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Uses of Dynamics of Market Price Functions in Products of Nepalese Market: A Review

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Abstract

In this assignment, we addressed the usage of dynamics of market price function in 5 competitive products of Nepalese market which are handicrafts, tea and coffee, herbal products, honey and agricultural products. The purpose of the study is to identify and analyze the market price dynamics of various products traded in the Nepalese market. This research method is entirely based on literature review. The following are the steps that will be taken: identification and search of literature, literature selection, literature analysis and synthesis, and conceptual framework. This article has applied differential equation to find the change in demand and supply due to fluctuation of price. As well as the speed with which Price adjusts towards its equilibrium value is also shown in this research paper. the utilization of the market price dynamics function in the Nepalese market has a very important role. Market players, both producers, traders, and consumers, can use information about market price dynamics to make better decisions regarding production, trade, and consumption.

Keywords: Demand, supply, market, price.

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Introduction

Dynamics of market price functions (dynamic analysis) refers to the study of how market prices evolve and change over time due to various factors that influence supply, demand, expectations, and external shocks (Kopalle et al., 2023; Dokas et al., 2023; Shah & Asghar, 2023). This type of analysis focuses on understanding the processes and mechanisms that drive price adjustments in the market, rather than just the equilibrium price at any given point in time. In a market, prices are typically determined by the interaction between supply (how much producers are willing to offer) and demand (how much consumers are willing to purchase. When supply and demand are balanced, a market reaches equilibrium—the price at which the quantity supplied equals the quantity demanded. However, this equilibrium price is not static. Over time, external factors such as changes in consumer preferences, technological innovations, government policies, and unforeseen events (like natural disasters) can shift supply and demand, causing prices to adjust. Dynamic analysis studies how these adjustments occur.

In the short run, markets may face rigidities or delays in price adjustments. For instance, producers might not be able to instantly increase supply in response to a price increase, leading to temporary price spikes or shortages. Over the long run, however, markets tend to adjust more fully, with producers entering or exiting the market, investments in new technology, and changes in consumer behavior. The long-run dynamics focus on how prices eventually return to an equilibrium state after all adjustments have been made. Any sudden change in supply or demand, such as a new product introduction, a change in consumer tastes, or a supply disruption, can cause prices to fluctuate. For example, a drought may reduce the supply of crops, pushing prices up temporarily. The expectations of consumers and producers about future market conditions can have a significant impact on prices. If producers expect higher future prices, they may hold back supply in the short run, causing prices to rise. Likewise, consumers might buy in bulk if they expect prices to increase in the future. Government Intervention: Policies such as price controls (price floors or ceilings) or subsidies can affect how prices adjust. For instance, a government-imposed price ceiling (maximum price) on goods like fuel or rent can create shortages if the market price is below the equilibrium price (Murphy et al., 2019). In markets with monopolies or oligopolies (a few firms dominate the market), prices may be set not just by supply and demand but also by the strategic decisions of firms (Davis & Orhangazi, 2021); (Kim, 2022). The dynamic analysis of market prices here would include how firms adjust their pricing strategies over time to maximize profits, considering competitors' actions and market conditions. One of the earliest models to illustrate price dynamics, the Cobweb model shows how price fluctuations can occur due to delayed responses by producers to price signals. For instance, if a high price encourages producers to supply more of a good, by the time the increased supply reaches the market, the price may have already fallen, leading to cyclical price behavior (Weron, 2014); (Girdzijauskas et al., 2022); (Haralambides, 2019).

These models assume that agents (consumers and producers) make decisions based on the best available information and adjust their behavior accordingly. In this context, price dynamics occur not only due to current conditions but also because of the expectations about future price movements. These are sophisticated models used in macroeconomics to explain how prices and other economic variables adjust over time in response to shocks (e.g., changes in government policy, technology, or consumer preferences). DSGE models are used to study both the short-term and long-term dynamics of the economy. Some markets experience cycles where prices move in repetitive patterns over time (e.g., boom-bust cycles in commodity markets). Understanding the dynamic analysis of these cycles helps economists predict and explain periodic price changes. Dynamic analysis also looks at how volatile markets are and what drives price fluctuations. Financial markets, in particular, experience volatility due to investor sentiment, market speculation, and unexpected news. High volatility can lead to rapid price

changes in short period. Dynamic analysis helps predict how prices will evolve in the future, which is crucial for businesses, consumers, and policymakers. For example, understanding the dynamics of oil prices can help firms plan production schedules and governments decide on policy responses to inflation. The purpose of the study is to identify and analyze the market price dynamics of various products traded in the Nepalese market.

Methodology

This research method is entirely based on literature review. The following are the steps that will be taken:

Identification and Search of Literature

A systematic literature search will be conducted using academic databases such as Scopus, Web of Science, Google Scholar, and other relevant databases.
The keywords that will be used include: "market price dynamics", "Nepali market", "market price analysis", "Nepali economy", "Nepali trade", "market price function", and combinations of these keywords. The literature searched includes scientific journals, books, research reports, government publications, and other relevant documents.

Literature Selection

The literature found will be selected based on relevance to the research topic, methodological quality, and reputation of the source.
Inclusion and exclusion criteria will be set to ensure that the literature used is relevant and of good quality.

Literature Analysis and Synthesis

The selected literature will be analyzed in depth to identify trends, patterns, and key findings related to market price dynamics in Nepal.
The information obtained will be synthesized to produce a comprehensive picture of the utilization of market price dynamics function in the context of the Nepalese market.
The synthesized information will be used to see the patterns, and relationships that occur in the Nepalese market related to market price dynamics.

Conceptual Framework

Based on the literature analysis, a conceptual framework will be developed that explains the relationship between various factors that influence market price dynamics in Nepal. This conceptual framework will help in organizing the research findings and provide a basis for policy recommendations.

Results

History

The study of the dynamics of market price functions—or the dynamic analysis of how prices evolve over time—has a rich history. The concept has developed through a combination of theoretical

economics, real-world observations, and advances in modeling techniques. Below is a brief history of key milestones in the development of this area of economic thought:

1. Early Economic Thought: Classical Economics (18th–19th Century)

Adam Smith (1776) - The Wealth of Nations

- Key Contribution: The foundation for classical economics and the idea of the "invisible hand," where market prices are determined by the forces of supply and demand.
- While Smith did not directly focus on price dynamics in the way we understand today, his work laid the groundwork for future analysis by suggesting that markets are self-regulating and prices naturally adjust to equilibrate supply and demand (see [1-5]).

David Ricardo (1817) - Principles of Political Economy and Taxation

- Ricardo developed the theory of comparative advantage and explored the role of price signals in guiding production and trade. However, the dynamics of how prices adjusted over time were not his main focus.

Jean-Baptiste Say (1803) - A Treatise on Political Economy

- Say argued that supply creates its own demand (Say's Law), which led to the idea that market prices in a competitive economy will naturally adjust in the long run to the equilibrium between supply and demand.

John Stuart Mill (1848) - Principles of Political Economy

- Mill expanded on classical ideas by discussing how changes in demand and supply affect equilibrium prices, but he did not extensively explore the dynamics (time-based adjustments) of prices.

2. Marginalism and the Birth of Price Theory (Late 19th Century)

Alfred Marshall (1890) - Principles of Economics

- Key Contribution: Marshall’s supply and demand framework became the cornerstone of modern microeconomics, laying the foundation for understanding how equilibrium prices are determined.
- Marshall emphasized short-run and long-run equilibrium in markets, introducing the concepts of price elasticity and consumer surplus.
- While Marshall’s focus was primarily static (at any point in time), his work indirectly set the stage for dynamic analysis by introducing the idea that changes in supply, demand, and external conditions affect price levels over time.

3. The Cobweb Model and Early Dynamic Analysis (1930s–1950s)

The Cobweb Model (1930s)

- The Cobweb model, first popularized by Richard Goodwin in 1951 and earlier discussed by others, was one of the first dynamic models to describe how market prices and quantities adjust over time.
  - The model illustrates how prices can oscillate (rise and fall) around an equilibrium due to delayed reactions by producers. For example, if prices are high, producers increase supply, but by the time the new supply hits the market, prices might have already fallen, causing a cycle of price fluctuations.
  - Cobwebs are a classic example of a simple dynamic model showing price instability due to expectation errors or lagged responses.

Roy Radner (1952) - Dynamic Economic Models

- Radner's work introduced more formal dynamic models to economics, expanding on Goodwin's ideas. His models considered the dynamics of market equilibria in the presence of multiple agents and uncertainty.

4. Game Theory and Strategic Interaction (1950s–1970s)

John Nash (1950s) - Nash Equilibrium

- Nash's game theory introduced strategic interaction between market participants, influencing how they set prices dynamically. Nash equilibrium has become a core concept in understanding how competitive markets evolve over time, especially when considering the role of expectations and interdependent strategies of firms or consumers (Lee & Jin, 2019); (Shavitt & Barnes, 2020).

Cournot and Bertrand Models (1838–1950s)

- These models (especially the Cournot model) showed how firms set prices in oligopolistic markets, considering the dynamic reactions of competitors (Schroeder & Tremblay, 2014). The analysis evolved over time to include dynamic pricing strategies, where firms adjust prices over time based on the actions of competitors.

5. The Rise of Modern Dynamic Pricing Models (1970s–1990s)

Rational Expectations Revolution (1970s)

- Robert Lucas (1972) and others introduced the rational expectations theory, which radically changed the way economists viewed price adjustments. Instead of assuming agents had adaptive expectations (where people base future decisions on past prices), rational expectations assumes that agents use all available information to predict future prices and adjust instantly. This made models of dynamic price functions more precise and realistic in capturing real-world economic behaviors.
- The theory emphasized how prices and macroeconomic variables such as inflation, interest rates, and employment adjust dynamically in response to shocks and policy changes.

The Introduction of DSGE Models (1980s–1990s)

- Dynamic Stochastic General Equilibrium (DSGE) models became a standard tool for studying macro-level price dynamics. These models incorporate expectations, shocks (e.g., technological advancements, policy changes), and the intertemporal decisions of agents (e.g., consumers and firms).
  - DSGE models provided a framework for understanding how policy changes or external shocks affect prices over time in equilibrium.
  - Christiano, Eichenbaum, and Evans (2005) are examples of economists who refined DSGE models to better understand price dynamics in response to macroeconomic shocks.

6. Behavioral Economics and Non-Equilibrium Approaches (1990s–2000s)

Behavioral Economics (Late 1990s–2000s)

- Economists like Daniel Kahneman and Amos Tversky (1979) revolutionized economic theory by introducing psychological factors into the understanding of market behavior. Their work on prospect theory and irrational behavior led to insights on how individuals form expectations and adjust their behavior in response to price changes (Reina Paz & Rodríguez Vargas, 2023).

- This led to a new approach for modeling price dynamics, considering not just the rational actions of market participants but also their biases and emotional responses. Models based on bounded rationality and market frictions became important for understanding dynamic price adjustments in more realistic settings (Evans & Prokopenko, 2021); (Gârleanu & Pedersen, 2016).

Market Microstructure (1980s–2000s)

- Market microstructure theory, focusing on the mechanics of trading and how the design of financial markets influences price formation, became an important area of research in understanding price dynamics (Webb, 2024).
  - Researchers studied how trading volume, liquidity, and information flow affect price volatility and the speed at which prices adjust in financial markets.

7. Recent Developments and Modern Approaches (2010s–Present)

Machine Learning and Big Data

- The 2010s saw the rise of machine learning and big data analytics, which have provided new tools for understanding dynamic price movements, especially in complex and fast-moving markets like stocks, commodities, and cryptocurrencies.
  - Algorithmic trading and dynamic pricing strategies used by firms today are heavily influenced by these new technologies, which help adjust prices based on real-time data and forecasts (Dakalbab et al., 2024) (see [5-9]).

Artificial Intelligence and Predictive Models

- The use of AI models and predictive analytics has allowed for more sophisticated dynamic pricing algorithms that respond to market trends, consumer behavior, and even macroeconomic indicators in real-time.
- These tools have transformed industries such as e-commerce and airline pricing, where prices can change frequently, driven by algorithmic responses to supply, demand, and consumer behavior.

In short, The history of dynamic market price functions reflects the evolution of economic thought and modeling techniques. From the early classical economists, who laid the foundations of supply and demand, to modern DSGE models and behavioral economics, the study of dynamic prices has become more nuanced and sophisticated (Liu et al., 2024); (Tao et al., 2024); (Martinčić et al., 2022). Today, dynamic analysis is a crucial part of understanding market behavior, from short-term fluctuations to long-term equilibrium adjustments (see [10-27]).

Key Milestones:

1. Classical Economics (18th–19th century): Early ideas on supply and demand.
2. Marginalism and Price Theory (Late 19th century): Alfred Marshall's work on price equilibrium.
3. Cobweb Model (1930s–1950s): Early dynamic models explaining price oscillations.
4. Game Theory and Rational Expectations (1950s–1970s): Introduction of strategic interaction and rational expectations.
5. Dynamic Models and DSGE (1980s–1990s): More complex models of price adjustments.
6. Behavioral Economics and Machine Learning (1990s–Present): Incorporation of psychological factors and advanced technologies into price modeling.

Today, the dynamic analysis of market prices continues to evolve with advancements in technology and economic theory, providing critical insights into how prices adjust in real markets.

Definition

Demand: The quantity of a good or service consumers are willing and able to buy at various prices over a period.
Supply: The quantity of a good or service producers are willing and able to sell at various prices over a period.
Market: A system where buyers and sellers exchange goods or services.
Price: The monetary value of a good or service determined by demand and supply.

Discussion

We consider the linear demand and linear supply functions :
$Q_d = a - bp$
$Q_s = -c + dp$
If $Q_d = Q_s$ then we can easily obtain equilibrium price and equilibrium quantity. But in practice, this condition may not happen. In this case, we must say that the change in price affects Q_d and Q_s. For this, we may assume that the rate of change of price is proportional to the excess demand $Q_d - Qs$

i.e. $\frac{dp}{dt}$ $inverse\ relation\ with\ Q_d - Q_s$

i.e. $\frac{dp}{dt} = r\,(Q_d - Q_s)$

i.e. $\frac{dp}{dt} = r\,((a - bp) - (-c + dp))$

i.e. $\frac{dp}{dt} = r\,(a - bp + c - dp)$

i.e. $\frac{dp}{dt} = r((a + c) - (b + d)p)$

i.e. $\frac{dp}{dt} = r(a + c) - r(b + d)p$

therefore, $\frac{dp}{dt} + r\,(b + d)p = r\,(a + c)$

Which is a linear differential equation.
We can easily get its solution i.e. Price function.

REMARKS:

1. If $Q_d > Q_s$, $\frac{dp}{dt} > 0$ Implies P increases in order to balance demand and supply.
2. If $Q_d = Q_s$, $\frac{dp}{dt} = 0$ Implies P is constant at equilibrium point.
3. If $Q_d < Q_s$, $\frac{dp}{dt} < 0$ Implies P decrease in order to balance demand and supply.

Problem 1 :

If demand and supply functions for Tea in Nepalese market are $Q_d = 32 - 0.5P$ and $Q_s = -8 + 0.3P$ *and* the rate of adjustment of price when the market is out of

equilibrium is $\frac{dp}{dt} = 0.2(Q_d - Q_s)$. Derive and solve the obtained differential equation to get a function for P in terms of t given that price is 12 in the time period 0.

Solution 1 :

Here,

$$Q_d = 32 - 0.5P$$
$$Q_s = -8 + 0.3P$$
$$\frac{dp}{dt} = 0.2(Q_d - Q_s)$$
$$or, \frac{dp}{dt} = 0.2((32 - 0.5P) - (-8 + 0.3P))$$
$$or, \frac{dp}{dt} = 0.2\ (32 - 0.5P + 8 - 0.3P)$$
$$or, \frac{dp}{dt} = 0.2\ (40 - 0.8P)$$
$$or, \frac{dp}{dt} = 8 - 0.16P$$
$$or, \frac{dp}{dt} = -0.16(P - 50)$$
$$or, \frac{dp}{P - 50} = -0.16dt$$

Integrating on both sides,

$$\log e\ (P - 50) = -0.16t + \log eC$$
$$\log e\ (P - 50) - \log eC = -0.16t$$
$$\log e\ (\frac{P - 50}{C}) - 0.16t$$
$$P - 50 = C.e^{-0.16t}$$
$$P = 50 + C.e^{-0.16t} \quad \ldots\ldots\ldots (i)$$

By question, when t= 0, P= 12

Then from (i)

$$12 = 50 + C.e^{-0.16*0}$$
$$or, 12 - 50 = C$$

Therefore C = -38

Substitute the value of C in (i)

$$P = 50 - 38.e^{-0.16t}$$

which is the required solution.

Problem: 2

The demand and supply function of Agricultural Products in Nepali Market are $Q_d = 500 - 5P$ and $Q_s = -40 + 20P$ respectively. The initial price P_0 is Rs. 100. Derive a function for the time path P and use it to predict price in time period 5 given that the price adjusts is proportion to excess demand at the rate $\frac{dp}{dt} = 0.02(Q_d - Q_s)$. How many time periods would you have to wait for the price to drop by Rs. 40?

Solution

$$\frac{d_p}{d_t} = 0.02(Q_d - Q_s)$$

$$\text{or, } \frac{d_p}{d_t} = 0.02[(500 - 5P - (40 + 20p)]$$

$$\text{or, } \frac{d_p}{d_t} = 0.02(500 - 5P + 40 - 20P)$$

$$\text{or, } \frac{d_p}{d_t} = 0.02\ (500 - 25P)$$

$$\text{or, } \frac{d_p}{d_t} = 10.8 - 0.5P$$

$$\text{or, } \frac{d_p}{d_t} = -0.5(P - 21.6)$$

$$\text{or, } \frac{d_p}{P - 21.6} = -0.5dt$$

Integrating both sides,

$$\ln(P - 21.6) = -0.5\ t + \ln C$$

$$\text{or, } \ln(P - 21.6) - \ln C = -0.5t$$

$$\text{or, } \ln\left(\frac{p - 21.6}{c}\right) = -0.5t$$

$$\text{or, } P - 21.6 = ce^{-0.5t}$$

$$\therefore P = 21.6 + Ce^{-0.5t} \quad \ldots (i)$$

By the question, when t = 0, P_0=100

Then from (i)

$100 = 21.6+Ce^{-0.5*0}$

Or,100-21.6 = C

∴ C = 78.4

From (i) ,

$P = 21.6 + 78.4e^{-0.5t}$ … (ii)

When P = 40, from equation (ii)

$40 = 21.6 +78.4e^{-0.5t}$

Or, $40 -21.6 = 78.4e^{-0.5t}$

Or, $\frac{18.4}{78.4} = e^{-0.5t}$

Or, $e^{-0.5t} = \frac{23}{98}$

Taking ln on both sides,

$-0.5t = \ln 23 - \ln 98$

Or, - 0.5t = -1.45

Or, $t = \frac{1.45}{0.5} = 2.9$

∴ t = 2.9 time period.

Problem3:

If the demand and supply function for Yarsagumba (Ophiocordyceps sinensis) in Nepali Market are

$Q_d = 1086 - 0.00012P$ and

$Q_s = -388 + 0.00013P$ and the rate of adjustment of price which the market is out of equilibrium is $\frac{dP}{dt} = 0.32(Q_d - Q_s)$. Derive and solve the differential equation to get a function for P in terms of t given that price is 1500000/kg in time period 0.

Solution :

Here,

$$Q_d = 1086 - 0.00012P$$
$$Q_s = -388 + 0.00013P$$

$$\frac{dP}{dt} = 0.32(Q_d - Q_s)$$
$$or, \frac{dP}{dt} = 0.32\{(1086 - 0.00012P) - (-388 + 0.00013P)\}$$
$$or, \frac{dP}{dt} = 0.32\,(1086 - 0.00012P + 388 - 0.00013P)$$
$$or, \frac{dP}{dt} = 0.32\,(1474 - 0.00025P)$$
$$or, \frac{dP}{dt} = 0.32 * (-0.00025)\,(P - 5896000)$$
$$or, \frac{dP}{dt} = -0.00008\,(P - 5896000)$$
$$or, \frac{dP}{(P - 5896000)} = -0.00008\,dt$$

Integrating on both sides,

$$\log e\,(P - 5896000) = -0.00008t + \log e\,C$$
$$or, \log e\,(P - 5896000) - \log e\,C = -0.00008t$$
$$\text{or}, \log e\,\left(\frac{P - 5896000}{C}\right) = -0.00008t$$
$$or, P - 5896000 = C.e^{-0.00008t}$$
$$or, P = 5896000 + C.e^{-0.00008t} \ldots\ldots\ldots\ldots\ldots\ldots (i)$$

By question, when t= 0, P= 1500000

Then from (i)

$$or, 1500000 = 5896000 + C.e^{-0.00008*0}$$
$$or, or, 1500000 - 5896000 = C$$

Therefore C = −4396000

Substitute the value of C in (i)

$$or, P = 5896000 - 4396000.e^{-0.00008t}$$

Which is the required solution.

Problem 4:

If demand and supply functions for Thangka (cloth painting) in Nepalese market are $Q_d = 414 - 0.006P$ and $Q_s = -56 + 0.002P$ and the rate of adjustment of price when the market is out of equilibrium is $\frac{dp}{dt} = 0.25(Q_d - Q_s)$. Derive

and solve the obtained differential equation to get a function for P in terms of t given that price is 4000 in the time period 0.

Solution 4 :

Here,

$$Q_d = 414 - 0.006P$$

$$Q_s = -56 + 0.002P$$

$$\frac{dp}{dt} = 0.25(Q_d - Q_s)$$

$$or, \frac{dp}{dt} = 0.25\{(414 - 0.006P) - (-56 + 0.002P)\}$$

$$or, \frac{dp}{dt} = 0.25\{(414 - 0.006P + 56 - 0.002P)\}$$

$$or, \frac{dp}{dt} = 0.25\,(470 - 0.008P)$$

$$or, \frac{dp}{dt} = 0.25 * (-0.008)(P - 58750)$$

$$or, \frac{dp}{dt} = -0.002\,(P - 58750)$$

$$or, \frac{dp}{(P - 58750)} = -0.002\,dt$$

Integrating on both sides,

$$\log e\,(P - 58750) = -0.002t + \log e\,C$$

$$or, \log e\,(P - 58750) - \log e\,C = -0.002t$$

$$\text{or}, \log e\left(\frac{P - 58750}{C}\right) = -0.002t$$

$$or\ P - 58750 = C.e^{-0.002t}$$

$$or\ P = 58750 + C.e^{-0.002t} \ldots\ldots\ldots\ldots\ldots (i)$$

By question, when t= 0, P= 4000

Then from (i)

$$or\ 4000 = 58750 + C.e^{-0.002*0}$$

$$or\ 4000 - 58750 = C$$

$$therefore, \quad C = 54750$$

Substitute the value of C in (i)

$$or\ P = 58750 + 54750.e^{-0.002t}$$

Which is the required solution.

Problem 5:

The demand and supply function of Honey in Nepali market are $Q_d = 230 - 0.006\text{P}$ and $Q_s = -413 + 0.016\text{P}$ and price is currently Rs. 800 per kg. When not at equilibrium the rate of adjustment of price is $\frac{\text{dP}}{\text{dt}} = 0.04(\text{Q}_\text{d} - \text{Q}_\text{s})$. Derive andsolve the equation to get a function for P in terms of t .

Solution:

Given that ,

$$Q_d = 230 - 0.006\mathrm{P}$$
$$Q_s = -413 + 0.016P$$

And

$$\frac{\mathrm{dP}}{dt} = 0.04(Q_d - Q_s)$$
$$or, \frac{dP}{dt} = 0.04[(230 - 0.006) - (-413 + 0.01\mathrm{P})]$$
$$or, \frac{\mathrm{dP}}{\mathrm{dt}} = 0.04(230 - 0.006 + 413 - 0.01\mathrm{P})$$
$$or, \frac{\mathrm{dP}}{\mathrm{dt}} = 0.04(643 - 0.016P)$$
$$or, \frac{\mathrm{dP}}{\mathrm{dt}} = 25.84 - 0.00064\mathrm{P}$$
$$or, \frac{\mathrm{dP}}{\mathrm{dt}} = -0.00064(-40375 + \mathrm{P})$$
$$or, \frac{\mathrm{dp}}{\mathrm{dt}} = -0.00064(\mathrm{P} - 40375)$$
$$or, \frac{\mathrm{dP}}{\mathrm{P} - 40375} = -0.00064\mathrm{dt}$$

Integrating both sides, we get

$$\int \frac{1}{\mathrm{P} - 40375}\mathrm{dP} = \int -0.00064\mathrm{dt}$$
$$or, \log(\mathrm{P} - 40375) = -0.00064\int \mathrm{dt}$$
$$or, \log(\mathrm{P} - 40375) = -0.00064\mathrm{t} + \mathrm{c}$$
$$or, \log(P - 40375) = (-0.00064t) * 1 + c$$
$$or, \log(P - 40375) = (-0.00064t) * loge + logc$$
$$or, \log(P - 40375) = loge^{-0.00064t} + logc$$
$$or, \log(P - 40375) = \log(e^{-0.00064t} * c)$$
$$\mathrm{or, P} - 40375 = \mathrm{ce}^{-0.00064\mathrm{t}}$$
$$\mathrm{P} = 40375 + \mathrm{ce}^{-0.00064\mathrm{t}} \ldots \ldots (\mathrm{i})$$

If p=800 and t=0 then,

$$800 = 40375 + \mathrm{ce}^{-0.00064*0}$$

Or, $800 - 40375 = ce^0$

Or, -39575=c*1

C=-39575

Putting the value of C in equation (i),

$$\mathrm{p} = 40375 - 39575\mathrm{e}^{-0.00064\mathrm{t}}$$

Which is the required solution.

Conclusion

Based on the literature review that has been conducted, it can be concluded that the utilization of the market price dynamics function in the Nepalese market has a very important role. Market players, both producers, traders, and consumers, can use information about market price dynamics to make better

decisions regarding production, trade, and consumption. Understanding market price dynamics can help improve market efficiency by reducing information asymmetry and increasing price transparency. Analysis of market price dynamics can help identify factors that cause price fluctuations and develop strategies to reduce market volatility. However, there are several challenges that need to be overcome to maximize the utilization of the market price dynamics function in Nepal, including: 1.) Limited access to information: Many market players, especially farmers and small traders, have limited access to accurate and timely market price information. 2.). Inadequate market infrastructure: Inadequate market infrastructure, such as storage and transportation facilities, can hinder distribution efficiency and cause high price fluctuations. 3.) Influence of external factors: Nepali markets are vulnerable to the influence of external factors, such as climate change and global commodity price fluctuations, which can cause price instability. Therefore, a joint effort is needed from the government, market players, and other stakeholders to: 4.) ncrease access to market price information. Improve market infrastructure. Develop policies that support market stability. Thus, utilizing the dynamic function of market prices can make a significant contribution to economic growth and social welfare in Nepal. This study will present a comprehensive analysis of how market price functions operate in the context of the Nepalese market. It will provide deeper insights into the factors that influence price fluctuations, elasticity of demand and supply, and interactions between market participants in Nepal. The availability and quality of price data and market information in Nepal may be a challenge. Incomplete, inconsistent, or difficult to access data may limit the depth and accuracy of the analysis.

Conflict of interest

No conflict of interest

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