Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

DEPRECIATION PATTERNS IN THE UAE USED CAR MARKET: EVIDENCE FROM DUBIZZLE LISTINGS

Adrian Magracia Miranda [1], Dr. Ain Bemisal Alavi [2], Mary Angeleica Albaran Gella [3]

DOI: https://doi.org/10.63544/jbii.v5i6.110

Affiliations:

[1, 2] Business and Management, Bath Spa University - RAK Campus, UAE
[1] adrian.mirandabsu@gmail.com
[2] Email: ain@bathspa.ae

[3] Creative Computing, Bath Spa University - RAK Campus, UAE.
Email: angeleica.gella@gmail.com

Corresponding Author's Email:
[2] ain@bathspa.ae

Article History:
Received: 20.05.2026
Accepted: 13.06.2026
Published: 20.06.2026

Abstract

Understanding how used vehicles lose value over time is important for buyers, sellers, and dealers, yet the depreciation in the United Arab Emirates (UAE) used car market remains under-studied using real listing data. This study examined depreciation patterns across 400 Dubizzle listings all drawn from four mainstream brands: Toyota, Nissan, Hyundai, and Mitsubishi. Python (pandas, NumPy, statsmodels) with Google Colab was used for analysis and the code went through descriptive statistics, Pearson correlation, and OLS multiple regression. The approach was quantitative and cross-sectional, and the data were run through using Pearson correlation and OLS multiple regression, with price being the outcome and age, mileage, and brand as the predictors. The model showed a significant relationship ($F = 27.16$, $p < .001$) and it explained 25.6% of the variation in price ($R^2 = .256$). Age was shown to be the strongest predictor by far, as with each additional year lowering the asking price by about AED 4,263. Mileage moved in the expected direction but did not come out to be very significant ($p = .077$), which can come down to how closely it tracks age ($r = .639$). Brand differences were large. Compared to Toyota, Nissan was AED 31,070 cheaper, Hyundai AED 41,330 cheaper, and Mitsubishi AED 47,130 cheaper. Depreciation worked out to about 3.5% a year which is far below the 20% accounting benchmark. So, a five-year-old car still holds over 80% of its original value. For buyers: age matters most, then brand. Toyota holds value best; Mitsubishi saves you the most upfront.

Keywords: Depreciation, Used Cars, Hedonic Pricing, Residual Value, UAE, Dubizzle.

1. Introduction

The UAE used car market is said to be valued at around USD 18.39 billion in 2024 and is expected to reach USD 32.03 billion by 2029 which shows an annual growth rate of roughly 11.73% (Research and Markets, 2024). This growth is shown to be caused by a large population of expats at close to 88% of residents who stay for 3 to 5 years, resulting in the market becoming steady and having high-turnovers in the flow of vehicles. An online marketplace like Dubizzle has become one of the main ways vehicles are bought and sold, which generates a huge volume of pricing data that anyone can see. Still, there won't be full transparency on price and buyers will face an information imbalance against dealers who hold better knowledge of true market value (Ke et al., 2025). UAE used car buyers usually lack a benchmark that will help them judge whether an asking price truly reflects the vehicle's age, mileage, and brand. There is international research that has consistently shown these three characteristics as the main predictors of used car value (Prieto et al., 2015;

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Hendry, 2025), but there are few, if any, empirical studies that have tested whether the same relationships will hold and to what extent in a UAE context. Without any reference based on data that buyers can use so they cannot reliably assess the fair value and face an information gap that was described by Ke et al. (2025).

This study will tackle unanswered questions by measuring how age, mileage, and brand relate to the used car prices in the UAE and will also compare the observed depreciation rate against the normal straight-line depreciation benchmark of 20% annually. These are the objectives: (1) review literature on depreciation methods and used car evaluation, (2) collect samples of used car listings from Dubizzle across major UAE brands, (3) map out the relationships between age, mileage, brand, and price using regression, (4) compare the observed depreciation rate in this study against the straight-line rate, (5) translate the results into useful advice for buyers.

1.1 Research Questions

As a result, this study will be built around one research question and four supporting sub-questions:

Main RQ: What depreciation patterns can be observed in UAE used car prices using Dubizzle listings?

Sub-questions:

- RQ1: How does age affect selling price?
- RQ2: How does mileage affect price?
- RQ3: Do different brands show different depreciation patterns?
- RQ4: How do observed patterns compare to straight-line theory?

1.2 Significance of the Study

This study will contribute in a theoretical and practical way. First, theoretically, it will offer early evidence on how the vehicles actually depreciate in the UAE and it will test whether the standard depreciation methods match what the UAE market actually shows, expanding on the conceptual framework of Arata and Hokari (2025) and Ben-Shahar and Sulganik (2008) in a Gulf setting. Then, practically, it gives buyers a benchmark when evaluating asking prices and it gives dealers a data-driven view on how well each brand holds its value.

The study contributes on two fronts. Theoretically, it provides early empirical evidence on how vehicles actually depreciate in the UAE and tests whether textbook depreciation methods align with observed market behaviour, extending the conceptual work of Arata and Hokari (2025) and Ben-Shahar and Sulganik (2008) to a Gulf setting. Practically, it offers buyers a benchmark for evaluating asking prices and gives dealers an evidence-based view of brand-level value retention. The scope was deliberately bound to private-seller listings of GCC-specification vehicles manufactured between 2015 and 2025, across Toyota, Nissan, Hyundai, and Mitsubishi.

2. Literature Review

2.1 Theoretical Foundation

Depreciation is when an asset's value falls over time, and is usually caused by wear, usage, and time passing. There are two ways to think about this and they do not always agree with one another. First, there's the accounting view, this is where depreciation is a method of allocating the cost of an asset over its useful life (IAS Plus, 2026; Vipond, 2019). Under the straight-line depreciation method, this is the most known approach, where value decreases by a fixed amount each year no matter how the vehicle is used, which gives us a simple point to compare against (Vipond, 2019). Another method is the double declining method, with the larger loss dropping first and the smaller ones later, a shape that fits to a common observation where the car loses 15 to 30% of its value within the first year of its life and then slows down over time (Arabian Business, 2020). Scholze and Wielenberg (2007) have argued that these faster methods should better reflect how an asset is worn down, and then Arata and Hokari (2025) and Ben-Shahar and Sulganik (2008) lay out the conditions where a depreciation method is consistent or fair. There's something that none of the accounting treatments do, which is to test their assumptions against prices cars actually sell for, which is the gap that this study works in.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Secondly, there's the market view, which is explained by the hedonic pricing theory. Lancaster (1966) argued that buyers will value goods for their core features. Then another study by Rosen (1974) showed that prices of different goods are the sum of the implicit prices buyers place on each of their attributes. Furthermore, a study done by Griliches (1961) was the first ever to test on actual cars by using real price changes separated from quality-driven change. For a used vehicle, this means that price can be seen as an observed factor because of age, mileage, and brand. All these relationships can be estimated through regression. This study uses that hedonic framework to test the extent of how accurate the accounting benchmark being used in UAE is.

2.2 Age and Used Car Price

A study in the French market was done by Prieto et al. (2015) where age, mileage, and engine power were considered as variables and the overall result showed that it explains a huge part in the price variation. And Akay et al. (2018) did a study in Istanbul, and the result considered age as one of the strongest predictors. And it makes sense because as a vehicle naturally ages, things will wear down, technology will date, and the useful life will reduce, and all these will lower what a buyer will pay. Production year came out as one of the biggest price factors in a study by Erdem and Şentürk (2009) in which they used a hedonic model on 1,074 Turkish cars. And Balce (2016) backs the claim of the production year being an important factor in a Turkish e-market.

However, when a decline played out disagreement grew between multiple studies. Starting with Prieto et al. (2015) showed that the age and price relation is uneven and non-linear because in the early years value drops fast and then easing out over time. This is worth keeping note of because it uses a linear model since it's easier to interpret and therefore will capture the average yearly drop rather than a curving one. That choice is pointed out as a limitation. It is worth mentioning that the specific annual price loss caused by age has hardly ever been measured for the UAE, where the average car on Dubai roads is around eight years old (Arabian Business, 2020). This motivates H1.

2.3 Mileage and Used Car Price

When it comes to mileage, higher readings usually mean more mechanical wear, higher expected repair cost, lower useful life, all of which will drop the original price down, which lines up with the units-of-production view where value loss follows usage rather than time. Mileage, though, studies don't have the same agreement as age does and the disagreement is worth looking into. A study done by Prieto et al. (2015) have mileage the second most significant predictor overall right after age, to further add up Chen et al. (2024) reported that there was a clear significant negative mileage coefficient when they ran a multi-linear regression on 2018 to 2024 data. However, there's a study that goes against these claims, Balce (2016) have found that there was no significant main effect for mileage, showing up only through its interactions with other variables, another is Gongqi et al. (2011) have shown that "underused" cars did not consistently hold their value better and this can be explained because of odometer tampering which makes the data overall less reliable. Furthermore, Hendry (2025) found something else worth taking note of, the results found that the mileage effect weakens at high readings, it shows that with each extra kilometre in the odometer it matters less because it's already high.

Each of these studies show the independent effect of mileage making it real but weak and can be easy to hide. One reason for this is because of the relationship of age and mileage overlapping one another, because older cars just tend to have more kilometres on them, and this creates multicollinearity when both of these relationships enter regression and it makes it hard to separate each one's impact. This variable is by theory important but yet usually shown to be weak statistically once age comes into the picture, it connects to what this study finds for mileage, and it has been a little explored in a UAE context. This motivates H2.

2.4 Brand and Depreciation Patterns

With brands it can tell buyers something about quality and reliability. It can show how support happens after buying a product. In the used market, buyers usually pay more to brands they actually trust because of the belief of products lasting longer and having easy maintenance which results in lower risk. There are hedonic studies that confirm that this premium is real and still shows up even after the other variables are

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

considered, starting with Baltas and Saridakis (2010) they made a pricing model specifically for cars and their features and the results showed that buyers would still pay more for certain brands even once other visible differences were controlled for, and a different study came around same researcher, Baltas, with a different co-author Giakoumaki (2023) their results shows a similar conclusion to the previous study, as brand identity explains the price differences happening showing where loyalty is strong. Some studies used residual value as data rather than price listings, starting with Gongqi et al. (2011) found that there was a large depreciation difference across different brands in China, and then Alshboul et al. (2022) identified brand being one of the five key determinants for residual-value. Furthermore, Milheiro et al. (2024) went with the demand side and it reached the same premium, showing that for luxury brands having attachments leads to satisfaction, trust, and also loyalty.

When it comes to reliability the instant assumption is brands factor in durability in price, and yet Ginter, Young, and Dickson (1987) found that it's the opposite, with the used-market data they used the results showed depreciation barely had anything to do with the how reliable the car actually was and the value seemed to lower down to demand instead, not to how dependable it actually was. This study shows it lands somewhere in between since it looked at the mainstream and non-luxury brands, this is where both explanations could apply. Interestingly, a later study built on the work of Ginter et al. using it to sort carmakers based on quality performance and placed Toyota first, Nissan second, Mitsubishi last, this order will track closely to what this study will show later. In the UAE, Toyota is the leading car brand for the reputation of having strength and durability against the desert heat, its availability on the parts and repairs, and the high retention models like Land Cruiser and Prado (Research and Markets, 2024). Not many studies have used regression to compare how the mainstream UAE brands depreciate differently. This motivates H3.

2.5 Depreciation Theory Versus Observed Market Patterns

What this study aims to achieve is to see whether the standard depreciation rate actually holds up within the UAE market. The straight-line method of 20% comes from accounting rules, used to allocate cost in a business and not to predict resale value (Vipond, 2019). There is evidence from studies that showed a slower curve decline than the benchmark suggests. There was study that took 54 different models across 30 countries and this was done by Storchmann (2004), the result showed geometric depreciation model was the one that matched the real rates pretty well and an even more interesting find is that depreciation was a lot slower in developing countries than in industrialised ones, statistically it showed 15% for the non-OECD countries and 31% for OECD ones. Another study supported the way that decline curves but from another author Yurko (2012) used an exponential function to model the used-vehicle prices and the depreciation rate result came out around 8.7% and 19% depending on the specification of the vehicle, but it consistently stayed under 20%. Furthermore, Gavazza et al. (2014), in the study's quantitative analysis that match US and French data found that buyers are willing to pay more for newer and higher-quality cars is a big part of how the used car market works, while Porter and Sattler (1999) studied 104,033 vehicle title transfers and found that the fast depreciating cars get sold and bought way more often, which connects to how depreciation rate happens in the market.

Studies in the UAE seem to point at the same direction. Arabian Business (2020) found that value of used cars went up 4% to 10% in the UAE around 2020, which is the opposite of what the standard model expects and due to the fact high expats in the UAE having huge turnovers and also the limited public transportation. And also studies have shown that the residual values in UAE and Dubai can be predicted from vehicle characteristics using machine learning but neither of the studies used observed rates against the accounting benchmark (Al Hashmi, 2025; AlShared, 2021). Huymajer et al. (2025) noted that these kinds of regression can shift results depending on which model or features you use in the study. Overall, the studies have suggested that UAE likely depreciates more slowly than what the standard theory predicts, and comparing regression-derived UAE rate against the straight-line benchmark is an underexplored field. This motivates H4.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

2.6 Research Gap

Putting all the points together there are four real gaps that stand out. Firstly, the age and price relationship has been quantified mostly within the Western and Asian markets so in UAE this field is still heavily underexplored. Secondly, mileage being weak and non-linear, studies disagree whether this variable actually explains something by itself, it's also an underexplored field in the Gulf. Thirdly, there are rarely any studies that use regression to compare how UAE's mainstream brands depreciate differently from one another and even the studies themselves showed disagreement on whether brand premium comes from reliability or does it come from reputation. And lastly, the fourth, there is rarely any study that has tested an observed UAE depreciation rate against the straight-line accounting benchmark. Overall, these four gaps showed real problems in practicality because naturally buyers will know less than dealers do and even if sites like Dubizzle put information and pricing of the vehicle (Andrews & Benzing, 2007; Ke et al., 2025), buyers still don't have a real way to judge whether the dealers asking price is fair. This study addresses these gaps using 400 Dubizzle listings.

2.7 Hypotheses

H1: Vehicle age has a significant negative effect on used car prices in the UAE.

H2: Mileage has a significant negative effect on used car prices in the UAE.

H3: Brand significantly affects used car prices, with Toyota commanding the highest residual value relative to Nissan, Hyundai, and Mitsubishi.

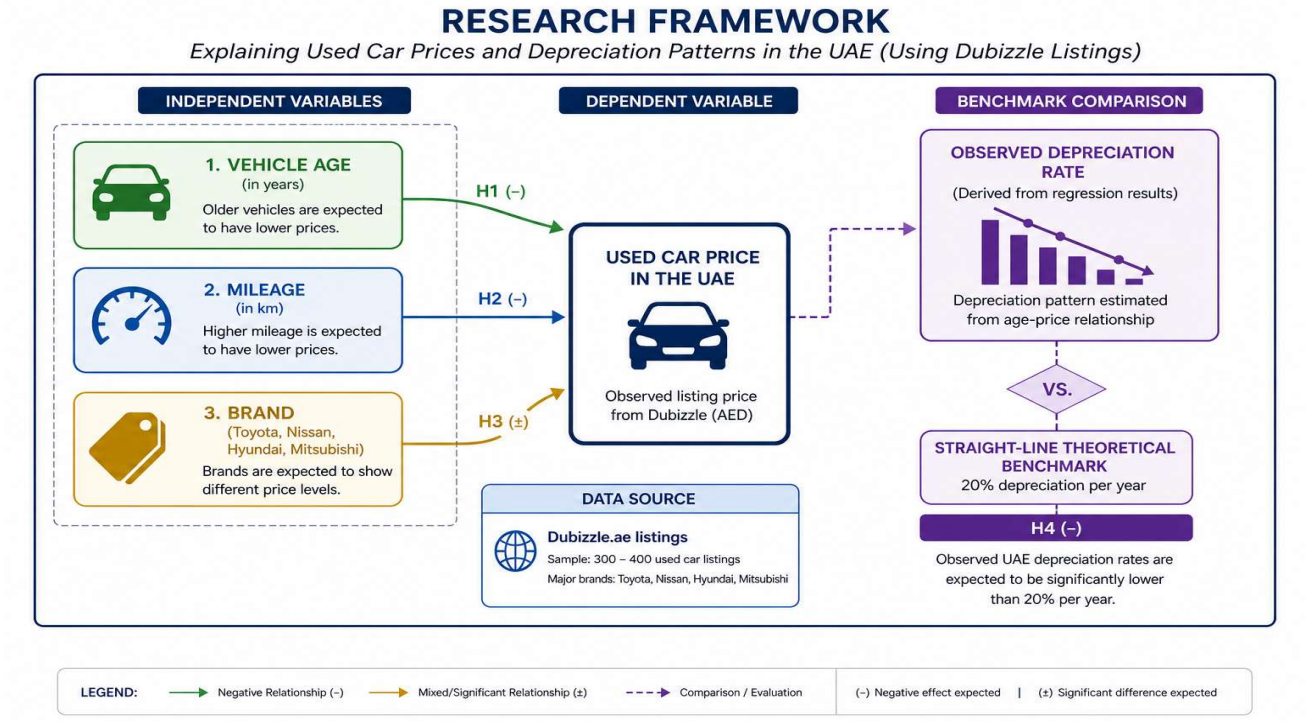
H4: Observed UAE used car depreciation rates are significantly lower than the straight-line benchmark of 20% per year.

2.8 Conceptual Framework

This study will use the theory of hedonic pricing as its main framework. Age, Mileage, and Brand will be treated as independent predictors of the price of the used car. Price will be measured in AED and this will be the dependent variable of the study. The relationships will be estimated using OLS multiple regression and will be used consistently throughout the entire study's analysis.

Figure 1

Conceptual Framework - Hedonic Pricing Model



Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

3. Research Methodology

3.1 Research Design, Philosophy, and Approach

This study will be quantitative and use a cross-sectional design, so the data collected is from a single point in time. The research will follow a positivist philosophy in which all the used car prices will be viewed as objective, measurable variable, and follow a deductive approach starting all the way from theory, followed by hypotheses, then lastly testing those hypotheses against real-world data (Saunders et al., 2019). Rather than collecting primary data by doing surveys or interviews, this study will rely on secondary data and collect from publicly accessible listings.

3.2 Population and Sampling

This study looks at used car listings from Dubizzle as its population, and it's collected from one of the online platforms that is leading in the car market scene. A non-probability quota sampling method was used when collecting all the 400 data listings from Dubizzle and it was evenly spread out 100 each to four different major brands: Toyota, Nissan, Hyundai, Mitsubishi. Choosing to balance the numbers evenly made it possible to compare each brand fairly and the listing only considered GCC-spec cars, sold privately, and the manufacturing year must be around 2015 to 2025, then mileage must have at least 10,000 km on them. Mileage was set with a limit to help filter out the unusual cases like cars that have been imported recently or just a showroom model, since the prices they sent don't truly reflect normal depreciation. These four brands were picked because they're major in the non-luxury used car market.

3.3 Data Collection

The data collection period of this study is from March to April 2026 due to the challenges faced with Dubizzle security bot protection which prevented an automated data scraper that's meant to collect and organize all listings instantly, but despite the challenge a solution was found which is to manually download them into HTML files and then with the help of Google Colab it was pasted into a built Python script that organize all the data needed for me and then was extracted into a CSV format. The variables that were taken and organized into the file are: Brand, Model, Year, Age(yrs), Mileage (km), Price (AED), URL. With the amount of manual process that needs to be done the data was limited to 400 listings to maintain consistency and data quality.

3.4 Measurement of Variables

Table 1 shows how each variable is laid out. When brand was coded Toyota was chosen to be the main reference brand, this will allow to see each brands coefficient and show how much cheaper or pricier that brand is compared to Toyota, after controlling for age and mileage. To make the mileage coefficient easier to interpret, distance was rescaled to 10,000km.

Table 1

Operationalisation of Variables

Type	Variable	Measurement
Dependent	Price	Asking price in AED
Independent	Age	2026 − year of manufacture (years)
Independent	Mileage	Total distance driven (km)
Independent	Brand	Categorical; dummy-coded (Toyota = reference)

3.5 Reliability, Validity, and Ethics

A standardized template and having an automatic data extraction helped ensure the reliability of the data. And, when it comes to validity, the main limitation comes from the study relying on asking prices than the final sale prices, and this can run a little bit higher in the outcome than what cars are actually sold for and will be noted later in the limitations. All the data used was publicly available, no personal data from sellers were kept and everything was analysed and reported as a whole, which covers the study's ethical standard.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

3.6 Data Analysis

The analysis was calculated through the use of Python (pandas, NumPy, statsmodels) with Google Colab and the code went through descriptive statistics, Pearson correlation, and OLS multiple regression. Here is how the regression model looked:

$$Price = \beta_0 + \beta_1(Age) + \beta_2(Mileage/10{,}000) + \beta_3(Nissan) + \beta_4(Hyundai) + \beta_5(Mitsubishi) + \varepsilon$$

From there, the observed annual depreciation rate was calculated using the regression intercept and age coefficient, then was later compared to the 20% straight line depreciation rate. Scatter plots with trend lines, and with P-plots, helped with showing the outcome visually.

4. Results

4.1 Descriptive Statistics

The data set ended with a total of 400 listings total, which was spread out equally to all four brands. The descriptive statistics for all the main variables will be shown in Table 2. Vehicle age showed an average of 5.68 with a standard deviation of 2.80, the median of 5 years suggests that there's a small skew pointing towards newer vehicles which is not surprising as new cars show up in Dubizzle. And then, the average asking price came out to about AED 60,096 but the standard deviation showed AED 52,001 which points to prices being so widespread, and this is mostly due to Toyota's pricier models. The average mileage came around to 101,218 km which makes sense in the market, where most people own their own car. The highest mileage recorded was 400,000 km which mostly comes mostly from Mitsubishi listings that had heavy use.

Table 2

Descriptive Statistics (n = 400)

Variable	Mean	SD	Min	Max
Age (years)	5.68	2.80	1	11
Mileage (km)	101,218	59,135	11,614	400,000
Price (AED)	60,096	52,001	12,500	379,000

Table 3 shows how the four brands compare on average prices and the ranking starts with Toyota having AED 95,193, then second is Nissan (AED 57,041), thirdly is Hyundai (AED 49,852), and lastly is Mitsubishi (AED 38,298). The median prices ended up with the same ranking. The average price of Toyota is shown to be 2.5 times more than Mitsubishi, and a reason for that gap is because of age, Toyota's car averaged 4.9 years old, meanwhile for Mitsubishi's it averaged at 6.6 years old. Overall, it shows that age doesn't explain everything and the regression in Section 4.3 pulls out the brand effect on its own by keeping age steady.

Table 3

Average Price by Brand

Brand	Mean (AED)	Median (AED)	Min (AED)	Max (AED)
Toyota	95,193	69,750	15,900	379,000
Nissan	57,041	42,500	13,500	249,000
Hyundai	49,852	44,000	14,000	149,990
Mitsubishi	38,298	30,450	12,500	109,000

4.2 Correlation Analysis

This study ran Pearson correlation on age, mileage, and price to see how each variable relates to one another and the results will be shown in Table 4. The relationship of Age and Price showed significant negative correlation showing $r = -.357$ and $p < .001$ and so did the relationship of mileage and price, $r = -.309$ and $p < .001$, this confirms that older cars and those with high mileage sell for less. Both correlations came out with the same result they were leaning on the weaker side, which means that age and mileage by themselves don't fully explain price and this is due to the fact brand and other variables weren't added in the

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

measurement and shows that it's important too. Age and mileage came out strong and positive in their correlation with r = .639 and p < .001 which finds kilometres consistently gain over time. This strong relationship shows signs of multicollinearity, meaning age and mileage share a lot of the same variance, which likely weakens how much mileage contributes independently on its own.

Table 4

Pearson Correlation Matrix (n = 400)

Variable	Age	Mileage	Price
Age	1.000	.639	−.357
Mileage	.639	1.000	−.309
Price	−.357	−.309	1.000

Note. All correlations significant at p < .001.

4.3 Multiple Regression Analysis

The OLS regression was shown to be statistically significant overall (F = 27.16, p < .001) and it explained the 25.6% price variation (R^2 = .256; adjusted R^2 = .247). The estimated model was:

Price = 123,200 + (−4,263 × Age) + (−890 × Mileage/10,000) + (−31,070 × Nissan) + (−41,330 × Hyundai) + (−47,130 × Mitsubishi)

The whole result of the data is presented in Table 5. Age was shown to be the strongest and most significant predictor (β = −4,263, p < .001) which means that each additional year that passes by reduces the asking price by about AED 4,263 once mileage and brand were held constant or roughly AED 355 a month. Mileage carried the expected negative sign but it fell a little short of the significance (β = −0.089, p = .077), which gives a price drop of about AED 890 for every extra 10,000 km. All three brand coefficients were significant and negative relative to Toyota: Nissan (−31,070), Hyundai (−41,330), and Mitsubishi (−47,130), all p < .001. And AED 123,200 is the intercept, it's basically the estimated price of a brand new Toyota and this number serves as the model's starting point.

Table 5

Multiple Regression Results (Dependent Variable: Price in AED)

Variable	Coefficient	Std. error	t	p
Intercept	123,200	6,109	12.559	< .001
Age (years)	−4,263	1,063	−4.012	< .001
Mileage (per 10,000 km)	−890	0.050*	−1.771	.077
Nissan (vs. Toyota)	−31,070	6,502	−4.779	< .001
Hyundai (vs. Toyota)	−41,330	6,422	−6.436	< .001
Mitsubishi (vs. Toyota)	−47,130	6,541	−7.206	< .001

Note. R^2 = .256; adjusted R^2 = .247; F = 27.16, p < .001. *Standard error shown for the raw per-km coefficient (−0.089).

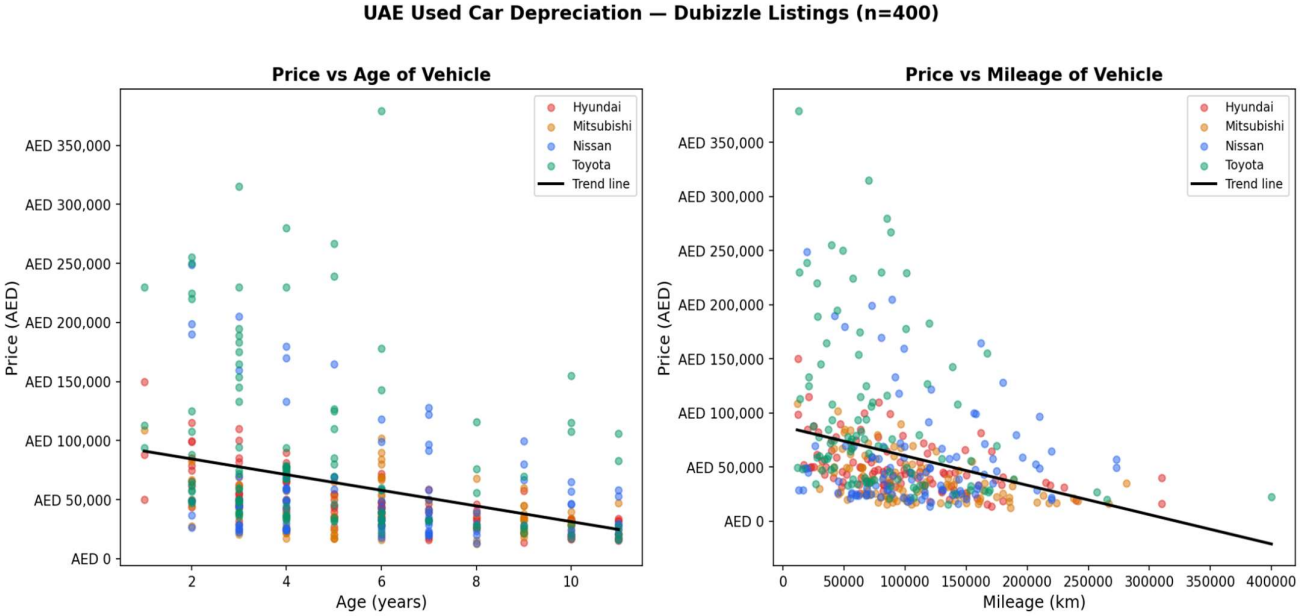
4.4 Visual Analysis

There are two scatter plots, First is, Price against Age, And Second, Price against Mileage which both is shown in Figure 2 and both are sloped downward which matches what correlation and regression showed. The age plot trend line shows a huge decline because in the first year it was AED 90,000 in value then it dropped to AED 25,000 by the eleventh year and this lines up with the estimated depreciation of AED 4,263 annually. In the data Toyota's points were consistently above every other brand and Nissan, Hyundai, Mitsubishi's data points were shown to be clustered lower down. Though when it came to the mileage plot it showed more scatter around the trend line. The mileage and price relationship was visually represented and it explains why it was weaker and more variable.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Figure 2

Scatter Plots — Price vs Age and Price vs Mileage



4.5 Comparison With Straight-Line Depreciation

To address one of the research question specifically RQ4, the results have shown the regression intercept is AED 123,200 and it was to use as the estimated new price of a Toyota and the age coefficient is -4,263 which is how much the price will drop yearly, meaning that the observed depreciation rate of about 3.5% every year. And that shows a big difference in comparison to the 20% straight-line benchmark, which means that if the car is priced 123,200 it would lose 24,640 every year and hit zero at the fifth year. Table 6 will show the predicted prices line up from both approaches across the age range in the sample.

Table 6

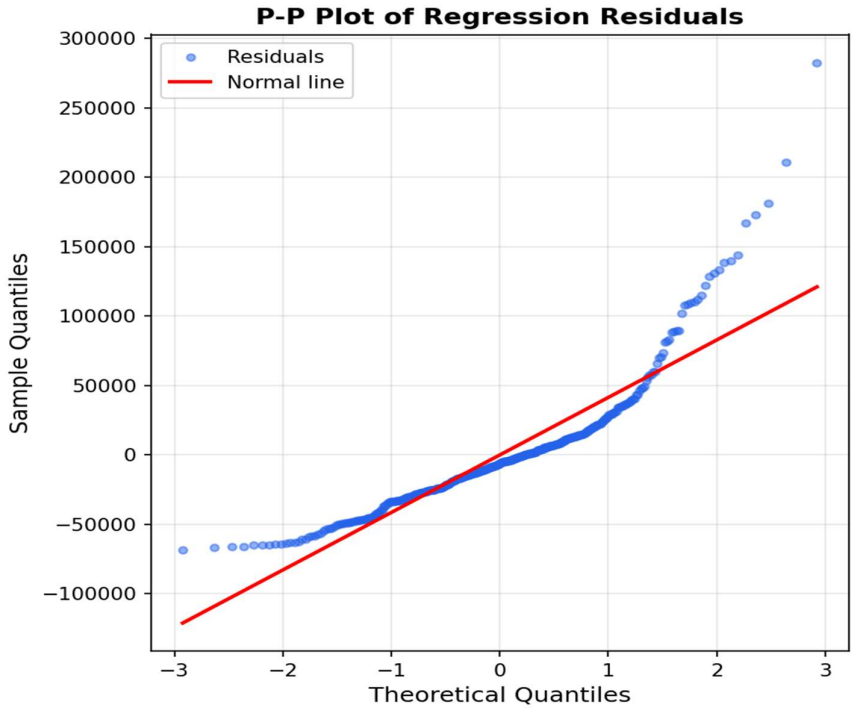
Observed Regression Price Versus Straight-Line Depreciation (Base AED 123,200)

Age (years)	Regression price (AED)	Straight-line price (AED)	Difference (AED)
0 (new)	123,200	123,200	0
1	118,937	98,560	+20,377
3	110,411	49,280	+61,131
5	101,885	0	+101,885
8	89,096	0	+89,096
11	76,307	0	+76,307

The gap shown between the two is huge and under the straight-line rule the car will be worth nothing by year five, but in the regression it says that a five year old car still holds onto about AED 101,885 which is over 80% of its estimated new value and a eleven year old car keeps around AED 76,307 which roughly around 62%. Overall, the observed depreciation goes at a very slow pace compared to the straight-line method.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Figure 3
P-P Plot (Regression Diagnostic)



5. Discussion

5.1 Effect of Age (RQ1)

Age resulted in a negative coefficient, statistics show β = −4,263 and p < .001, and this matches studies mentioned earlier done by Prieto et al. (2015) and Hendry (2025) and this takes their findings further into the UAE and it confirms that the relationship of age and price holds even here despite the market having specific changes in demand patterns. There are results that also show in international studies, First with Erdem and Şentürk (2009) they found that production year is one of the major price drivers in Turkey, and Secondly Balce (2016) found that the manufacturing year of the vehicle significantly affects prices in the Turkish e-market. Now, with this study the UAE has an actual number to show.

This study's observed rate of 3.5% is shown to be below the 15% to 30% first year drop that the UAE media usually reports (Arabian Business, 2020). The two numbers aren't fully disagreeing with one another still because the media describes a figure that will have a one time steep decline when the vehicle leaves the showroom, meanwhile this model tracks slow yearly depreciation once the car is already in the used market.

As a car gets older each year this will take off AED 4,263 from the asking price or AED 355 monthly, and this gives buyers an objective way to judge whether the resale price is actually fair. This helps close an information gap mentioned by Ke et al. (2025) directly. H1 is supported.

5.2 Effect of Mileage (RQ2)

The result of mileage came out as expected which showed up negative, because the statistics showed β = −0.089 and p = .077 meaning it didn't reach the significance level of 0.05, and H2 is rejected. A study found mileage resulted in a significant negative coefficient done by Chen et al. (2024), then another study found that mileage showed no effect at all unless it was through relationships with other variables and this was done by Balce (2016), this is a pattern that was observed and it closely matches what came out here.

There are three different reasons behind this result. Firstly, multicollinearity, because age and mileage relationship is strong and statistics backs this with r = .639, and when age soaks up most of the time-related decline that's when mileage doesn't have much left to work with, Secondly, measurement reliability, a study mentions that odometer tampering can be a problem as it weakens the real relationship this was done by

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Gongqi et al. (2011), And for last Thirdly, non-linearity, a study done by Hendry (2025) found that mileage will matter less as readings get higher in the odometer, something that a linear model can't simply pick up.

Still, mileage shouldn't be completely taken out of the picture. The estimation of per 10,000km the price will be AED890 and this shows economic weight even though it's not statistically significant even when comparing vehicle ages with the same age. A bigger sample or a non-linear model might still show significance after all.

5.3 Brand Differences (RQ3)

All three brand coefficients have shown that it is statistically significant and negative relative to Toyota, which confirms that Nissan, Hyundai, and Mitsubishi are priced significantly below Toyota after having control for age and mileage. The hierarchy, from closest to Toyota to furthest, was Nissan (−AED 31,070), Hyundai (−AED 41,330), and Mitsubishi (−AED 47,130).

There's a brand premium that still remains even after some statistical controls and is consistent with a study done by Baltas and Saridakis (2010), who have found that intuitive and consistent brand premia in a hedonic car-market model, and with Alshboul et al. (2022), who established that brand as a significant determinant of residual value.

Something is worth mentioning to be cautious about, when it comes to the explanation of the premium like this reliability is usually the case, but not all studies agree. For instance, one study by Gongqi et al. (2011) found that when it comes to reliable mainstream brands, they typically hold their value longer, while another study suggests that used car depreciation had little to do with the actual measured reliability and this was done by Ginter et al. (1987).

Toyota has an edge in the UAE and it comes down to their reputation where their vehicles are known for holding up in desert condition, car parts availability and service network, and some of their models known for retaining their value, like the Land Cruiser and Prado (Research and Markets, 2024). And this means that for buyers the hierarchy result can be put to good use, because if you pick a Nissan that has the same age and mileage instead of a Toyota saves around AED 31,070, and if a Mitsubishi is chosen it can save around AED 47,130. H3 is supported.

5.4 Comparison With Straight-Line Theory (RQ4)

The observed depreciation rate is 3.5% and this is way off in comparison to the straight-line depreciation rate of 20%, this supports H4. Following the straight-line rule the value of the car will be gone in just 5 years and still cars in the UAE are shown to be selling with real money even if the age is around 8 to 11 years old.

Other studies found the same thing when it came to depreciation. There was a study that tested 54 models across 30 countries which was done by Storchmann (2004), the depreciation rate observed was way slower in developing markets than in industrialised ones because the statistics show 15% against 31%. But in the UAE it comes even slower than that and it fits with a market that has high demand and constant turnover. A study supports the pattern of this drop because in their study they made a model from used vehicle prices with an exponential function and their results found a rate that landed between 8.7% and 19% and this study was done by Yurko (2012). Which suggests that actual depreciation curves instead of it being a flat line that the straight line assumes.

The pattern observed here is closer to the 5% to 8% slow yearly depreciation rate than what the straight-line 20% or the double declining method both suggest and this fits with the idea that the concept of depreciation in accounting is truly made to allocate cost and not predict resale value. And this comes down to the reason of how the UAE market works, where there is heavy demand from expats, then there's limited public transportation which makes owning a personal car almost a necessity, and an ownership cycle that usually runs every three to five years and this keeps demand steady across all ages in the brackets (Arabian Business, 2020; Research and Markets, 2024). Overall, the evidence shows that the 5% to 8% depreciation is a much more realistic depreciation rate for used cars in the UAE.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

5.5 Summary of Hypotheses

Table 7 will show all the outcomes together it will show that three out of the four hypotheses were supported and only H2 was rejected and it was on mileage, results were pointing in the right direction, but the marginal result was driven by multicollinearity with age.

Table 7

Summary of Research Questions, Hypotheses, and Outcomes

RQ	Hypothesis	Key finding	Statistical result	Decision
RQ1	H1: Age has a significant negative effect	β = −4,263 per year	p < .001	Supported
RQ2	H2: Mileage has a significant negative effect	β = −0.089 (≈ −AED 890 per 10,000 km)	p = .077	Rejected (direction correct; multicollinearity, r = .639)
RQ3	H3: Brand significant, Toyota highest	Nissan −31,070; Hyundai −41,330; Mitsubishi −47,130	All p < .001	Supported
RQ4	H4: Observed rate below 20% benchmark	≈3.5% vs. 20%; ~62% value retained at year 11	Large divergence confirmed	Supported

5.6 Implications

Theoretical. This study gives UAE actual evidence that normal accounting depreciation does not describe how resale prices actually behave, there are studies like Arata and Hokari (2025) and Ben-Shahar and Sulganik (2008) who address putting more context into depreciation and this study pushes a hedonic pricing analysis into the Gulf market.

Practical. Buyers have a benchmark to follow now and it's only two steps First is age, then second is brand. Toyota holds the highest value compared to any other brand while Mitsubishi will give a big saving. And also dealers can benefit from this because they can base their pricing based on evidence now.

Policy. Since the asking prices aren't fully transparent to the buyers, price guides that are based on age and brand can be published in platforms or any consumer group because this will help with closing the information gap that Ke et al. (2025) mentioned.

5.7 Limitations and Future Research

There are a few limitations that are worth mentioning, since this study used asking prices from the listings instead of actual sale prices the values can be a bit lower than what the results showed. And since this is a cross-sectional design, it will only show the asking price from one moment in time. There is a huge overlap in the relation of age and mileage because statistics showed r = .639 meaning that it's really hard to separate them and show their individual effects. Things like condition, accident history, and service records aren't added in the listing data at all which does explain R^2 only resulted in .256, which is a limitation in studies that are based on listings, and it matches a studies saying, about how sensitive these models can be with the features you include and this mentioned by Huymajer et al. (2025). And because the listings have a lot of steps just to collect, the study was capped to 400 listings, of which 100 listings were spread equally to the four brands. Furthermore, machine learning studies that were done using UAE data have gotten better at predicting and it was done by Al Hashmi (2025) and AlShared (2021), but in this study it wasn't about trying to build a prediction tool instead it's meant to explain the relationship so it becomes more transparent. Future studies should include condition and service history, trying to use a non-linear model, use the actual sale prices, and try to expand to luxury brands.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

6. Conclusion

The goal of this study is to find the depreciation patterns in the UAE's used car market and collect 400 listings from Toyota, Nissan, Hyundai, and Mitsubishi and then analyse each of them by running correlations and multiple regression. All the research questions have been answered First with Age, which is the strongest predictor out of all of them, and it cuts about AED 4,263 off the asking price as each year passes and this will give the buyers a clearer view if the price is fair. Second is mileage, it came out negative which was expected and per 10,000km it drops the price about AED 890, though it didn't reach the significance level and this is most likely because of the strong relationship with age. Third is brand, this played a big role, Toyota was shown to hold a premium above Mitsubishi that comes about AED 47,130 and the rankings resulted in Toyota, Nissan, Hyundai, then Mitsubishi. The model explained about 25.6% of the price variation, though there's still plenty of factors like condition and negotiation that couldn't be included.

What stands out the most out of all is the observed depreciation rate because the result showed it's 3.5% annually which is far from the accounting 20% straight-line depreciation rate. Because a five-year-old car holds over 80% of its new estimated value and even if it's eleven years old it showed to keep 62% of its value and this goes against the straight-line method and makes it look like vehicles in UAE lose value faster than they actually do. Overall, this study accomplished what it set out to do by giving evidence-based depreciation for the market and it will contribute to both academic research and for real-world buyers to make their decision. For buyers the takeaway is simply made sure to negotiate on age first then on brand.

Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported.

Conflict of Interest Statement

The authors declare no conflicts of interest.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

References

Akay, E., Bolukbasi, M., & Bekar, E. T. (2018). Hedonic pricing model for second-hand cars: A case study of Istanbul. *Journal of Transportation and Logistics, 3*(1), 1–12.

Al Hashmi, M. (2025). *Data-driven prediction of vehicle residual value in the UAE automotive industry* [Master's thesis, Rochester Institute of Technology].

AlShared, A. (2021). *Used cars price prediction and valuation using data mining techniques* [Master's thesis, Rochester Institute of Technology].

Alshboul, O., Shehadeh, A., Al-Kasasbeh, M., Al Mamlook, R. E., Halalsheh, N., & Alkasasbeh, M. (2022). Deep and machine learning approaches for forecasting the residual value of heavy construction equipment: A management decision support model. *Engineering, Construction and Architectural Management, 29*(10), 4153–4176.

Andrews, T., & Benzing, C. (2007). The determinants of price in internet auctions of used cars. *Atlantic Economic Journal, 35*(1), 43–57.

Arabian Business. (2020, January 9). *Why the value of used cars is rising for the first time in the UAE*. https://www.arabianbusiness.com/

Arata, E., & Hokari, T. (2025). *Axioms of depreciation methods*. SSRN. https://ssrn.com/abstract=5240563

Balce, A. O. (2016). Factors affecting prices in an used car e-market. *Journal of Internet Applications and Management, 7*(2), 5–20. https://doi.org/10.5505/iuyd.2016.30974

Baltas, G., & Giakoumaki, C. (2023). The role of brand marques in automotive price formation. *Journal of Brand Management, 30*(2), 145–162.

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Baltas, G., & Saridakis, C. (2010). Measuring brand equity in the car market: A hedonic price analysis. *Journal of the Operational Research Society, 61*(2), 284–293. https://doi.org/10.1057/jors.2008.159

Ben-Shahar, D., & Sulganik, E. (2008). *Fair depreciation: A Shapley value approach*. SSRN. https://ssrn.com/abstract=1117511

Chen, Y., Wang, L., & Zhang, H. (2024). Used car price prediction based on multi-linear regression model. *International Journal of Automotive Technology, 25*(3), 567–578.

Erdem, C., & Şentürk, İ. (2009). A hedonic analysis of used car prices in Turkey. *International Journal of Economic Perspectives, 3*(2), 141–149.

Gavazza, A., Lizzeri, A., & Roketskiy, N. (2014). A quantitative analysis of the used-car market. *American Economic Review, 104*(11), 3668–3700. https://doi.org/10.1257/aer.104.11.3668

Ginter, J. L., Young, M. A., & Dickson, P. R. (1987). A market efficiency study of used car reliability and prices. *Journal of Consumer Affairs, 21*(2), 258–276. https://doi.org/10.1111/j.1745-6606.1987.tb00202.x

Gongqi, S., Yansong, W., & Qiang, Z. (2011). New model for residual value prediction of the used car based on BP neural network and nonlinear curve fit. *2011 Third International Conference on Measuring Technology and Mechatronics Automation*, 682–685.

Griliches, Z. (1961). Hedonic price indexes for automobiles: An econometric analysis of quality change. In *The price statistics of the federal government* (pp. 173–196). National Bureau of Economic Research.

Hendry, S. (2025). *An explorative study of linear vs non-linear hedonic pricing of second-hand cars in South Africa* [Master's thesis, University of Cape Town].

Huymajer, M., Filzmoser, P., Mazak, A., Winkler, L., & Kraxner, H. (2025). Opportunities and pitfalls of regression algorithms for predicting the residual value of heavy equipment: A comparative analysis. *Engineering Applications of Artificial Intelligence, 141*, 1–13.

IAS Plus. (2026). *International Accounting Standard 16: Property, plant and equipment*. Deloitte. https://www.iasplus.com/en/standards/ias

Ke, D., Li, X., & Zheng, Q. (2025). Role of value signals in information asymmetry markets. *Finance Research Letters, 72*, Article 106443.

Lancaster, K. J. (1966). A new approach to consumer theory. *Journal of Political Economy, 74*(2), 132–157. https://doi.org/10.1086/259131

Milheiro, A. B., Sousa, B. B., Ribeiro Santos, V., Milheiro, C. B., & Vilhena, E. (2024). Understanding the role of brand attachment in the automotive luxury brand segment. *Administrative Sciences, 14*(6), Article 119.

Porter, R. H., & Sattler, P. (1999). *Patterns of trade in the market for used durables: Theory and evidence* (Working Paper No. 7149). National Bureau of Economic Research.

Prieto, M., Caemmerer, B., & Baltas, G. (2015). Using a hedonic price model to test prospect theory assertions: The asymmetrical and nonlinear effect of reliability on used car prices. *Journal of Retailing and Consumer Services, 22*, 206–212.

Research and Markets. (2024). *UAE used car market: Trends, regional insights, competitive landscape, forecasts and opportunities*. https://www.researchandmarkets.com/

Rosen, S. (1974). Hedonic prices and implicit markets: Product differentiation in pure competition. *Journal of Political Economy, 82*(1), 34–55. https://doi.org/10.1086/260169

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson.

Scholze, A., & Wielenberg, S. (2007). *Depreciation and impairment: A trade-off in a stewardship setting* [Working paper]. Universität Bielefeld.

Storchmann, K. (2004). On the depreciation of automobiles: An international comparison. *Transportation, 31*(4), 371–408. https://doi.org/10.1023/B:PORT.0000037087.10954.72

Journal of Business Insight and Innovation
Volume 5 Issue 6, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

Vipond, T. (2019). *Depreciation methods*. Corporate Finance Institute. https://corporatefinanceinstitute.com/resources/accounting/types-depreciation-methods/

Yurko, A. V. (2012). *From consumer incomes to car ages: How the distribution of income affects the distribution of vehicle vintages* (MPRA Paper No. 36605). Munich Personal RePEc Archive. https://mpra.ub.uni-muenchen.de/36605/