** roses, cars, home services, name-brand clothing, laptop, and technology equipment.
- **Inferior Goods:** generic products, used cars, discount clothing, and canned foods.

\* جدول الأشكال (منهم ليس للفظ)

Higher income raises the quantity demanded for normal goods but lowers the quantity demanded for inferior goods.

Normal goods have positive income elasticities

\* معناها: كلما Income يزيد ، Demand for normal goods يزيد

inferior goods have negative income elasticities

كما زاد Income ، Demand for inferior goods يقل

↑ Demand for inferior goods  
 ↓ Demand for normal goods } \* إذا قل Income

عنك فيك نتائج (+/-)

Normal Good	
↑ An increase in income...	↑ increases demand.
↓ A decrease in income...	↓ decreases demand.
Inferior Good	
↑ An increase in income...	↓ decreases demand.
↓ A decrease in income...	↑ increases demand.

- Goods consumers regard as **necessities** tend to be income **inelastic**
- Examples include **food**, <sup>وقود</sup> **fuel**, **clothing**, and **medical services**.

\* Necessities ( clothing/ Food/ Medical services)

↪ **Inelastic**

- Goods consumers regard as **luxuries** tend to be income **elastic**.
- Examples include **sport cars**, **furs**, and **expensive foods**.

\* Luxuries (Elastic)

↗ Income لا



↘ Demand ↗ Income ←

Inferior / Normal ← بنا نعرف من العلاقة بالنسبة لها

↗ D (Normal) ↗ Income ← <sup>مبنى الكلف من دون حساب</sup> ↘ D (Inferior)  
وبما إنه هون قل، إذا في (Inferior)

Normal / Inferior ← ما يكون المؤال (احب) / أو قل

↗ Income (20000 و 22000) ، (2kg ↗ 1) ← لو كان المؤال  
له هون Normal Good

• Asma's **income rises from 20,000 SR to 22,000 SR** and the **quantity of hamburger** she buys each week falls from **2 kg to 1 kg**.

• % change in quantity demanded =  $(1-2)/1.5 = -.6667 = -66.67\%$   
*من الترتيب* *نتيجة فتأثير الإثارة*

• % change in income =  $(22,000-20,000)/21,000 = .0952 = 9.52\%$   
*من الترتيب*

• income elasticity =  $66.67\% / 9.52\% = -7.00$

**So, Hamburger is an inferior good for Asma**

↪ معنى (-)

\* Price ( Absolute Value) " كنهتم بالإثارة "

\* Income ( مرتبة الإثارة )

**Cross-price elasticity of demand** <sup>حدا ممتد</sup>

**Definition**  
A measure of how much the **quantity demanded of one good** responds to a **change in the price of another good**, computed as the **percentage change in the quantity demanded of the first good** divided by the **percentage change in the price of the second good**

**Cross Elasticity of Demand**

[ 'krɒs i-ˌlɑː-sti-sə-ti-əv dɪ-ˈmænd ]  
An economic concept that measures the responsiveness in the quantity demanded of one good when the price for another good changes.

↪ **تداعية**


وجدوا إنه لما يقل سعر سلعة معينة ، Demand على سلعة أخرى يزيد

**Marijuana And Cigarettes** : مثل



لما تقل أسعار Cigarettes ، Demand رجع يزيد على Marijuana

**Complements** وتدور مع بعض

فكرة Cross-price elasticity of Demand ← إنه التغير في سعر سلعة سيؤثر على Quantity Demanded لسلعة أخرى



**Cross Price Elasticity of Demand Formula** =  $\frac{\text{Percent Change in a Quantity of Good A}}{\text{Percent Change in the Price of Good B}}$

\* كون الإشارة جيداً مهمة

Complements عندما (سعر سلعة يقل ، Demand على الأخرى يزيد)

(Negative Relationship)

Substitutes عندما (سعر سلعة يزيد ، Demand على الأخرى يزيد)

(Positive Relationship)

**Substitutes** have **positive cross-price** elasticities, while **complements** have **negative cross-price** elasticities

• A company producing **torches** and **batteries** is analyzing the cross-price elasticity of the two goods. For example, the **demand for torches was 10,000 when the price of batteries was \$10**, and the **demand rose to 15,000 when the price of batteries was reduced to \$8**.

\* كون سعر Batteries قل فشجعت الناس على شراء

(Torches (نفس Marijuana And Cigarettes

العلاقة بينهم ← Complements

Complements Negative Cross-price elasticity

(عنا نبيك اصبحنا الانارة)

\* بالامكان : عد الانقلب مائة وحدة (حساب)

والباقي يدل عن طريف المهم ✓

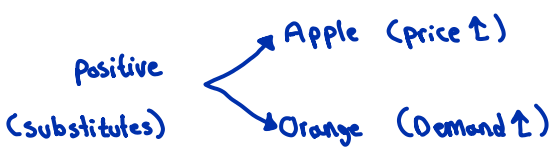
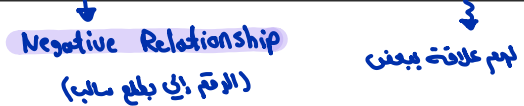
- Percentage change in the number of torches  

$$= \frac{(15000 - 10000) / (15000 + 10000)}{2} = \frac{5000}{12500} = 40\%$$
- Percentage change in price of batteries  

$$= \frac{(8 - 10) / (10 + 8)}{2} = \frac{-2}{9} = -22.22\%$$

Thus, cross-price elasticity of demand =  $40\% / -22.22\% = -1.8$

Since the cross-price elasticity of demand for torches and batteries is **negative**, thus these two are **complementary** goods.



• The **price of apples** rises from **\$1.00** per Kg to **\$1.50** per Kg. As a result, the **quantity of oranges** demanded rises from **8,000** per week to **9,500**.

• **% change in quantity of oranges** demanded =  $(9,500 - 8,000) / 8,750 = .1714 = 17.14\%$

• **% change in price of apples** =  $(1.50 - 1.00) / 1.25 = .40 = 40\%$

• cross-price elasticity =  $17.14\% / 40\% = 0.43$

Because the cross-price elasticity is **positive**, the two goods are **substitutes**

Local And Brand Medications / برتقال و دجاج / اذ اطلع الرقم (+)

\* Law of supply ( Price ↑ , supply ↑ )

يبيع ملاء المنتج كم أنتج ؟

**THE ELASTICITY OF SUPPLY**

- Price elasticity of supply is a measure of how much the quantity supplied of a good responds to a change in the price of that good.   
 (Definition to what extent)
- Price elasticity of supply is the percentage change in quantity supplied resulting from a percent change in price.   
 (لنفس المدة)

**PRICE ELASTICITY OF SUPPLY FORMULA**

$$PES = \frac{\% \text{ Change in quantity supplied}}{\% \text{ Change in price}}$$

→ I want the number (Not the Direction)

One of the important determinants of price elasticity of supply is the nature of the product itself. For example, goods that are essential for basic needs, such as food and clothing, tend to have a relatively inelastic supply, while luxury goods, such as jewelry and expensive cars, tend to have a more elastic supply.

Determinants

\* Nature of the product

1- Basic Needs

( supply → Inelastic )

\* كأنها أمور أساسية فغالبا يتم انتاجها بكمية ثابتة ويتم شراؤها بكمية ثابتة

2- luxury Goods

\* لوسعرها زاد ، رح ينتجها بكميات أكبر كأنه رح يستفيد أكثر

Summary

Basic Needs (Supply / Demand) → Inelastic

Luxury good (Demand/ supply) → Elastic



← Cars من في (Elastic / Inelastic supply) ؟ ↑ P رح يستوردوا سيارات أكثر

→ Beach-front land (Inelastic)

علاوة على ذلك إنها عالية القيمة ، ليه ؟ كأنه في أماكن معينة و بجز معينة ما منقدر نزيد عددكم

فترات اللوحة تكون (Luxury) ← But inelastic (وإنها Rare very)



The Amount of supply ↑ (الكمية تبتدأ تبتج كميات أكبر)

The price of rice increased from 2.85 JD per kg to 3.15 JD per kg and the quantity supplied rises from 9,000 to 11,000 kg per month.

% change in price =  $(3.15 - 2.85) / 2.85 \times 100\% = 10\%$   
 % change in quantity supplied =  $(11,000 - 9,000) / 9,000 \times 100\% = 22\%$

Price elasticity of supply =  $(22\%) / (10\%) = 2.2 > 1$  (Elastic)

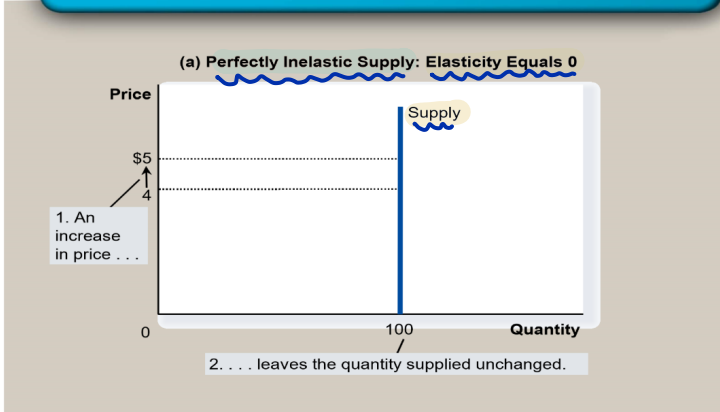
Curves

\*العزق بين Demand And supply curves

لـ Demand (نزول) ، Supply (طالع)

لـ وفي اختلاف في perfectly Elastic curve

The Price Elasticity of Supply



هذا لوجه سؤال كازم يكون مكتوب عليه supply

كانه نفس شكل Demand

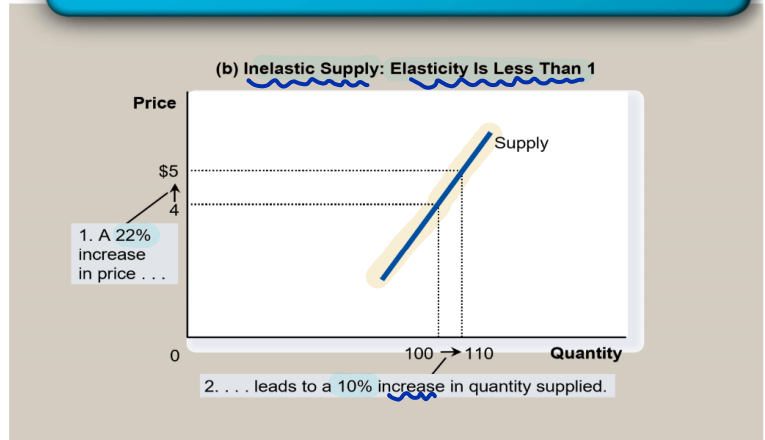
\*مسازد Price ، (unchanged) Quantity supplied

← تو طالع : Supply

← تون لن يكتب Supply/Demand

← نسبة الزيادة في price أكبر من نسبة الزيادة في supply

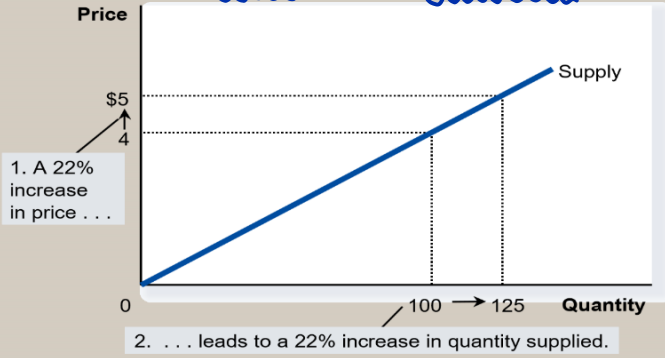
The Price Elasticity of Supply





The Price Elasticity of Supply

(c) Unit Elastic Supply: Elasticity Equals 1

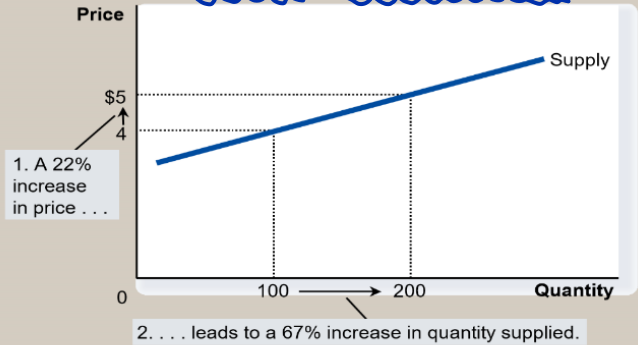


كل ما السعر يزيد بوحدة معينة

Amount supplies زياده بـ Interval ثابتة

The Price Elasticity of Supply

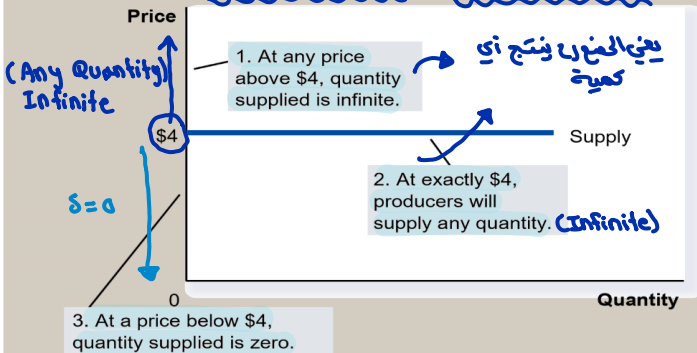
(d) Elastic Supply: Elasticity Is Greater Than 1



← نسبة زيادة Supply أكبر من نسبة زيادة Price

The Price Elasticity of Supply

(e) Perfectly Elastic Supply: Elasticity Equals Infinity



\* هون في اختلاف

\* Perfectly Elastic Demand →  $E = \infty$

Above certain price, Quantity Demanded = 0

\* Perfectly Elastic Supply →  $E = \infty$

Below certain price, Quantity Supplied = 0

كانت الكمية هون في الربح، و المستهلك هون في السعر الأقل

## TYPES OF ELASTICITY

- Elasticity is the degree of responsiveness in comparison to one variable to another variable

### TYPES

#### INCOME ELASTICITY

- Change in demand due to change in real income
- Positive – normal goods
- Negative – inferior goods

↓ Income ←

#### PRICE ELASTICITY OF DEMAND

- Tells how a change in price impacts demand
- $PED > 1$  Elastic  
 $< 1$  Inelastic

#### CROSS ELASTICITY

- Change in demand due to change in price of other goods
- +ve means close substitute

+ → Substitute  
- → Complement

#### PRICE ELASTICITY OF SUPPLY

- Tells about sensitivity of supply of product/service due to change in its market price

$PES > 1$  Elastic  
 $PES < 1$  Inelastic

اللهم نورك في  
كل خطوة نخطوها  
ولطفك في كل  
صعب أماننا  
وبركاتك في ما  
عندنا وما هو حولنا  
وما سيكون بين أيدينا

هندروز

لا إله إلا الله  
وحده لا شريك له  
له الملك وله الحمد  
وهو على كل شيء قدير

هندروز GHNDROZ