**NANYANG TECHNOLOGICAL UNIVERSITY**

**HE9091**

Principles of Economics

**Applied Economics Project**

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Article 1

Title: A Year of Disappointment at the Movie Box Office

Source: <https://www.nytimes.com/2011/12/26/business/media/a-year-of-disappointment-for-hollywood.html>

Summary

The article is about the downturn of about $500 million in total revenue of ticket sales in North America in 2011 compared to 2010, despite the increase in ticket prices of 1%. This encouraged studios to determine the primary causes and a way out of the situation as the real downturn was worse than the expected raw revenue number.

Analysis

Price elasticity of demand (symbol: ) is defined as the percentage change of quantity demanded for a 1% change in price. It is used to measure the responsiveness of the market to changes in price and therefore can be used to decide whether to increase or decrease price to maximize total revenue.

Price Elasticity of Demand are affected by several factors:

1. Substitution Options: As price increases, if there are more substitution options, rationally, people will be easier to opt for substitutes; hence, more elastic.
2. Budget Share: The smaller the goods or services took part in one’s budget proportion, the less significant the price change is; hence, less elastic.
3. Time: The longer the time to adjust, the more chance for people to explore for more substitutes; hence, more elastic

From the article, we have the data for total ticket revenue, the price per ticket, and attendance in 2011; together with their percentage change from the year 2010 to 2011.

*“With five days left in 2011, ticket sales in North America are running about $500 million behind last year — despite higher prices — “*

*“Over all, North American ticket revenue for 2011 is projected to be about $10.1 billion, according to Hollywood.com, which compiles box-office data. That is only a 4.5 percent falloff from 2010.”*

*“ Theaters have also continued to increase prices for standard tickets; moviegoers now pay an average of $7.89 each, up 1 percent over last year.”*

*“Attendance for 2011 is expected to drop 5.3 percent, to 1.27 billion, continuing a slide.”*

Hence, we can calculate the estimated values for the year of 2010 using the known information as shown in Table 1.

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2010 | 2011 | % Change |
| Total Ticket Revenue | $10.6 B | $10.1 B | -4.5 |
| Price per ticket | $7.81 | $7.89 | 1 |
| Attendance | 1.34B | 1.27B | -5.3 |

*Table 1*

*Note: Total Ticket Revenue value not exactly equal to Price per ticket x Attendance due to rounding and estimation, even for the year 2011, which are the given data.*

Being one form of entertainments, movie theatres have some substitutes, one of which is video games. As being said by Dan Fellman, president of domestic distribution for Warner Brothers, he had witnessed younger consumers opted for other recreational activities over watching movies.

*“There may be a correlation to the recent strength of video game sales,” he said. “You look at a game like the new ‘Call of Duty’ selling $400 million in its first 24 hours and say, ‘What? How is that even possible?’ ”*

As being said as well by studio executives, they have to compete for the leisure dollars, especially among young people with limited financial resources. The rise in plenty of choices of family movies and another more affordable form of recreations also strengthens the competition.

With teenagers as the most targeted consumer for many studios, it is important to ensure that it economically fits for the adult in the first place, since teenager has less disposable income, which means it takes a greater share of their budget.

Assuming prices of other leisure activities (video games, other forms of movies, etc.) do not change throughout the year, the income of the people do not vary throughout the year, the trend does not change, and no inflation occurs throughout the year, hence, from the Table 1 above, we can calculate the price elasticity of demand, using 2010 as the starting point and using the midpoint formula.

Let P be the Price per ticket and Q be the Attendance.

Start at 2010:

Using the midpoint formula:

We can see that the demand for movie tickets is elastic since the absolute value of the price elasticity of demand is greater than 1.

Due to the elastic demand, the rise in price leads to a drop in total revenue as shown in Table 1.

Line chart

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*Figure 1*

We know that

At the midpoint , the absolute value of price elasticity of demand is 1. When P is higher and Q is lower, then is higher, so . Conversely, when P is lower and Q is higher, then is lower, so .

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*Figure 2 Figure 3*

The area under the Price-Quantity graph is the total revenue. Total revenue is the highest at the midpoint, Price = and Quantity = , as shown in Figure 2 and Figure 3; therefore, when the demand is elastic, it is best to decrease the price (to increase quantity) to maximize total revenue.

Article 2

Title: EU to offer billions of funding for electric battery plants

Source: <https://www.ft.com/content/097ff758-cec3-11e8-a9f2-7574db66bcd5>

Summary

The article describes the important role of the electric battery industry in order to be advanced in the electrical industries, which was perceived as the future, as stated by Maros Sefcovic, energy vice-president at the European Commission. However, there existed positive production externalities in local electric battery markets in the EU countries that led the local electric battery industries to produce less than the social optimum. It was then a good strategy to apply funding to shift the private marginal cost to equalize the social marginal cost and to maximize the welfare of the society.

Analysis

Externalities refer to external benefits or loss incurred by outsiders which are not a participant of the market (buyer and seller). Normally, we assume that a market demand curve represents the benefits enjoyed by the consumers and the supply curve represents the cost incurred by the producers. However, externalities might occur and if no correction is done, there might be a deadweight loss to society, i.e. there will be unutilized surplus and hence, the market will not work efficiently as there is cash left on the table.

Denoting Marginal Cost as MC and Marginal Benefit as MB, then on overall, there are 4 basic externality theories [1]: Positive production externality, Positive consumption externality, Negative production externality, and Negative consumption externality. In this case, it is the positive production externality that influences the electric battery market in EU countries.

Positive production externality happens when a firm’s production generates external benefits to non-market participants, but the cost of production is not compensated by those non-market participants. Example: Honey producers with their beehives that benefit pollination and hence improving agricultural output in the vicinity.

If we express positive production externality graphically, the Social MC (Marginal Cost) curve lies below Private MC (Marginal Cost) curve as the externality is associated with producing a good and not consuming a good; hence, not shifting the MB (Marginal Benefit) curve. Note that positive consumption externality that will result in Private MB lower than Social MB [1].

In the article, local electric battery market was experiencing positive production externalities, as the local electric battery industries did not capture the benefit that EU countries would experience if they were advanced in the mass market of electrical vehicles due to the improvements in electric battery industries. What the local electric battery industries considered was just to what extent of quantity must they produce to maximize their own profit.

In equation it can be stated as:

Produce more if: MB > Private MC

Stop produce if: MB = Private MC

Produce less if: MB < Private MC

As local electric battery industries were not compensated for the benefit that it brought to the EU countries if they produced more, then for some quantity, the private marginal cost of producing that quantity would be higher than the social marginal cost. Another way to look at it is the local electric battery industries will produce more (and hence shifting the Private MC towards Social MC) if EU countries give compensation to those industries for the external benefits they generate.

From Figure 1, we can see that private optimum quantity (QPVT) is lower than the social optimum quantity (QSOC) and so, the local electric battery industry was underproducing. To easier analyze the consumer surplus, producer surplus and total (producer +consumer) surplus, we can denote areas under the graph using alphabets as in Figure 1. We also use a comparison of total welfare of society when positive production externalities exist and when it does not, using total surplus and see whether there is cash left on the table or not.

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*Figure 1*

If there are no positive production externalities, Private MC = Social MC, then P = PSOC, Q = QSOC. If there are positive production externalities, P = PPVT, Q = QPVT. Note that we can analyze the social and private economic surplus at each of QPVT and QSOC.

We know that:

Social ES (Economic Surplus) = Total social benefits – Total social costs   
Private ES (Economic Surplus) = Total private benefits – Total private costs   
Welfare = Total ES currently (at QPVT) – Total ES in the most optimum situation possible (at QSOC)

At QPVT, Social ES = (A+B+C+E+F+H+I) – I = A+B+C+E+F+H  
 Private ES = (A+B+C+E+F+H+I) – (C+F+H+I) = A+B+E  
At QSOC, Social ES = (A+B+C+D+E+F+G+H+I+J) – (I+J) = A+B+C+D+E+F+G+H  
 Private ES = (A+B+C+D+E+F+G+H+I+J) – (C+D+F+G+H+I+J+K) = A+B+E-K

|  |  |  |
| --- | --- | --- |
|  | Social Economic Surplus | Private Economic Surplus |
| QPVT | A+B+C+E+F+H | A+B+E |
| QSOC | A+B+C+D+E+F+G+H | A+B+E-K |
| Welfare | - (D+G) | +K |

We can see from the result above that companies will produce at QPVT rather than at QSOC as their welfare is maximized at that quantity; however, the overall welfare of society is not maximized at QPVT  as there is a surplus that is not being enjoyed by any one of the market participant, which is the area (D+G) in this case. This unenjoyed surplus is also being called the deadweight loss to society.

By funding the electric battery research, Private MC = Social MC, as for some quantity, the marginal cost of producing it will be lower than before funding is given. As Private MC = Social MC, the overall welfare of society is optimized as the funding will be incurred by the government, but it will go to the society, rather than not being enjoyed by anyone.

Generally, the government can solve externalities using two ways: command-and-control policies to regulate behavior directly and market-based policies to incentivize decisions of producers to produce more output, such as subsidy or funding [2]. In this case, however, subsidies are used rather than command-and-control policies as the subsidiary is more effective if the external benefits can be measured.

Article 3

Title: Banking Panics of 1930-31

Source: <https://www.federalreservehistory.org/essays/banking_panics_1930_31>

Summary

The article discusses a series of commercial bank crises in the U.S which initiated the Great Depression in the 1930s. First, it was mainly caused by the fictitious reserves (handing over a substantial portion of someone’s demand deposit from one to another commercial bank) which caused the unavailability of the money when all of the depositors wanted to withdraw the money from their checking account at the same time. Second, it was due to the inability to liquidize the bank reserves during the crisis which was a consequence of the former. Lastly, it was strengthened by the collapse of Caldwell, the largest financial holding company in the South that spread panic through the entire community.

Analysis

In this modern world, the central bank has an important role in the process of money creation. One of its roles is the ability to print money and to put them into the circulation. In the U.S, the central banking system is called the Federal Reserve System and it comprises 12 Federal Reserve Banks located in its districts. However, most of the central bank in the U.S. is pseudo-independent unlike in some other countries which are part of the government [1].

There are several assumptions that should be made when talking about money creation. It assumes people will deposit all of their money (no money held in cash) and banks will lend out all of the permissible amounts of money to be lent (deposit amount – reserve requirement) such that are no excess reserves. People who loan money from the bank are also assumed to directly spend all of the loans to someone else. However, some or all the assumptions might not always be the case [2].

In reality, it is more common to have people still holding cash than put it all in the bank. Commercial banks also rarely loan all of the permissible of money to be lent and not holding excessive amount of reserves as the amount of lending will depend on the most profitable lending opportunities available, that depends heavily on the interest rate set by the central bank. But this grant, even not so accurate, an explanation of how money expands or virtually created in the society [3].

Let Central Bank prints $100 and the reserve requirement ratio is 10%, then on overall, if we use the assumption of money creation theory, then the steps of money creation includes:

1. Central Bank prints $100 may it be physically or digitally.
2. The purchase of securities by central bank so that all of the $100 money gets into the circulation for the first time to the first commercial bank by a depositor which is the seller of the security from which the central bank buys the security from.
3. The first commercial bank lends out all of the permissible amounts of money to be lent (90% x $100 = $90) to another person and this another person will put all of the money in the same or different commercial bank (same or different commercial bank will not affect the money creation process if the commercial bank lends out all of the permissible amounts of money to be lent)
4. The $90 money loaned will all be deposited again in the bank and all of the permissible amount of money to be lent (90% x $90 = $81) will be lent to another person and all of the $81 money loaned will be deposited again into the second commercial bank.
5. This process goes on and we can see that this is an infinite geometric series to calculate the money in the economy now.

*Note that the underlined word all can be replaced as “some” to fit the reality. But we can see that regardless “all” or “some”, the amount of money in the economy increases from its initial value.*

Initially, there is just $100, but now, assuming people will not take all of their money simultaneously, there is $100 + $90 + $81 + $72.9 + … money in the economy. With the initial value and initial ratio , we can calculate this infinite geometric series using the formula

We can see that = = . People then used the term money multiplier which, by definition, is the multiplier to which the initial amount of money multiplied with, to get the theoretically amount of money in the economy after the money creation process.

Let denote the money multiplier and be the initial amount of money printed by the central bank, then the total of money in the economy after the money creation process is   
with . In the example above, the money multiplier is 10x.

Due to the recession in the U.S. in the 1930s, the aggregate demand decreased which results in the decline in the price of stocks as companies struggled to sustain profitability [4]. Caldwell, at that time, was the largest financial holding company in the South. It provided wide financial services such as banking, insurance, and brokerage. The leaders of Caldwell invested too heavily in stocks and as the prices of stocks declined, they drained cash from their corporations to cover their losses, may it be from Caldwell’s subsidiaries or affiliates. This forced the leaders of Caldwell to suspend their commercial banks’ operations, i.e. closed the banks, and in the areas in which the bank was closed, panics were created, and this panic spread from town to town.

People then rushed to withdraw their money from the banks as they were afraid that the banks at which they put their money might be bankrupt subsequently. As banks were mostly only had cheques instead of real physical money (due to the assumption of people will not take their money simultaneously), bank runs happened, and the central bank had the obligations to prevent or to overcome this bank panics.

Central banks in different districts had a different perspective on what their responsibilities were. Two districts, Sixth District (which headquartered in Atlanta) and Eighth District (which headquartered in St. Louis) were one example of two districts with a totally different reaction to the crisis. The Atlanta Fed promoted discount lending to member banks (banks that are part of the Federal Reserve System) so that member banks extended loans to non-member respondents to supply money to towns struck by crisis. However, St. Louis did the otherwise. St. Louis Fed limited discount lending and refused to help non-member respondents.

The outcome, therefore, differed as expected in these 2 districts. In the Sixth District, lending from the central bank to commercial banks increased, the money supply increased (Figure 1a), nominal interest rate decreased (which is equal to the real interest rate in the very short run as inflation changes relatively slowly in the short run), aggregate demand increased (Figure 1b). Hence, Economic recession began to slow down, and this led to the passing of the trough in the business cycle which then led to recovery.

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*Figure 1a Figure 1b*

In the Eight District, however, lending declined, money supply decreased (Figure 2a), the nominal interest rate increased, aggregate demand decreased (Figure 2b). Added with the Keynes’ argument that when demand power is very weak during a very poor business condition, the overall expenditure and employment will decrease even more and the economy will not get back to its potential output by self-correcting mechanism (increase aggregate supply in this case) and this brought to the Great Depression [5]

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*Figure 2a Figure 2b*

These banking crises generated adverse effects on the national economy. People were then convinced to hoard cash and bankers to have excess reserves and not loaning all the permissible amount of money to be lent. This then led to a decline in money supply (Figure 2a), increased interest rates, decreased consumption, and expenditure, and hence, decreased aggregate demand in the economy (Figure 2b). This deflation forced banks, firms and companies into bankruptcy, inclination in unemployment and a fall in purchasing power in the economy.

The deflation finally ended due to the Roosevelt administration’s recovery programs, one of which included the creation of deposit insurance under Federal Deposit Insurance Corporation (FDIC). FDIC provides deposit insurance to restore trust in American banking society as a response to the bank runs in the past [6].

Article 4

Title: The Great Inflation 1965-1982

Source: <https://www.federalreservehistory.org/essays/great_inflation#high>

Summary

The article talks about the overheating in the U.S. economy due to the assumption that lower rate of unemployment could be “bought” by having a modestly higher interest rate, exacerbated by 2 huge energy crises in 1973 and 1979, which led to great inflation from 1965-1982, and finally cooled down by the end of 1982 with the inflation rate went back to its normal rate, around 2-3% [1]. The cooling down of the economy was during Paul Volcker administration in the Federal reserve by fighting inflation using high-interest rate.

Analysis

The U.S was facing a weak economy in 1960 under Eisenhower administration and some referred it as the recession. There has been a debate whether it was due to the government or was just a natural fluctuation of the business cycle. This was one of the factors that supported the fall of Eisenhower and shifted to John F. Kennedy in 1961. The U.S. economy improved a lot under John F. Kennedy administration by implementing Keynesian Model with goals to increase the GDP and employment while keeping inflation low [2].

Keynesian Model is a theory developed by a British economist named John Maynard Keynes during the Great Depression in the 1930s. It was about his thought that Great Depression was countered the classical theory that the economy, which was in recession at that time (Y1, π1), would return to its most optimal state by its own, as businesses and investors would take advantage of the low prices by investing and employing more employees, which would shift the short-run aggregate supply curve SRAS1 to SRAS2 and brought the economy back to its optimal output with lower inflation rate (π2) as shown in Figure 1a [3].

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*Figure 1a: Classical theory Figure 1b: Keynesian Model*

Keynes argued that during the recession, the economy will worsen, i.e. it is not going to back to its natural level of output by its own. When the economy is weak, companies will opt for reducing its capital investments instead of taking advantage of the low prices in investing in new plants and equipment. Businesses will also reduce its number of its employees amidst the poor business condition instead of employing more employees. These will reduce overall expenditure and employment and the country will suffer a worse recession.

Therefore, Keynes suggests the government implements countercyclical fiscal policies to shift the aggregate demand curve AD1 to AD2 and stabilize the economy as shown in Figure 1b [3].

During Lyndon B Johnson administration starting from 1963, the economy was already running at its full potential (Y\*, π1), but the government did not hold back its spending, transfers, tax cut, and even with the Vietnam war, it caused firms to employ more people in the country to produce military equipment for the war, increased government spending to pay soldiers and military equipment and therefore the aggregate demand curve shifted even more to the right from AD1 to AD2 as shown in Figure 2a. This led to the beginning of the great inflation.

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*Figure 2a Figure 2b*

When the economy was producing beyond its potential output with the higher inflation rate, workers would rationally renegotiate their wages to be higher, then the firms would employ less worker, produced less output, the short-run aggregate supply SRAS1 would shift to SRAS2. This brought back the economy to its potential output with a higher inflation rate than its initial (π3) as shown in Figure 2b.

But the story did not end here. There were 2 remarkable energy crises, the Arab Oil Embargo in 1973, that quadrupled the price of oil to a plateau, followed by the Iranian Revolution in 1979 that brought the second energy crisis that tripled the price of oil. This inflation shocks shifted the short-run aggregate supply SRAS2 to SRAS3 as shown in Figure 2c. This led to stagflation (inflation with stagnant economic growth). The rate of both unemployment and inflation was unacceptably high at this time, which ranged from 4.9% to 8.2% for unemployment [4] and 5.76% to 13.5% for inflation [1].

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*Figure 2c*

In 1979, Paul Volcker became the chairman of the Federal Reserve Board and he realized that managing the money supply through controlling the reserve and money growth could slow down the inflation. So, he fought inflation at that time by maintaining high-interest rates. This affected the saving decisions of household, i.e. people will have more saving which means less consumption. Firms would also hold back their investments when interest rates were high as the cost of borrowing was increasing. So, the aggregate demand curve shifted from AD2 to AD3 as shown in Figure 2d.

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*Figure 2d Figure 2e*

This decision brought a higher rate of unemployment, but this turned out that in the long run, people would be willing to get a job with lower wages rather than being unemployed at all, thus the economy would do the self-correction and shift the short-run aggregate supply SRAS3 to SRAS1 as shown in Figure 2e. It may take time, but the economy was going back to its potential output as shown by the end of the Great Inflation by November 1982, which inflation rate was just 2-3% from that time.

The fact that the economy will do the self-correction to go back to its full potential output must be distinguished with Keynesian thought during Great Depression in the 1930s as Great Depression was just a special circumstance in which stimulus was also needed on the demand side instead of on just the supply side. During the Great Depression in the 1930s, businesses and investors did not want to employ more employees or invest in new plants or investments due to the very poor business condition and the very weak demand. Some called this as sticky prices and AS curve seemed as if it was flat in the very short run; therefore, the only way to bring back the economy to its full potential was by countercyclical fiscal policy or monetary policy [5].

Instability of U.S economic situation from 1960-1982 had brought a huge transformation in macroeconomic theories and important lessons. Firstly, implementing time-consistent policies (policies that are not sacrificing long term prosperity just for short term gains) are very important. In this case, the trade-off between unemployment and inflation rate is unstable as in the long run, the economy will go back to its optimal rate of unemployment and leads to a higher inflation rate. Secondly, if the economy takes a long time to adjust to its full potential output, then stabilization policies, may it be government intervention through countercyclical fiscal or monetary policy, will be effective to close the output gap; but if the economy can return to its potential output quickly, stabilization policies may be destabilizing.

Conclusion

By working on this final project, I am enabled to perceive the concepts taught during lectures not as it is, but as useful ideas that can be applied in real life. Many economic problems happened in daily life and after having lots of economical foundations intercorrelated to each other, now I can better see the problem as a bunch of economic disruptions correlated to each other and solutions to the problems can be proposed using the concepts taught or even with solutions that have been proposed in accordance to major economic events in the past.

Directly, the project drives me finding major economic events and news, understanding the main causes, analyzing the best solutions to the problems (from government or individual) together with the side effects, what to do during bad economic situations such as during this Covid-19 Pandemic, and what moves can be performed before or after the bad economic situation in the future. Subsequently, by figuring out what happened in the past and the solutions to it, a prediction could be made about what the government, firms, or other individuals will do in the future so that I can take better prior steps.

Indirectly, the struggle in the process of making this project, such as searching for a good article, to which critical and deep analysis can be made, also drives me to read lots of other economic articles as a comparison. After further research, finally, the best articles that can be deeply analyzed then can be opted. Throughout this time, I gained a lot more knowledge beyond what is taught during lectures, such as the Philips Curve, consumption and production externalities, charitable deduction, mortgage interest deduction, tax bracket system in the U.S., tax cut difference for earned income and unearned income, stock buyback, the combination of monetary and fiscal policy to handle a country’s economy, monetary reform, what to do as a participant in the bond and stock market in response to government or central bank policies, and what to consider as an investor.

In the future, after being equipped with basic economic principles through HE9091 lectures and this project, hopefully, I will be able to apply those concepts when facing various economic situations, both in micro and macro perspectives. As with my first intention of taking this course, which is to get basic foundations of economic before facing more complex economic problems, I am fulfilled with having this project as part of the course as it helps me connect real-world issues with what has been taught in lectures. This will help me in studying economics afterwards, especially in finance sectors which include corporate finance, risk management, financial institutions, and investments. After a while graduated from NTU, I might start my own business or stock trading or participate in the bond market, and with the basic key concepts taught by now along with my future study on economics, I will be able to understand how the world is working systematically and therefore be more prepared.

Reference

Part 1

* Article source:

B. Barnes. “A Year of Disappointment at the Movie Box Office.” A Year of Disappointment for Hollywood – The New York Times. <https://www.nytimes.com/2011/12/26/business/media/a-year-of-disappointment-for-hollywood.html> (accessed Nov. 26th, 2020)

Part 2

* Article source:

R. Toplensky. “ EU to offer billions of funding for electric battery plants.” EU to offer billions of funding for electric battery plants | Financial Times. <https://www.ft.com/content/097ff758-cec3-11e8-a9f2-7574db66bcd5> (accessed Nov. 17th, 2020)

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* Article source:

G. Richardson. “Banking Panics of 1930-31.” Banking Panics of 1930-31 | Federal Reserve History. <https://www.federalreservehistory.org/essays/banking_panics_1930_31> (accessed Nov. 16th, 2020)

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Part 4

* Article source:

M. Bryan, “The Great Inflation 1965-1982.” The Great Inflation | Federal Reserve History. <https://www.federalreservehistory.org/essays/great_inflation#high> (accessed Nov. 10th, 2020)

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