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Hedonic Pricing of Chocolate Characteristics: Does Fairtrade Have Any Effect?

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Declaration

I hereby declare that I have done this thesis entitled Hedonic Pricing of Chocolate Characteristics: Does Fairtrade Have Any Effect? All texts in this thesis are original, and all the sources have been quoted and acknowledged using complete references and according to the Citation rules of the FTA.

In Prague, 21st April 2023

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Romoke Lawal

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Abstract

Cocoa is one of the most sought-after crops in the world. It is a significant raw material for products such as chocolate which is the primary industry using cocoa. However, cocoa production in developing countries faces sustainability problems, and as the world demand for chocolate and cocoa increases, these problems increase. Fairtrade, a private third-party and ethical certification scheme, is a means to mitigate these problems by setting a minimum price and providing a premium for these producers. Due to the increase in awareness of ethical consumption in the Czech Republic, the consumption of Fairtrade products, especially Fairtrade cocoa, has also increased. There is, however, little research about the contribution and impact of Fairtrade certification on the price consumers pay for Fairtrade-certified products. The main objective of this study was to determine the effect of Fairtrade certification and other characteristics on the market price of chocolate. 272 chocolate data were collected from hypermarkets and supermarkets in Prague between August and September 2022 using a convenience sampling technique. Descriptive statistics were used to review the chocolate brands available in the market. The hedonic model was used to determine the estimates and influence of each of the characteristics. The study results showed that Fairtrade certification is not statistically significant and does not affect the price. This finding is valuable to consumers as it will increase their willingness to pay for Fairtrade chocolate. Consumers can buy Fairtrade chocolates without premium price while fulfilling their ethical obligations in improving the lives of producers in developing countries. However, other factors such as brand, cocoa percentage, chocolate type, and Rainforest Alliance certification positively affect the price. This study will assist manufacturers and retailers in optimising their product offerings and pricing strategies.

Keywords: Cocoa, Sustainable Production, Ethical Consumption, Willingness to pay, Consumer Behaviour, Purchasing, Attributes

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List of the abbreviations used in the thesis.

ICCO	International Cocoa Organisation
FAO	Food and Agriculture Organisation
EU	European Union
LID	Living Income Differential
FOB	Free on Board
ICE	Intercontinental Exchange
UK	United Kingdom
US	United States
WTP	Willingness to pay
GMO	Genetically Modified Organism
EVOO	Extra Virgin Olive Oil
ASM	Artisanal and Small-scale Mining
FSI	Fairtrade Sourced Ingredients
CEE	Central and Eastern Europe

1. Introduction

Cocoa is one of the most demanded crops in the world. It is a tropical crop produced in countries within 10^0N and 10^0S of the Equator with high temperatures and rainfall. The cocoa bean is the cocoa tree's fruit, the only raw material for cocoa products. Cocoa is grown by about five to six million farmers worldwide, and it is a source of livelihood for about 50 million people (UNCTAD 2015).

According to the International Cocoa Organization (ICCO) and FAO et al. (2020), the major producing countries of cocoa in the world are Côte d'Ivoire, Ghana, Ecuador, Cameroon, and Nigeria in descending order, and they make up 76% of the global production, which makes Africa the central producing region. Cocoa production in Africa will increase in 2022/2023 to 3,772 thousand tonnes from 3,594 thousand tonnes in 2021/2022 (International Cocoa Organization 2023).

The demand for cocoa worldwide is increasing as the demand for chocolate, its primary product, is increasing (Beg et al. 2017). Chocolate is a common food item in the world, and it is consumed in various forms, such as chocolate tablets, sweets, spreads, cocoa powder, and truffles. In 2019, the global chocolate market was at 110 billion USD, estimated to increase to 139.94 billion by 2024 (Veraart Research Group 2020).

The major importers and consumers of cocoa by region in the world are Europe and North America. The European Union consumed about 36% of the global world cocoa production in 2017 (FAO & BASIC 2020). Therefore, the world's largest chocolate market is in Europe. According to Eurostat (2020), the European Union produced about 3.7 million tonnes of chocolate in 2019, valued at €17 billion. The largest producers of chocolate in Europe are Germany, Italy, and France. Likewise, Europe is also the leading exporter of chocolate in the world, with a sale of about 24.8 billion USD in 2021, making up an estimated 75.8% of global chocolate sales (Workman 2020). However, the chocolate market is also growing in Central and Eastern Europe in countries such as Bulgaria, Estonia, the Czech Republic, Poland, and Hungary (CBI 2020).

Cocoa production is faced with sustainability problems such as economical, regarding the inability to access financial services (Gaëlle et al. 2019), price volatility (Hütz-Adams Friedel et al. 2018), etc. social problems such as forced labour, child labour,

etc. and environmental such as climate change, deforestation (Voora et al. 2019; The World Cocoa Foundation 2022). As the demand for chocolate increases, the problem of sustainable production also increases.

To combat these sustainability problems, three types of initiatives have been put in place: political such as the EU-West Africa Initiative, private third-party such as the private sustainability programmes by chocolate manufacturers (Cocoa Plan by Nestlé) and certification schemes, such as Rainforest Alliance (UTZ), Fairtrade, etc. Fairtrade, as one of the private third-party certification schemes, was initiated to address the problem of sustainable production of selected crops such as cocoa, coffee, tea, cut flowers, rice, etc., in developing countries (Muradian & Pelupessy 2005; Fairtrade International 2023a). Fairtrade works by organising farmers and workers into groups and cooperatives so they can actively participate in negotiations and decision-making. It also establishes a minimum price for farm products to stabilise prices and boost farmers' incomes, as well as a premium price that can be used for any social or economic projects that will benefit the farmers and workers in their communities.

Fairtrade has impacted producers in the system. Producers of the top 7 products in 2021 got €190 million in Fairtrade Premium, which represents more than 90% of the farmers and workers in the Fairtrade system (Fairtrade International 2023b). The impact of Fairtrade has also been discussed in past literature, such as the study by Utting (2009) to determine the effect of Fairtrade coffee production in Nicaragua using the impact assessment framework. The study found that Fairtrade positively affects institutions, policymaking, and farmer living conditions.

In terms of the willingness to pay for Fairtrade products, it was discovered by Mai (2014) in their study that most consumers are prepared to pay extra for products with certification than those without certification. Furthermore, consumers are more inclined to pay a premium for Fairtrade-certified goods than those with other certifications) among these third-party certifications. (Vecchio & Annunziata 2015).

From 2017 to 2021, out of all the Fairtrade products in the Czech market (cocoa, coffee, bananas, sugar, and cut Fairtrade roses), Fairtrade cocoa was the most sold commodity, and the quantity increased by 61%, contributing about 35,144,140 CZK, in 2021 (Fairtrade Česko a Slovensko 2021). However, the influence of Fairtrade certification on the price of certified products, such as chocolate, in the Czech market is

limited. Hence, this study aimed to ascertain how Fairtrade certification and other factors affect chocolate market pricing in the Czech Republic.

The remaining chapters of the study are arranged as follows: chapter 2 reviews relevant literature about the cocoa overview, the problems of sustainable cocoa production and the different attempts at combating them, the Fairtrade system and the hedonic model, chapter 3 outlines the study's aims and objectives, chapter 4 highlights the data collection and methodology, chapter 5 presents the evaluation of study results, chapter 6 offers discussion and a proposal for recommendations based on the study, and chapter 7 presents the conclusion of the study.

2. Literature Review

2.1. Overview of the Cocoa

2.1.1. Cocoa Industry

Cocoa is of significant economic importance both for producing and consuming countries. For producing countries, it generates export revenues, income, and employment. Globally, cocoa is produced by five to six million farmers and contributes to the sustenance of 40 to 50 million people (CocoaNet 2022; Tridge 2023). For most of these people, cocoa constitutes the main, if not only, source of cash income. In consuming countries, cocoa is an essential ingredient in the confectionery and food and beverage industries and, more recently, in the pharmaceutical and cosmetics industries. Thus, considering the importance of cocoa in the global economy, ensuring the sustainability of its production is critical, particularly when most young people need to consider farming as a viable business choice. In the case of cocoa, this is probably due to the low profitability of its farming businesses and the relatively poor living standards of cocoa growers.

Because cocoa beans are frequently exported for processing and sale to final consumers, the cocoa and chocolate industries also provide employment in importing countries. In 2011, it benefitted 650 American businesses and 2,000 organizations serving 70,000 people throughout the European Union. (Voora et al. 2019).

In 2017, the retail market for chocolate, which used 43% of all cocoa, was worth USD 106.19 billion., with an estimated growth of 189.89 billion USD by 2026 (Eghbal 2018; Voora et al. 2019). The global cocoa beans production estimate for 2022/2023 was 5,017 thousand tonnes (International Cocoa Organization 2023). The value of all exported cocoa beans in 2017, whether whole or broken, unprocessed or roasted, was USD 8.6 billion (Eghbal 2018). To make chocolate, cosmetics, and a range of food products, cocoa beans are first converted into cocoa liquor and then transformed into cocoa butter or cocoa powder.

2.1.2. Problems of Cocoa Production

Cocoa, also known as the “food of the gods, " is mainly produced by hand. There has not been any extensive mechanisation in its production. Despite this constraint, the supply of cocoa is increasing every year due to the demand for chocolate both in the traditional chocolate markets of Western Europe and North America and emerging markets in Asia. As a result, the global cocoa sector has been forecasted to increase by 7.3% in Compound Annual Growth Rate (CAGR) from 2019 to 2025 (Voora et al. 2019).

Nevertheless, cocoa production faces many interrelated challenges that affect sustainable production. These problems affect the productivity of cocoa, the lives of cocoa farmers, and the environment and cause rural-urban migration (Fountain & Huetz-Adams 2020a; Foodcircle 2022). The problems are broadly divided into three, which are economic, social, and environmental. In addition, issues such as political instability also affect its production (Anderson 2011).

The economic problems of sustainable cocoa production range from finance, and price volatility, to share in the global added value and low yield. These problems result in systemic poverty of farmers in the producing countries. The marketing challenges are due to a lack of access to market information, transportation costs, and individual sales instead of leveraging the power of cooperatives (The World Cocoa Foundation 2022). Lack of access to financial services prevents the farmers from purchasing high-quality cocoa plants and inputs to use on their farms (Gaëlle & Victorine 2019). The low and insecure market price of cocoa beans on the world market and the small part of the market price that farmers receive due to local trading structures, taxes and the quality of their beans is an economic problem affecting sustainable cocoa production.

Price volatility of cocoa market prices also affects the income security of farmers. This can be caused by speculations by traders and investors in commodity exchanges for future markets (Hütz-Adams Friedel et al. 2018). For example, the future price of cocoa in late 2015 of USD 3,422 per tonne significantly dropped to USD 1,769 per tonne in mid-2017 (Voora et al. 2019). Price volatility can also be caused by political instability in producing countries (Anderson 2011).

Although the cocoa and chocolate sector are thriving, the actors in the value chain, such as the grinders, manufacturers, and retailers, get a large part of the profit. The low

share is because, in the global value chain of cocoa, the more significant part of added value is done in the importing countries (Make Chocolate Fair! 2023).

Farmers also experience low yield due to ageing cocoa trees and high production costs due to high prices of inputs such as high-quality cocoa plants, fertilisers, pesticides, and herbicides.

The social problems include lack of access to education, child labour, forced labour, limited knowledge of farming practices, and inadequate infrastructure. Many farmers in developing countries lack access to primary education. This affects their decision-making, negotiating good deals for their produce, and being up to date with modern farming practices. Furthermore, farmers engage their children in farming to reduce their production costs, preventing them from going to school and making them participate in dangerous farm work from which they can sustain injuries (The World Cocoa Foundation 2022). The issue of child trafficking for forced labour is also a big problem as children from neighbouring countries of the major producing countries are bought for low prices and exploited as cheap labourers on farms.

Farmers also have limited knowledge of modern farming practices and, therefore not aware of sustainable ways of producing cocoa. In addition, a lack of adequate infrastructure, such as roads, makes transporting their harvests more expensive, reducing their income. Cocoa-producing communities also lack safe drinking water and proper sanitation.

The environmental challenges facing sustainable cocoa production are a decline in soil fertility, climate change, deforestation, and land degradation. Continuous cocoa cultivation and erosion due to heavy rainfall can decrease soil fertility (Climate-Smart Cocoa 2022). Because of this, farmers use excessive fertiliser, which can lead to soil and water pollution. The infestation of pests and diseases on cocoa farms has also led to the uncontrolled use of pesticides, herbicides, and other chemicals. The effect of climate change, such as increased temperature, can lead to reduced yield, triggering deforestation to increase production (Voora et al. 2019; Climate-Smart Cocoa 2022).

Farmers tend to increase production to meet global demands by clearing additional forests for cultivation when the yield is low, due to a decline in soil fertility, climate change, or when there is a spike in the international market price of cocoa. This results in deforestation, leading to biodiversity loss and climate change (Fountain & Huetz-Adams

2020b). Extreme weather conditions such as drought results in land degradation, which reduces the availability of land for cultivation (Climate-Smart Cocoa 2022).

2.2. Initiatives Towards Sustainable Cocoa Production

As a means of tackling the sustainability problems in the cocoa production sector, some major initiatives have been developed and launched. Some of these initiatives are by the government, such as the European Union Sustainable Cocoa Initiative and the Living Income Differential, and by private third parties: by chocolate manufacturers and certification schemes.

2.2.1. Governmental Sustainable Cocoa Initiative

In 2019, the governments of the largest producers of cocoa in the world, Côte d'Ivoire, and Ghana, in consultation with the chocolate industry, launched the Living Income Differential (LID) to increase farmers' income and thereby improve their living conditions. This is done by applying a premium price of USD 400 per tonne on cocoa export from the 2020/2021 cocoa year. The funds from the LID will then be used to ensure that 70% of the Free on Board (FOB) price of USD 2,600 reaches the farmers.

Since the launch of this initiative, there have been speculations on the programme's effectiveness and its effects on the chocolate industry. First, the amount of the cocoa price that the farmers will receive is not clarified, and there is no transparency about where the funds are being stored and how the funds will be implemented. Also, the structures of the two countries will determine how effective the initiative will be. So far, the findings carried out by Webb (2021) discovered allegations of corruption in the LID.

As reported by Myers (2020), Hershey, which is one of the big companies in the chocolate industry, has started buying large quantities of their cocoa in the ICE commodity future exchange as it is cheaper there and not through the physical market in West Africa after the LID was introduced. Other companies can follow the same trend, which will jeopardise the LID's aim.

In 2020, the European Commission also launched an informal dialogue about the initiative to improve sustainability in the cocoa sector in the two major producer countries of cocoa in the world, Côte d'Ivoire and Ghana, in the amount of €25 million (European

Commission 2020). This initiative is built on the LID initiated by the two countries to improve the farmers' decent income. It also corresponds to the European Union's political priorities under the Green Deal and the European Commission’s zero tolerance towards child labour.

The initiative is to improve the economic problem of low-income farmers, the environmental problem of deforestation and forest degradation and the social problem of the use of child labour on farms.

2.2.2. Private Third-Party Certifications

The leading companies in the chocolate industry have their internal sustainability programmes for sustainable production. Examples of such programmes by cocoa importers, processors, and chocolate manufacturers are Cocoa Life Sustainability Program pioneered by Mondelez International, Forever Chocolate by Barry Callebaut, Ferrero Sustainability by Ferrero, Sustainable in a Generation Plan by Mars, The Cargill Cocoa Promise by Cargill, and Nestlé Cocoa Plan by Nestlé etc. In addition, some retailers also have their code of conduct, such as Actions, not words – sustainability at Coop by Coop and Sustainable Retailing by Ahold Delhaize.

However, there have been criticisms about the effectiveness of some of these programmes. Cocoa Life by Mondelez International was referred to as a marketing tool due to the failure of the company to provide a link on its website that shows the interactive map of all Cocoa Life locations and impact assessments to promote transparency as requested by the consumers (Nieburg 2019).

In 2020, a lawsuit was filed against Nestle and Cargill in California that the firms had contributed to and encouraged human rights violations because they had bought cocoa beans from plantations despite knowing that the farms engaged in child labour. Although the lawsuit reached the US Supreme Court, it was thrown out in 2021 because it was based on acts that took place abroad (Howe 2021).

Mondelez International was also accused of using child labour on the farms in their supply chain in Ghana in an investigation by Antony Barnett, a reporter from UK’s public television channel called Channel 4 Dispatches. In the video clip, children about ten years of age were involved in challenging work on cocoa farms (Ungoed-Thomas 2022; Newsroom Infobae 2022).

The third-party system also includes certification schemes which have been developed to promote the sustainable production and consumption of products. These schemes follow standards and procedures that companies and products must follow before issuing the certification. In the cocoa industry, Organic, Fairtrade, and the Rainforest Alliance (UTZ) are the four main certification programmes. In 2016, about 3.8 million hectares of the cocoa plantation were certified by these schemes (FAO & BASIC 2020).

In 2018, UTZ and Rainforest Alliance merged to combine their strengths in combating the problem of sustainable production (Rainforest Alliance 2023). About two million farmers in 70 countries are in the Rainforest Alliance system. Rainforest Alliance certification is committed to preserving land and forests in ways that improve rural communities' rights and economic well-being. They achieve this by encouraging farmers to use climate-smart agricultural methods to facilitate climatic adaptability, using their "Assess-and-Address" strategy to confront concerns of violation of human rights (forced labour, harassment at work, discrimination, and child labour) while vehemently opposing discrimination based on gender. The development of rural prosperity to enhance the livelihoods of farmers and farm workers through the implementation of Sustainability Investments, an additional fund or in-kind payment to assist farmers with executing and achieving the demanding sustainable agriculture standards, and Sustainability Differential, a required monetary payment to Rainforest Alliance certified farmers that exceeds the market price for their crops (Rainforest Alliance 2020).

Fairtrade is another important certification scheme whose aim is to improve the living conditions of farmers through the commitments of actors in the agricultural chain. It works by organising farmers and workers into groups and cooperatives for them to be actively involved in decision-making and negotiations within the chain, by setting a minimum price for farm produce to stabilise price and increase farmers' income and by a premium price which can be used for any social or economic projects that will be beneficial to the farmers and workers (Fairtrade International 2023n). Fairtrade International is the primary Fairtrade certification in the world, and they have certified cocoa plantations in Côte d'Ivoire, Ghana, Dominican Republic, Peru, and Ecuador which make up 93% of the total Fairtrade International cocoa areas (Fairtrade International 2023d).

Organic cocoa is also increasing in the cocoa sector as healthy consumption is increasing in developed countries. As a result, the demand for organic chocolate is estimated to grow by 3% between 2020 and 2024 (Maida 2020). Organic cocoa comprises 3.1% of the global cocoa area and certified about 320,100 hectares of harvested areas in 2016 (FAO & BASIC 2020). Organic certification in the cocoa sector is majorly found in some parts of Africa, such as the Democratic Republic of Congo, Uganda, Sierra Leone, and the United Republic of Tanzania, and in Latin America in countries such as Dominican Republic, Costa Rica, El Salvador, Mexico, Nicaragua, Panama, Peru. Latin America accounts for over 80% of certified organic cocoa in the world (FAO & BASIC 2020; Wilmor Publishing Corp 2023).

2.3. Fairtrade

The concept of Fair Trade[1] has been advancing for some years. Fair trade seeks to improve the welfare of poor farmers and provide improved working conditions for them while ensuring adherence to human and labour rights and the practice of sustainable agriculture (Hayes 2006). Fair trade is also essential to free trade as it allows small-scale farmers to participate in international trade, encouraging labour competition, erasing monopolies in local and global markets, and encouraging non-trade values (Hayes 2006).

Fairtrade is a third-party certification scheme. It is a means of transforming trade through higher prices and bettering the standard of living of farmers and workers in developing countries. Fairtrade is a leader in the world in promoting fair trade by bridging the gap between people who produce goods and those who buy. Fairtrade label is the most famous in the world known for fair trade. Fairtrade works by setting a minimum fair price that covers the average costs of producing the commodities covered sustainably. This is a safety net for producers because when the market price is low, they receive the minimum price set, and when the market price is high, they get paid the standard price on

[1] In this thesis, Fair Trade is a general term for ethical trading while Fairtrade refers to any or all operations of Fairtrade International eV, FLOCERT, National Fairtrade Organizations, Fairtrade Producer Networks, and Fairtrade Marketing Organizations.

the market or the price agreed upon. This way, the producers and workers are hedged out of risks.

Fairtrade also works by giving Premium, which are additional funds provided to farmers and workers to invest in projects they choose. These Premiums have often been used in targeting needed community improvements, such as health, education, transportation, trainings, and investments in resources that improve their businesses. Furthermore, Fairtrade provides decent working conditions and does not tolerate discrimination, forced labour of workers and child labour on farms. They also provide farmers access to advance credit ahead of harvest time when needed. All these enable the farmers to plan with more security and to have stronger relationships with the buyers.

Fairtrade is part of the sustainable and inclusive business models with a long-term vision whose social and environmental mission is to create value rather than capture value, create an avenue for members to participate actively in decision-making and share their views (Heysse et al. 2020). The Fairtrade situation came to reduce inequalities in the lives of farmers or rural poor in developing countries. It operates with standards that support sustainable development, consisting of socio and economic criteria that benefit the producers and ensure that traders comply and commit to these standards. This will create fair living and working conditions for the farmers, empower women and youths in agriculture, and ensure that marginalised people have access to and benefit from equal opportunities.

Fairtrade standards are the foundations of the Fairtrade system. They aim to guarantee more equitable trade conditions between farmers and buyers, safeguard workers' rights, and give producers the framework they need to establish successful farms and organisations (Fairtrade International 2023e). They include the standards for small-scale producer organisations, hired labour organisations, contract production, trader, climate, textile, and gold. The principles for small-scale producer organisations are that members must be small-scale producers, democracy (the organisation's decision-making process includes participation from and voting by all members) and fostering effective producer organisations (Fairtrade International 2023f). For hired labour, the principles are management of the Fairtrade premium, freedom of association and collective bargaining, and equitable working conditions for all workers (Fairtrade International 2023g). The contract production standard is for small-scale producers who still need to

be organised democratically (Fairtrade International 2023h). Trader standard refers to standards that companies and producers trading Fairtrade products must adhere to, such as transparency, fair price, Fairtrade premium, market information for planning, access to pre-finance, trading with integrity along the supply chains, compliance with labour and environmental law etc. (Fairtrade International 2023i). Climate standard was created to assist smallholder farmers and rural areas in creating Fairtrade Carbon Credits and gaining access to the carbon market, and the principles include end-buyer emissions reductions, respect to labour conditions and environmental practices etc. (Fairtrade International 2023j). Textile standard which aims to promote improvements to textile supply chains and associated business procedures include fair, reliable, and predictable contract arrangements, empowerment of workers, occupational health and safety, reduction of negative impacts on workers and the environment etc. (Fairtrade International 2023k). The Gold standard seeks to provide possibilities for artisanal and small-scale miners and their communities by encouraging formalising the Artisanal and Small-scale Mining (ASM) sector (Fairtrade International 2023l).

In addition, Fairtrade helps to deliver the Sustainable Development Goals such as the end to poverty for Goal 1, end to hunger and to provide food security for Goal 2, achieving gender equality and empowering women and girls for Goal 5, promoting sustainable and inclusive economic growths for Goal 8, ensuring sustainable consumption and production patterns for Goal 12, combating climate change and its impacts for Goal 13, fostering societies that are democratic and equitable for Goal 16, strengthening and revitalising the global partnership for Goal 17 (United Nations 2015).

The International Fairtrade system is represented by the Fairtrade Mark (Fairtrade International 2023m). Products with these Marks adhere to the social, environmental, and economic Fairtrade Standards that have been universally accepted. Fairtrade International owns and is authorized to use the Fairtrade Marks. The primary black Fairtrade Mark shown in Figure 1 indicates that the product is completely traceable from farm to shelf and is maintained apart from non-certified goods. This means that all the ingredients in the product presented as Fairtrade are certified as Fairtrade. The Fairtrade Sourced Ingredient (FSI) Mark shows that the ingredient shown on the tab in a product has been sourced as Fairtrade; for example, Fairtrade cocoa in chocolate and none of the other ingredients in the product are Fairtrade-certified. The Fairtrade Mark with an arrow means

to read the packaging's back to get additional information about the ingredients and sourcing process. The FSI Mark with an arrow for Fairtrade cocoa is shown in Figure 2.

Figure 1. Primary Fairtrade Mark

Figure 2. Fairtrade Sourced Ingredient Mark for Cocoa

2.3.1. Impact of Fairtrade

The impacts of Fairtrade have been discussed in many research studies (Utting 2009; Ruben et al. 2009; Jari et al. 2013; Jena & Grote 2017; Meemken et al. 2019). Utting (2009) used the impact assessment framework to determine the impacts of Fairtrade coffee production in Nicaragua. The study revealed that Fairtrade has a positive impact on farmers' living conditions, policymaking, and institutions. Jena et al. (2017), in their research in India to determine the effect of Fairtrade certification on small-scale coffee farmers' livelihood, found that there is improvement in the lives of Fairtrade-certified farmers due to higher and guaranteed farm gate pricing, regular collection of coffee from village centres that lowers travel costs, and the Fairtrade Premium. In the study carried out by Meemken et al. (2019) to examine how Fairtrade has affected the pay and working conditions for employees in the local farm sector among coca farmers and workers in Cote d'Ivoire discovered that Fairtrade increases cooperative employees' incomes and decreases their level of poverty and enables cooperatives to serve their members better, creating more and better-paying collaborative work opportunities.

Agricultural products under Fairtrade include cocoa, coffee, bananas, cotton, tea, sugar, rice, quinoa, honey, flowers, vegetables, herbs/spices, nuts/oil, and fruits/juices. According to Fairtrade International (2023n) and (2023o), Fairtrade is present in 70 countries and territories with more than 1.9 million farmers at Fairtrade-certified small-scale producer organisations, 178,795 workers at Fairtrade-certified plantations in 2020, and 1,772,368 producer organisations in 2020. Latin America and the Caribbean have the

highest Fairtrade-certified producer organisations' growth in global and regional totals, followed by Africa, the Middle East, Asia, and the Pacific (Fairtrade International 2023o).

In 2021, €190 million Fairtrade Premium was received by producers for the top 7 products, which indicates more than 90% of the farmers and workers enrolled in the Fairtrade system (Fairtrade International 2023b). The top 7 products are coffee, cocoa, bananas, sugar, flowers and plants, tea, and cotton. According to Fairtrade International (2023b), for small-scale producer organisations, the Premium was used for services for farmer members (48%), investment in producer organisations (44%), and services for communities (8%). For hired labour organisations, the Premium was used for services for workers and families (80%), benefits for communities (12%), and training and empowerment of workers (9%).

Also, in 2021, the total production of Fairtrade-certified products for the top 7 products was 1,461,353MT for bananas, 699,234MT for cocoa (cocoa beans), 923,464MT for coffee (green beans), 55,318MT for cotton (seed cotton), 5,263,230,062 in stems for flowers and plants, 553,816MT for sugar (cane sugar), and 180,575MT for tea (Camellia sinensis) (Fairtrade International 2023d). More than 37,000 Fairtrade products are available to consumers, and Fairtrade products were sold in 143 countries in 2021 (Fairtrade International 2023n).

According to Fairtrade (2023d), in 2021, there were 417 producer organisations, 457,347 farmers, 1,523,686 hectares of land for cocoa production, 699,234MT of cocoa produced by producer organizations, 241,455MT of cocoa sold as Fairtrade, and €49,122,519 premium earned. Cote d'Ivoire was the largest producer of Fairtrade cocoa, followed by Ghana, Peru, Dominican Republic, and Ecuador. The Premium received was used for investment in producer organizations (66%), services for farmer members (20%), and services for communities (14%).

2.3.2. Fairtrade in the CEE region and the Czech Republic

Although the traditional cocoa market is in Western Europe, Central and Eastern Europe is also becoming an interesting destination for cocoa (CBI 2020). The cocoa and chocolate market are growing because they have the highest growth rate for importing cocoa beans from developing countries in Europe. Bulgaria is the largest importer of cocoa beans with 16.7 thousand tonnes in 2020, followed by Poland with 15.3 thousand

tonnes, Slovakia with 7.1 thousand tonnes, Croatia with 1.8 thousand tonnes, Czech Republic with 106 tonnes, and Hungary with 6 tonnes (CBI 2021). In addition, the development of local chocolate events in the country has led to an increase in new craft chocolate makers, increasing the visibility and accessibility of speciality cocoa. Also, there is an increased interest in high-quality bean-to-bar chocolate in the Czech Republic.

Bean-to-bar chocolate refers to chocolate made with high-quality cocoa beans and other quality ingredients and methods by a chocolate maker and not a chocolatier or from bulk chocolate makers from scratch with control over the entire process from the sourcing of the bean to the making of the chocolate (sorting, roasting, peeling/winnowing, grinding, maturation/ageing, tempering and packaging) (Bean To Bar World 2023). Many chocolate makers in the Czech Republic source their cocoa beans from Africa (Tanzania, Uganda, Madagascar), Central and South America (Ecuador, Colombia, Belize, Dominican Republic, Guatemala, and Peru), and Southeast Asia (Vietnam, Bali) to produce bean-to-bar chocolates and these chocolates are readily available on their online shops or physical stores. Examples of such bean-to-bar chocolate makers are Jordi's Chocolate, Herufek Chocolate, Míšina Chocolate, Janek Chocolate, Pražská Čokoláda, Ajala Chocolate, Chocolatovna Troubelice.

Due to the increased awareness of ethical consumption, there is an increase in the awareness and consumption of Fairtrade products. According to Fairtrade Česko a Slovensko (2021), the Fairtrade commodities majorly available in the Czech and Slovak markets are cocoa, coffee, bananas, sugar and cut Fairtrade roses. Fairtrade cocoa has been the most sold commodity out of all the commodities since 2017. In 2021 compared to 2020, Fairtrade cocoa increased by 61%, Fairtrade coffee increased by 35%, Fairtrade banana by 37%, and Fairtrade sugarcane by 97%.

Farmers and workers in producing countries received 55,581,889 CZK in 2021 from the sales of Fairtrade products in the Czech Republic and Slovakia. This is a 46% increase from the sales of Fairtrade commodities in 2020, which was 39,995,228 CZK. Fairtrade cocoa contributed the most of all the commodities with 35,144,140 CZK, followed by coffee with 17,533,740 CZK, banana with 802,000 CZK, and cut roses with 774,377 CZK.

According to the awareness survey carried out by The MEDIAN Company in February, March, and April 2022 of 1000 respondents, 38% know what the Fairtrade

Mark means, 26% know the Fairtrade Cocoa Mark and 66% of people in the Czech Republic are aware of the Fairtrade Mark (Fairtrade Czechia and Slovakia 2022).

Among retailers in the Czech Republic, Lidl has the most sales of Fairtrade cocoa, with a sales increase of about 66% compared to the previous year, and Fairtrade cut roses, followed by Kaufland. Lidl also contributed the most to the Fairtrade payment to producers involved in Fairtrade in developing countries (Fairtrade Cesko a Slovensko 2022).

2.3.3. The willingness of consumers to purchase Fairtrade products

Today, people's identity is defined by the products they buy and their preferences are shaped by how they see themselves. Therefore, every purchasing decision is based on a choice derived from people's tastes, which requires consumers to compromise between many characteristics to locate the product that best suits their identity. In light of this, purchasing is a way to communicate class, principles, as well as goals about oneself and social image (Dittmar et al. 2007).

The term willingness to pay has become widespread, widely used, and therefore often used in different contexts. Willingness to pay (WTP) became a concept that did not only describe an actual monetary willingness to pay but also described other demand-based approaches.

As Becker-Olsen et al. (2006) noted, Fairtrade buying is a significant form of ethical production and consumer behaviour. Usually, consumers can express their ethical concerns by buying products with positive qualities or boycotting products with negative qualities, such as the employment of underage labour, low rural earnings, and hazardous working conditions. However, consumers have shown a growing interest in purchasing products with such features that promote social well-being (De Pelsmacker & Janssens 2007; Stratton & Werner 2013; Andorfer & Liebe 2015).

There has been extensive research on goods with the Fairtrade label. Previous research has taken a variety of angles, including willingness to pay, preference for Fairtrade certification over other sustainability features or conventional items, and varied buying intentions based on sociodemographic parameters. According to previous studies, consumers favour the Fairtrade label over other sustainability designations (Mai 2014; Rousseau 2015). Furthermore, many consumers are prepared to pay extra for products

with certification than for those without certification (Mai 2014), and they are prepared to pay extra for Fairtrade certification compared to other certifications (Vecchio & Annunziata 2015). Therefore, we can predict a positive relationship between the price of Fairtrade labelled products and WTP.

Also, the study by Ruggeri et al. (2021) carried out in Milan, Italy, in 2018 to analyse the WTP of consumers to pay for Fairtrade products (sugarcane sugar packs) when additional information about Fairtrade is provided discovered that there is a positive relationship between Fairtrade certification and WTP of the consumers. This indicates that customers are prepared to pay more for Fairtrade goods and may even do so if given more information.

2.3.4. The Hedonic Price Concept

The origin of the study of differentiated products, specifically hedonic methods, is often traced to the work of Waugh (1928), where he applied the hedonic pricing method to asparagus in the Boston market. However, early and important contributions to the formal theory and empirics of hedonic pricing theory have come from the findings of Lancaster (1966) and consumer price index literature (Triplett 1986).

Hedonic price analysis is based on the idea that the qualities and attributes of a product—rather than the product itself—ultimately determine its value to a consumer (Acciani et al. 2021). Differentiated goods are therefore treated as bundles of various quality attributes that differentiate them from related goods. Consequently, the observed equilibrium market price is a function of the (implicit) prices of each quality attribute. This idea was formally presented in Lancaster (1966).

Lancaster (1966) developed a consumer theory where all goods are composite, and people buy those goods for the characteristics that make them up rather than for the goods themselves. However, the pivotal treatment of the idea and the one that placed the hedonic study on firm footing was Rosen (1974). Rosen formalised how the hedonic price function and mapping multiple product attributes into price space can be obtained from the market behaviour of profit-maximising firms and utility-maximizing consumers. His model assumes that consumers and producers are price takers (i.e., they must take the market price). He then derives supply and demand from the consumers' preferences and the producers' profit-maximization decisions.

Also, Rosen assumed that there exists a price function *p* (z*)*, where *z* is a vector of characteristics describing the composite good being studied. That is, the characteristics in *z* determine the price paid every time a consumer buys one of the mixed goods being studied. It also assumes that consumers have utility functions *U* (c, *z*; *x)*, where *c* represents consumption of all other goods, and *x* parameterizes different consumers. The model explicitly allows different consumers to have different preferences. Each consumer chooses the version of the composite good to purchase to maximize their utility, considering the price. That is, the consumer solves the problem:

$$\max(y - p(z), z; x)$$

Where *y* represents the consumer's income.

The Lancastrian model, Rosen's model, and the hedonic price model all surmised that goods possess many attributes that combine to form bundles of characteristics (or objectively measurable, utility-affecting attributes), which the consumer values, but these models have some fundamental differences. According to the Lancastrian model, items belong to a group and can be combined to be consumed in different ways depending on the consumer's budget. Rosen's approach, in contrast, assumes a variety of commodities, but that normally buyers do not acquire desired traits by acquiring a combination of items (Herath & Maier 2010). As a result, Rosen's concept is more appropriate for durable items, whilst Lancaster's approach is better suited to consumer goods. The Lancaster theory likewise presupposes a linear relationship between the cost of items and their properties. Only if there is a modification in the mix of products consumed can they change.

The empirical specification for hedonic pricing is constantly debated since the theory prescribes no specification. Three functional forms can be considered according to the literature to calculate the hedonic estimates, and the appropriate form to choose has also been debated. Because of this, some literature uses the three functional forms and then examines the difference in the estimates. For example, Carew (2000) examined the three functional forms in their study to analyse the effect of product quality characteristics (cultivar, grade, and fruit size) on apple prices in British Columbia. Bedell (2017) also considered the three functional forms in their paper to calculate the hedonic estimates for the influence of nutrition (calories, total fat, cholesterol etc.), quality (weight, chocolate type, fruit/nut etc.), and marketing (Fairtrade, organic, gluten-free etc.) characteristics on

the chocolate prices, particularly the fruit or nut characteristics. It is often pointed out that the choice of the functional form should be driven by the data at hand and by comparing the three functional forms: linear, semi-log, and double-log.

Many literatures have used hedonic theory in their empirical studies. Traditionally, hedonic analysis has been used for durable goods because they have well-defined characteristics that make them assessable and easily defined by consumers.

Hedonic pricing analysis was used to assess the impact of the Home Energy Rebate programme in the Fairbanks North Star Borough in Alaska on the purchase prices of single-family homes from 2008 to 2015 (Pride et al. 2018). The characteristics considered were square footage, number of bedrooms, number of bathrooms, age, the car capacity, whether the garage is heated, and the property's acreage and elevation. The results showed that residences in the Fairbanks North Star Borough that successfully finished the Home Energy Rebate program are priced 15.1–16.5% higher than comparable homes that did not complete the program (Pride et al. 2018).

In the study conducted by Ahmad et al. (2019) to determine the pricing of mobile phone attributes from Lahore and Faisalabad in Pakistan between 2016 and 2017, it was revealed that brand, battery capacity, weight, operating system, RAM, memory size, and display size have a significant positive effect on the price of mobile phone.

Wang et al. (2019) used the hedonic price model to determine the relationship between tourism seasonality, online user ratings, and hotel price determinants using the online hotel dataset in Sanya, China. The results revealed that there is a significant relationship between hotel prices and tourism seasonality in which hotel prices in the high season increase by 23.1% and by 159.9% during Chinese New Year.

Hedonic price analysis was also used in the Art industry of the South African fine art auction by Fedderke et al. (2020) from 2009 to 2014 to investigate the full sales hedonic price estimator of a large set of features. The results showed that features such as identities of artists, medium and genre, dating characteristics, and artwork's physical characteristics significantly affect the complete sale.

2.3.5. Hedonic Modelling of Food Products

Studies have also been conducted using hedonic pricing on nondurable goods such as wine, olive oil, apple, milk etc. Landon et al. (1998) used a hedonic model to explicitly model reputations as consumers' expectations of quality and separated firm (winery) and regional reputations. Extending this line of research, Costanigro et al. (2012) used a hedonic wine model to study how names and reputations nest within each other. They showed that reputation price premiums drift from aggregate (regional) names to specific (firm) ones as product prices increase.

By concentrating on the idea of the exogenous price in the wine market, Nerlove (1995) adds to the body of literature. The Swedish wine market's utility maximization was the main topic of this investigation. Nerlove (1995) regressed sales volume on the cost and merits of the product. The result from this study is that the findings of a hedonic specification with an endogenous price as the dependent variable may be biased if the quantity supplied is exogenously set.

Carew (2000) contributes to the hedonic literature by emphasising quality characteristics, marketing factors, and interaction effects using attributes such as cultivar, grade, fruit size, marketing season, shipment, and package size to estimate the hedonic price. According to the findings, grades and marketing variables both affect premiums or discounts for the quality of products, and interactions between grade qualities and marketing variables show how various features are interdependent.

Muñoz et al. (2015) also determined the attributes and the implicit value of the relevant characteristics of olive oil, such as acidity, origin, package size, packaging, brand, and type of retailer on the price consumers pay in supermarkets in Chile using hedonic pricing model from 12 supermarkets between September and October 2012. The results showed that acidity, origin, and packaging significantly positively affect the final price of olive oil.

Bedell et al. (2017) highlighted the chocolate transaction data, using characteristics such as the retail price, total carbohydrates, protein, the type of chocolate if the chocolate was filled with fruit or nut, the quantity of the cocoa content, whether chocolate has Fairtrade, and organic labels, brand, origin, etc. were regressed on the price to determine the influence of each characteristic, especially fruit or nut characteristic. The

data used were from the leading online stores in the United States. The result revealed that the feature of interest, fruit or nut, is not statistically significant. In contrast, the price is positively impacted by total fat content, chocolate weight, type, Fairtrade certification etc.

Ferro & Ignacio (2018) used hedonic pricing to determine the factors such as year of ranking, years of storage, country of origin etc., that influence the price of top-quality wine using the data from the publication – Wine Spectator from 2003 to 2016. The results revealed that the wine's rating and years of storage positively influence the price, whereas quantity produced, varietal and condition negatively influence the price.

Bimbo et al. (2020) also used the hedonic model to test the effect of country-of-origin information for extra virgin olive oil (EVOO) using the data from 982 consumers at supermarket checkouts in Italy. The results revealed that EVOO produced in Italy and which the label indicates, has a premium price of 35% compared to products which are made of blends of European EVOO, as shown on the label and that EVOO from a non-European origin has a -10.8% discount attached to them.

Chemistry explains that humans have innate taste preferences for sweets, fat and salt, just like in chocolate consumption, because they provide sufficient calories and other essential nutrients for survival motivations (Parker et al. 2006). Given their flexibility, hedonic models are perfect for detecting the main price determinants and assessing the contributions of different product features.

3. Aims of the Thesis

Ethical consumption through the purchase of products with a private ethical label such as Fairtrade is one of the means to address the sustainability problems in cocoa production and trade. However, past research on Fairtrade certification in the Czech market has been focused on the willingness to pay and consumer perspectives. As a result, there is little research about the contribution of Fairtrade certification to the market price of cocoa products such as chocolate, even though the high price of Fairtrade products is typically mentioned as a main obstacle for wider ethical chocolate consumption. Therefore, the aim of this study was to estimate the implicit values and influence of characteristics, especially Fairtrade certification, on chocolate market price. This will determine the factors that influence the chocolate market's potential for growth and add to the wealth of knowledge.

The specific objectives of the study are:

- To review the chocolate brands in the Czech market.
- To determine the influence of attributes on the price of chocolate.

3.1. Hypothesis

Based on previous research on willingness to pay for Fairtrade products (Mai 2014; Vecchio & Annunziata 2015; Rousseau 2015), we generated the following hypothesis:

H1: Fairtrade certification is the main attribute influencing higher chocolate prices.

4. Methods

4.1. Sampling Technique

This study adopted a convenience sampling technique (non-probability sampling) to select chocolate retailers. This was used because of their convenient accessibility and proximity. Therefore, all the chocolate bars available in the selected stores were collected. The survey was carried out in Prague between August and September 2022.

4.2. Type and Source of Data

A market survey was carried out in selected retail stores. The retail stores were hypermarkets (Kaufland, Albert, Billa, Tesco and Lidl) and supermarkets (Zabka, Delmart, and Green Mart). Google Spreadsheet was used in collecting the data. The chocolate products in the collection were dark and milk chocolate bars ranging from 50g to 200g. The standard for dark chocolate is to contain between 30% and 40% cocoa solids, while milk chocolate contains not less than 25% cocoa solids and milk solids between 12 and 14% (Codex Alimentarius 2016). However, different manufacturers alter the amounts of cocoa solids they utilize to generate a variety of flavours and tastes. While some increase the amounts of cocoa solids in milk, others increase the amounts in dark chocolates (Naveed 2021). 274 data entries were collected, but 272 were left for analysis after cleaning the data.

Most of the characteristics used in this study were from the previous literature (Bedell & Reed 2017). Previous studies using hedonic price model on chocolate are very limited. The only study found that has conducted such research was by Bedell et .al (2017), and the study was carried out in the United States using online retail stores. The attributes used by Bedell et .al (2017) were calories, total fat, cholesterol, salt, total carbs, protein, marketing as well as quality data, such as the kind of chocolate, whether or not it was mixed with fruit or nuts, the cocoa percentage, if it was GMO-free, whether chocolate has Fairtrade, and organic labels, brand, origin, cocoa percentage, and cocoa origin.

The other characteristics in this study that were deemed important for influencing the price were also included. The list of all the attributes selected in this study is presented

in Table 1. The retail price of chocolate (per 100 grams) is the dependent variable, and Fairtrade certification is the independent variable of interest.

Table 1: Chocolate Characteristics Variable

Quality/Marketing Attributes	Definition	Unit	Literature Source
Retail price	The retail price per 100 grams of chocolate	CZK	
Type of shop	Size of the shop	Supermarket - 1 Hypermarket - 2	
Brand Manufacturer	Name of the brand manufacturer	Name of the brand manufacturer	
Brand[2]	If the chocolate brand dominates the market	Non-Leading brand – 1 Leading brand - 2	Bedell et al. (2017)
Fairtrade[3]	Whether the chocolate bar is advertised as Fairtrade with either the black Fairtrade label or the Fairtrade Cocoa label	No - 0 Yes – 1 (either Fairtrade Cocoa label or Fairtrade label)	Bedell et al. (2017)
Rainforest Alliance (UTZ)	Whether the chocolate bar is advertised as Rainforest Alliance/UTZ	No – 0 Yes – 1	
Organic	Whether the chocolate bar is advertised as Organic	No – 0 Yes – 1	Bedell et al. (2017)
Private Ethical Label	Whether the chocolate bar is advertised with Private Ethical label such as Cocoa Life, Cocoa Plan etc.	No – 0 Yes – 1	
Chocolate type	Chocolate type	Milk – 1 Dark – 2	Bedell et al. (2017)

[2] A chocolate brand (i.e., the manufacturer) is a global leading brand if it is listed in ICCO 2023 list of main chocolate manufacturers in the world. Chocolate manufacturers on this list are global market leaders and therefore, any chocolate brand/manufacturer not included in the list are non-leading.

[3] The black Fairtrade Label indicates that all the ingredients in the chocolate that are presented as Fairtrade are certified as Fairtrade while the Fairtrade Cocoa Label shows that only the cocoa in the chocolate was sourced as Fairtrade and none of the other ingredients in the chocolate are Fairtrade certified.

Fruit/Nut	Whether the chocolate is filled with fruit/nut	No – 0 Yes – 1	Bedell et al. (2017)
Cocoa percentage	The quantity of cocoa in the chocolate bar	%	Bedell et al. (2017)
Cocoa percentage labelled	Whether the cocoa content is advertised or expressly labelled.	No – 0 Yes – 1	Bedell et al. (2017)
Flavoured	Whether the chocolate contains flavours such as strawberry	No – 0 Yes – 1	
Private Retail/Manufacturer Label	Whether the chocolate bar has private retail label or manufacturer label. Private retail labels are those belonging to retail stores such as Tesco, Lidl, Billa etc. where Manufacturer are the popular brands not owned by retail stores	Manufacturer - 0 Private - 1	
Cocoa origin labelled	Whether the origin of the cocoa is advertised and labelled	No – 0 Yes – 1	

4.3. Data Analysis

The study's first objective, describing the chocolate brands available in the Czech market, was achieved by adopting descriptive statistics such as mean and charts. The relationships between chocolate and ethical labels, the country of origin of chocolate manufacturers and their respective popular brand(s) in the dataset, the average prices for dark and milk chocolates, and the average prices for chocolates in supermarkets and hypermarkets were analysed.

The second objective was achieved using the hedonic pricing model. The hedonic model is an appropriate tool for determining the influence of different chocolate attributes on its price. This was analysed using multiple linear regression with price as the dependent variable and chocolate characteristics as the independent variables.

To determine the functional form to estimate the model, it is often pointed out that the choice should be driven by the data at hand and by the comparison of the functional forms, namely: linear, semi-log, and double-log. Out of all the three models, the semi-logarithm form is frequently used for hedonic price estimation (Maietta 2005; Roma et al. 2013; Muñoz et al. 2015; Bedell & Reed 2017). The reasons for this can be found in past studies: because some of the characteristics used in the model are dummy variables, therefore, the relationship between price and the attributes is not linear, and the coefficients are simple to interpret because the change in price by a unit change in the independent variable can be interpreted in percentage.

The models were compared using statistical measures such as R-squared, which measures the proportion of the variation in the dependent variable explained by the independent variables, and the p-value, which measures the significance of the coefficients. The model with the highest R-square is the most preferred for calculating the hedonic estimates.

The independent variables were also checked for multicollinearity using the Variance Inflation Factor (VIF) before the chosen model was applied to calculate the hedonic estimates. The Variance Inflation Factor measures the multicollinearity between predictor variables in a multiple regression model. Low multicollinearity is a desirable condition in regression analysis as it helps ensure that the estimates of the regression coefficients are reliable and not influenced by correlated predictor variables. In addition, low VIF values can also help improve the interpretation of the model by reducing the risk of unstable or misleading regression coefficients.

4.3.1. Empirical Specification of the Model

The hedonic model function displays the price a consumer will pay for chocolate, considering its cost and attributes. This price is in line with what consumers of chocolate are willing to spend on those qualities. Therefore, the retail price per 100 grams for chocolate items was factored into the hedonic model and regressed on the attributes.

The implicit model that was used in this research is given as follows:

$$\gamma = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ \ldots \ + \beta_n X_n + \beta_\rho \rho_i + \epsilon_I$$

Where γ is the retail price per 100 grams for a chocolate bar, X_1 to X_n are the attributes of chocolate as listed in Table 1. The interaction term is ρ_i, β depicts the coefficient estimates, and ϵ is a stochastic error.

4.3.2. Summary Statistics of Characteristics Variables

Table 2 provides information about the summary of numerical variables, while Table 3 summarises non-numerical variables.

Table 2. Summary Statistics of Numerical Variable

Variables	Number of Observations	Mean	Std. Dev.	Min	Max
Retail Price per 100 grams	272	50.50	25.61	14.90	199.81
Cocoa Percentage	272	46.45	19.23	13.00	90.00

Table 3. Summary Statistics of Non-Numerical Variables (Total N=272)

Variable	Frequency Table	N	%
Type of Shop	Hypermarket	194	71.3
Brand	Leading	131	48.2
Fairtrade	Full Fairtrade	6	6.3
	Fairtrade Cocoa	17	2.2
Rainforest Alliance (UTZ)	Yes	56	20.6
Private Ethical Label	Yes	114	41.9
Organic	Yes	3	1.1
Chocolate Type	Milk	137	50.4
Fruit/Nut	Yes	101	37.1
Cocoa % Labelled	Yes	88	32.4
Flavoured	Yes	38	13.9
Private Retail/Manufacturer Label	Manufacturer	234	86.0
Cocoa Origin Labelled	Yes	27	9.9

4.4. Limitations of the Study

The study has some limitations to be considered. Firstly, it did not consider other elements that could affect the price of chocolate, such as brand reputation, consumer preferences, and marketing techniques. Secondly, it did not account for the quantity of chocolate sold. Thirdly, it has a limited sample size, and the type of shops considered was also limited. Fourthly, due to the limited number of organic chocolates in the data, the result for organic chocolates might be inconclusive. Lastly, the study only looked at cross-sectional data, which may not accurately represent the dynamic nature of the chocolate market.

5. Results

5.1. Chocolate Brands and their Cost Implications

5.1.1. Certified Chocolates and Ethical Certification Labels

The share number of certified chocolates in the dataset with ethical certification labels such as Fairtrade, Rainforest Alliance, Organic, and Private Ethical labels is shown in Figure 3. Out of the 272 data used in this study, 196 have single or double certifications; for example, some Mondelez International chocolates have double certification; their internal sustainability programme label, Cocoa Life and Rainforest Alliance label but chocolates with Fairtrade labels do not have double certification. For chocolates with double certifications, the certifications were counted separately. This result shows that many chocolates in the market have ethical labels. Private ethical labels such as Cocoa Plan by Nestle, Cocoa Farming Program by Lindt and Sprungli and Cocoa Life by Mondelez International are the major labels because they have the most chocolates in the market. Figure 4 presents the logos of the internal sustainability programmes of major chocolate manufacturers.

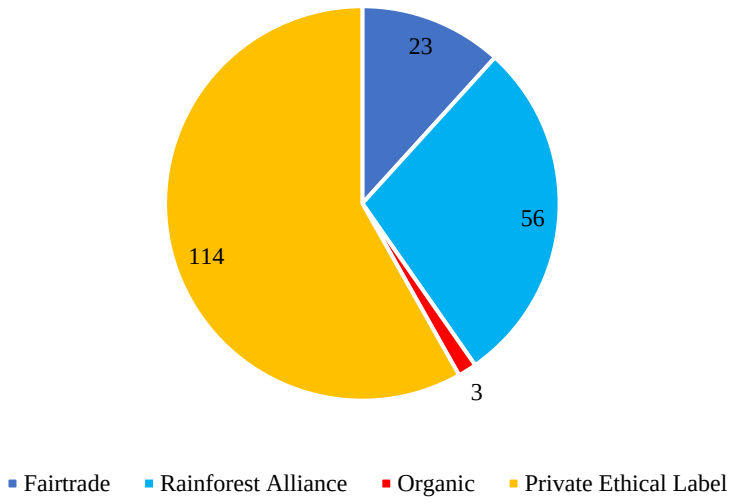

Figure 3. Share of certified chocolates that have ethical certification labels

Figure 4. Logos of Private Ethical Labels - Nestle, Mondelez International, Lindt and Sprungli, Barry Callebaut, Cargill, and Mars

5.1.2. Chocolate Manufacturers and Country of Origin

Table 4 below presents the chocolate manufacturers in the dataset, their popular brands, and their country of origin. There were 30 chocolate manufacturers. The five major retail stores in the market, Albert, Billa, Kaufland, Lidl and Tesco, have their private chocolate brands with the addition of the Delmart store.

Germany has the highest number of chocolate manufacturers in the market, followed by the Czech Republic and Switzerland. However, the varied country of origin of the manufacturers shows that chocolates in the market are not mainly from Central and Eastern Europe but also from other parts of Europe.

Table 4. Chocolate Manufacturers, their popular Brands, and their Country of Origin

Country	Name of the Manufacturer	Name of Brand
Czech Republic	Carla Spol s.r.o	Carla
	Chocoland a.s	Dianella
	Selllot s.r.o.	Sladka
	Glomex s.r.o	Taitau
Switzerland	Nestlé	Orion, Studentska
	Heidi Chocolat S. A	Heidi
	Lindt & Sprüngli AG	Creation, Excellence
	Villars Maitre Chocolatier S.A.	Villars
Belgium	Kim's Chocolate	Cachet
	Belgian Chocolate Group	Belgian
Germany	Alfred Ritter GMBH and Co	Ritter Sport
	Hanseatisches Chocoladen Kontor GmbH & Co. KG	Hachez
	Ludwig Schokolade GMBH and Co	Schogetten
	Meybona Schokoladenfabriken	Meybona
	Storck	Merci

Finland	Fazer Makeiset	Geisha
Slovakia	Lyra group	Lyra
Poland	Millano Group	Baron
Austria	Salzburger Mozarttafel	Mirabell
Italy	ICAM SpA	Vanini
	Ferrero SpA	Kinder
Croatia	Kras Prehrambena Industrija d.d	Kras
United States of America	Mondelez International	Cadbury, Oreo
United Kingdom	Chocolate and Love Ltd	Chocolate and Love

5.1.3. Number of Chocolates by the Major Brand Manufacturers

The major chocolate manufacturers and the number of brands that belong to each in the dataset are summarised in Figure 5. Nestle have the highest number of chocolates in the dataset, 45. Their popular brands include Orion, Studentska, and Orion Atelier. The second highest manufacturer with 44 chocolates is Lindt and Sprungli, and the popular brands are Excellence and Creation. The third highest manufacturer is Mondelez International, with popular brands such as Oreo, Milka and Cadbury.

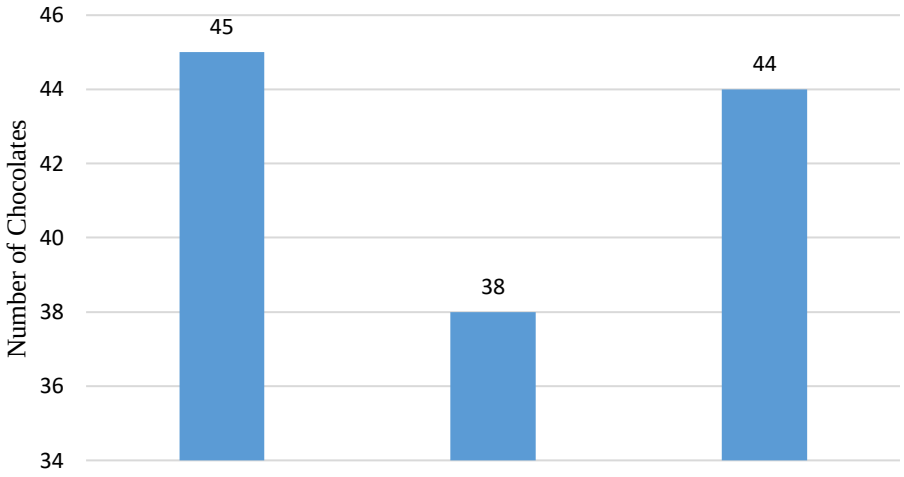

Figure 5. Number of Chocolates by Major Brand Manufacturers

5.1.4. Average Price of Ethical Labels and Others

Figure 6 shows the average price per 100 grams for chocolates with ethical labels: Fairtrade, Rainforest Alliance, Organic, and Private Ethical brands, and those without an ethical label. Organic chocolates are the most expensive, followed by chocolates with private ethical labels. Chocolates without ethical labels have an average price per 100 grams of 49.60 CZK, higher than the average price for Fairtrade, 38.27 CZK and Rainforest Alliance (UTZ), 40.77 CZK.

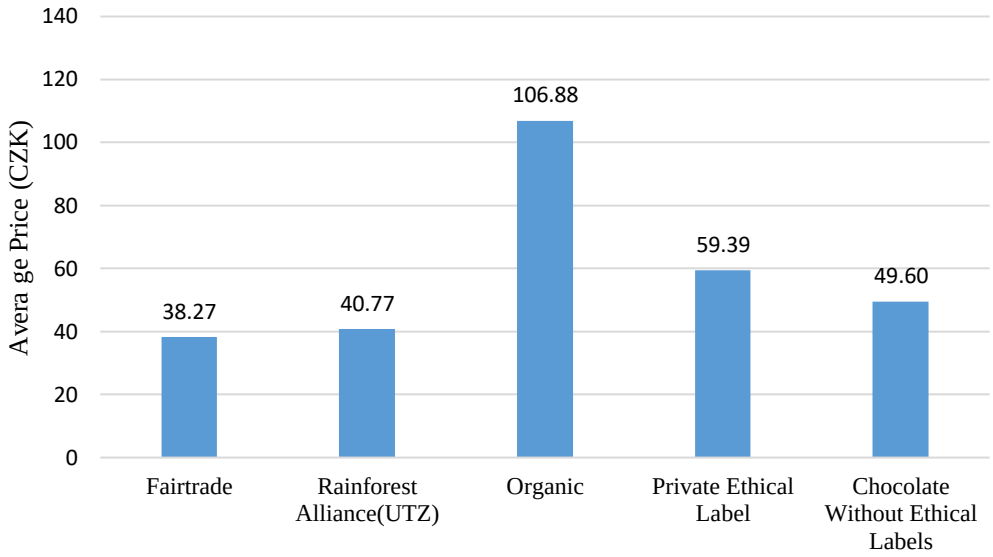

Figure 6. Average Price Per 100g of Ethical Labels and Others

5.1.5. Average Price of Chocolates in Supermarkets and Hypermarkets

The average price per 100 grams of chocolates in hypermarkets and supermarkets is presented in Figure 7. Chocolates in supermarkets are more expensive than chocolates in hypermarkets. This is because hypermarkets can sell more chocolates because of the large size of their stores, thereby enjoying the benefits of economies of scale.

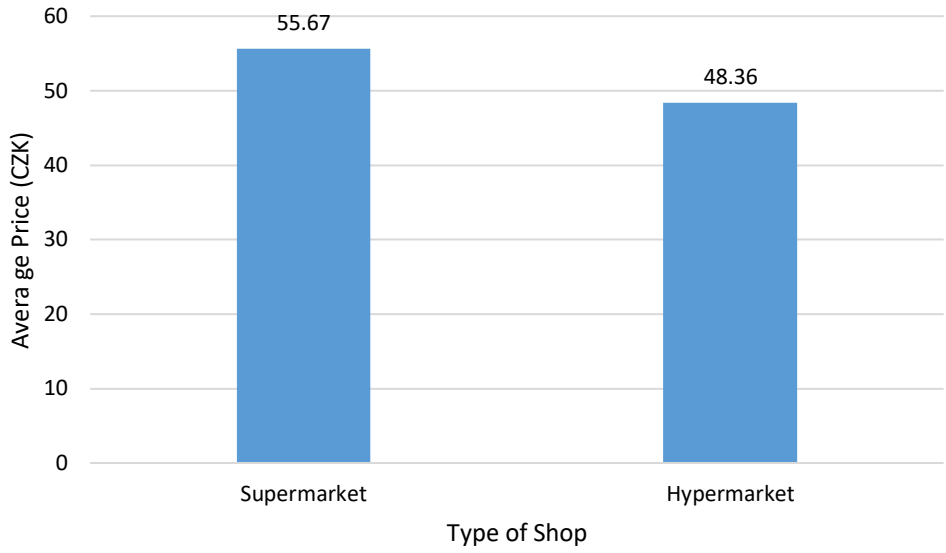

Figure 7. Average Price Per 100g for Chocolates in Supermarkets and Hypermarkets

5.2. Regression Analysis

5.2.1. Model Comparison

The three models specified were compared to determine the best and most significant model to calculate the hedonic estimates, and the results are displayed in Table 5. From the given results, the semi-log and double-log models have similar performance, with higher values for R, R Square, and Adjusted R Square than the Linear model. However, the semi-log model has a lower Standard Error of the Estimate than the double-log model. Thus, it can be concluded that the Semi-Log model is the best regression model among the three given models. This result supports past research where semi-log was preferred to other functional forms (Roma et al. 2013; Muñoz et al. 2015; Bedell & Reed 2017).

Table 5. Comparison of the Models

Model	Number of Observations	R	R^2	Adjusted R^2	Standard Error	Prob>F
Linear	272	0.67	0.44	0.41	0.20	0.0000
Semi-log	**272**	**0.73**	**0.54**	**0.51**	**0.31**	**0.0000**
Double-log	272	0.73	0.53	0.50	0.34	0.0000

5.2.2. Test for Multicollinearity of Variables

The Variance Inflation Factor (VIF) measures the multicollinearity between independent variables in a multiple regression model. VIF values above 4 indicate moderate to high levels of multicollinearity. The VIF values for the variables are represented in Appendix 1. The results show that none of the variables has a VIF of up to 4. This leads to the conclusion that there is no multicollinearity between the variables.

5.2.3. Hedonic Model Results

The results of the hedonic analysis for the chocolate characteristics regressed on the log retail price per 100 grams are presented in Table 6. The table shows the attributes that positively and negatively influence the log retail price and indicates if these characteristics are statistically significant. From the results, our variable of interest, Fairtrade, is not statistically significant; we thereby reject the hypothesis that Fairtrade certification influences higher prices of chocolate.

Table 6. Hedonic Estimate of Chocolate Characteristics on Price

Log Retail Price Per 100 Grams	**Coef.**	**Std. Err.**	**t**
Intercept	0.22	0.29	0.76
Type of Shop	**-0.14	**0.05	**-2.79
Brand	***-0.23	**0.06	**-3.68
Fairtrade	0.06	0.12	0.48
Rainforest Alliance (UTZ)	*0.15	**0.06	**2.47
Private Ethical Label	***-0.23	**0.06	**-3.83
Organic	*-0.53	**0.22	**-2.46
Chocolate Type	***0.23	**0.06	**3.89
Fruit/Nut	*-0.11	**0.05	**-2.30
Cocoa Percentage	***0.01	**0.00	**4.24
Cocoa % Labelled	**-0.20	**0.07	**-3.01
Flavoured	*-0.14	**0.06	**-2.17
Private Retail/Manufacturer Label	***-0.33	**0.10	**-3.25

Cocoa Origin Labelled	*****-0.32**	**0.08**	**-4.06**

The asterisk indicates statistical significance: * shows t-statistics at $p<0.05$; ** shows t-statistics at $p<0.01$, and *** indicates $p<0.001$.

6. Discussion

This study investigates the influence of Fairtrade certification and other characteristics on the market price of chocolate in the Czech market. The influence of these attributes, whether positive or negative, was determined using the hedonic price model with the semi-log functional form. The price per 100 grams of chocolate was regressed on the attributes to calculate the hedonic estimates and to determine the influence.

The Fairtrade certification label on chocolate bars was not statistically significant. Therefore, it does not influence the retail price. This implies that Fairtrade labels on chocolate have no contribution or impact on the price of chocolate. This result is surprising and unexpected as previous research showed a price premium for Fairtrade labelled products (Maietta 2005; Schollenberg 2012), whereas another study showed a significant discount for Fairtrade-certified chocolate (Bedell & Reed 2017).

The regular prices for Fairtrade chocolates can be due to the certification of only cocoa (Fairtrade Cocoa) used in producing some chocolates instead of certifying all the ingredients in the chocolates offered as Fairtrade (Primary Fairtrade Label). This allows chocolate companies to include Fairtrade commodities in their products, product lines, or even throughout every aspect of their business, thereby leading to the low price of certified products (Fairtrade International 2023m). Although the farmers and workers in the Fairtrade system continue to enjoy its benefits even with the use of certified cocoa by companies, the question is, is such chocolate still 100% ethical? Or is it just Fairtrade "light"? If the use of only Fairtrade Cocoa continues, what will be the future for the sugar producers in the South in the Fairtrade system?

This standard pricing of Fairtrade products aligns with discoveries by Fairtrade Foundation (2022) and SOCR CR (2022). As mentioned by Gabriela Kozlová, Head of Trade and Marketing of Fairtrade Czech Republic and Slovakia (SOCR CR 2022), Fairtrade products are now sold at regular prices as non-certified products. Fairtrade Foundation (2022) also mentioned that Fairtrade products are cheap or even cheaper than non-Fairtrade products.

This affordability of Fairtrade chocolate has led to an increase in sales. Lidl is the foremost retailer in the Czech Republic and the United Kingdom in the sale of Fairtrade products, especially Fairtrade Cocoa (Fairtrade Cesko a Slovensko 2022; Fairtrade

Foundation 2022). Lidl had more than a 90% increase in sales in 2021 from Fairtrade cocoa in the Czech Republic and sold some Fairtrade cocoa products at lower prices than similar non-Fairtrade products in the United Kingdom.

Therefore, the notion that Fairtrade products are expensive is not true. It may also be the strategy of chocolate companies for chocolates that are more up-market and have other higher qualities to have Fairtrade certification. For expensive chocolates, the certification price does not add to the margin.

In comparison, other private ethical labels, such as Rainforest Alliance, significantly impact the price by adding a premium. This finding is valuable to consumers as it will increase their willingness to pay for Fairtrade chocolates. Consumers can buy Fairtrade chocolates while fulfilling their ethical obligations to improve the lives of producers in developing countries without paying a premium price.

Although Fairtrade certification has no impact on the price, other characteristics have an impact, whether positive or negative, and such attributes will be discussed below.

The attributes that have a positive influence on the price per 100 grams are Rainforest Alliance/UTZ certification, chocolate type and cocoa percentage. Chocolates with Rainforest Alliance/UTZ certification enjoy a premium price. This means that, on average, chocolate bars marketed as Rainforest Alliance/UTZ certified have a higher price per 100 grams than those not certified by 15%. This premium can be attributed to the Sustainability Differential paid to certified farmers in addition to the market price for their crops, the Sustainability Investments, which is an additional payment in cash or in-kind to assist these certified farmers in implementing and fulfilling sustainable agricultural criteria and the cost of the certification.

Dark chocolate bars have a premium retail price of 23% more than milk chocolate bars. This finding is expected and in line with the notion that dark chocolates are preferable and better than milk chocolates because they are believed to serve as an antioxidant and that it offers other positive health benefits. This result supports the study done by Bedell et al. (2017), where dark chocolates have a price premium compared to milk chocolates. The other reason for this premium price for dark chocolates is because they are considered high-quality and, thereby, a luxury. They are, therefore, often used as gifts by consumers. In addition, because of the high cocoa content in dark chocolates, the quantity/volume produced is less than milk chocolates which require low cocoa content leading to large bulk production and, thereby, cheap prices.

As the percentage of cocoa content in chocolate bars increases, the price per 100 grams increases. This result is expected as the higher the cocoa content, the more expensive the chocolate bar. Therefore, it further supports the finding that dark chocolates are more expensive than other types of chocolates.

The characteristics that negatively impact the price per 100 grams are the type of shop, brand, private ethical label, organic, fruit or nut, flavoured, cocoa percentage labelled, private retail/manufacturer label, and cocoa origin labelled.

Organic labelled chocolate bars were found to be 53% cheaper than non-organic chocolate bars. This result is unexpected because organic chocolates have a premium price because all the ingredients in a bar of organic chocolate (milk, sugar, fruit, nut, etc.) and not only the cocoa beans should be organic before it can be marketed as organic. Because of this, the cost of production of these ingredients, processing, transportation, storage, and certification results in a high price. This negative impact and high percentage can be due to the small number of organic chocolates in the dataset. This shows that a small number of organic chocolates are being sold in hypermarkets and supermarkets. However, the results from the descriptive statistics showed that the average price for a bar of organic chocolate is more expensive than the average price of other ethically labelled chocolate or chocolate without an ethical label which is in line with past research (Maietta 2005; Schollenberg 2012; Bedell & Reed 2017). Thereby, the result for the organic attribute can be affected by biases deeming it inconclusive.

For the type of shop, the results reveal that chocolates sold in hypermarkets sell at a low price per 100 grams or 14% less than chocolates in supermarkets. In other words, the larger the shop (hypermarkets), the lower the retail price is likely to be, compared to smaller shops (supermarkets) which correlate with the results found by Munoz et al. (2015) in their study. Retailers with larger stores may offer lower prices because they can purchase products in larger quantities, take advantage of economies of scale, and negotiate better deals with suppliers. Consumers are more likely to find lower prices at larger shops but may need to consider other factors, such as distance and convenience when deciding where to shop. Retailers with smaller shops are likely to be closer to the customers even though the size of their stores is small, hence the premium on the price of chocolate in this type of shop.

There is also a cheap price for leading brands. These results show that leading brands sell at a lower price per 100 grams (23%) for their chocolate. The lower price for

leading brands might be because they enjoy the benefits of economies of scale. On average, non-leading chocolate brands like Chocoland a.s, and Carla Spol s.r.o. have a premium price per 100 grams over leading brands like Nestle, Mondelez, and Mars. This premium might be because of the increased cost needed for production, marketing etc., to penetrate the market and attract consumers. Also, these non-leading brands do not enjoy economies of scale as they produce less than the leading brands. It supports the findings by Bedell et al. (2017) in their study of a lower price for leading brands compared to non-leading brands.

Chocolate bars with private ethical labels have a lower price per 100 grams than those not marketed with such a label by 23%. This reveals that chocolate brands with labels such as Cocoa Plan by Nestle, Cocoa Life by Mondelez International etc. are cheaper because these labels are private to and controlled by the brand manufacturers themselves and not by private third-party such as Fairtrade, Rainforest Alliance and Organic. Also, because these private labels belong to the leading chocolate manufacturers, they produce large volumes of chocolates, thereby enjoying the advantages of economies of scale. Even though these manufacturers claim that their ethical labels benefit the producers and the environment, the impact is questionable because of the different criticisms against them. Such criticisms include the use of child labour on the farms by farmers in their supply chain (Howe 2021; Ungoed-Thomas 2022; Newsroom Infobae 2022), transparency about their impact report (Nieburg 2019) and deforestation (JustFood 2018; Mighty Earth 2019). As ethical consumption is about sustainable production to improve the lives of farmers in developing countries and to protect the environment, with these criticisms, the questions remains if consumers should trust these private labels and whether buying chocolates with these labels will have the desired positive impact on the cocoa farmers and the environment.

The addition of fruit or nut or flavour to chocolate bars leads to a lower retail price per 100 grams of about 11% and 14%. This result can be because fruit, nut or flavour are cheaper fillings than cocoa content in chocolates, hence the low price. Adding fruit, nut or flavour to chocolates can also be a marketing strategy of presenting different product offerings to attract consumers resulting in lower prices. However, past research by Bedell et al. (2017) found that adding fruit or nut to chocolate has a positive but non-significant impact on the price.

Chocolates whose cocoa percentage and cocoa origin are explicitly labelled are 20% and 32% less expensive than those without explicitly labelled cocoa percentage or cocoa origin. This result is unexpected as explicitly labelling the cocoa percentage and cocoa origin will help consumers make fast and better decisions, increase transparency and boost consumer trust and confidence in the brand. Therefore, one will expect such chocolates to have a premium price.

Nonetheless, it may be beneficial for chocolate manufacturers and retailers to explicitly label the cocoa percentage and cocoa origin to appeal to consumers who prioritize transparency and informed decision-making when purchasing chocolates, thereby leading to potential long-term benefits for the industry.

Chocolates that are private to retail stores such as Kaufland, Lidl, Albert, Billa and Tesco have a lower price of 33% per 100 grams. This result supports the notion that these retail stores will try to attract consumers to their products by reducing the price of chocolates that are private to them. Even though the products considered are different, in the case of Munoz et al. (2015), where they considered extra virgin olive oil, this study aligns with their finding of a negative but significant effect on the price with a discount.

7. Conclusion and Recommendation

The main aim of this study was to determine the influence of Fairtrade certification and other characteristics of chocolates on the price in an emerging market for Fairtrade products and ethical consumption, such as the Czech Republic. 272 data about the attributes of chocolates were collected from major retail stores such as hypermarkets and supermarkets by convenience sampling in Prague using Google spreadsheet. Hedonic price model using a semi-log functional form was used to determine the influence of the stated characteristics of the chocolate bars on the retail price per 100 grams.

The variable of interest, Fairtrade certification, was found not statistically significant. Therefore, the result from this study suggested that Fairtrade certification does not get a premium price or contribute to the retail price of chocolate. Consequently, the hypothesis that Fairtrade certification influences higher prices of chocolate generated for this study was rejected.

Some characteristics such as cocoa percentage, Rainforest Alliance/UTZ certification, and chocolate type positively influence the retail price of chocolate. Dark chocolate has a premium price over milk chocolate. This result was expected. Also, as the percentage of cocoa content in chocolate increases, so does the price. The positive influence of both attributes supports the belief about the health benefits associated with dark chocolates. There is also a premium with chocolates that have Rainforest Alliance certification.

Other characteristics like brand, type of shop, private retail/manufacturer label, private ethical label, fruit/nut, flavoured, cocoa percentage labelled, cocoa origin labelled, and organic negatively influence the market price of chocolate. Chocolates by leading brands such as Nestle and Mondelez International are cheaper than chocolates by non-leading brands such as Chocoland. This might be due to the increased costs incurred by the non-leading brands, such as marketing, and not benefiting from the economies of scale. Chocolates sold at hypermarkets are more affordable than those in supermarkets. Chocolates marketed with private ethical labels by the big chocolate manufacturers, such as Cocoa Plan by Nestle, Cocoa Life by Mondelez International etc., are cheaper than those chocolates without. Also, chocolates private to retail stores are cheaper than those

chocolates not private to these stores. In addition, chocolates with fruit, nut, or flavour are cheaper than those without. This can be because fruit, nut or flavour are cheaper fillings than cocoa content. In addition, the negative influence of some characteristics was unexpected. Such characteristics are cocoa percentage labelled, cocoa origin labelled and organic. Explicitly labelling the cocoa percentage and origin would be expected to increase the price as this promotes transparency and can build consumer trust in the brand. Although organic chocolates have the highest average price from the results of the descriptive statistics section of this study, which is in line with past research, their negative influence was surprising and unexpected, as past research and beliefs showed that organic chocolates enjoy a premium. This result can be due to the low number of organic chocolates in the dataset, which may adversely lead to biases in the result.

These findings can be valuable for manufacturers and retailers looking to optimize their product offerings and pricing strategies. Additionally, consumers can use this information to make more informed decisions when choosing between plain chocolate bars and those with the desired attributes.

Because Fairtrade certification has no impact on the price of chocolate, we recommend that retailers offer more Fairtrade-certified chocolates as this will allow consumers to fulfil their ethical obligations in improving the lives of farmers in developing countries and protecting the environment without paying a premium. This will, in turn, increase their willingness to pay for Fairtrade-certified chocolates.

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Appendices

1. Result of Multicollinearity

Variable	Variance Inflation Factor
Weight	1.626
Type of Shop	1.492
Brand	2.815
Fairtrade	3.115
Rainforest Alliance (UTZ)	1.718
Private Ethical Label	2.548
Organic	1.436
Chocolate Type	2.434
Fruit/Nut	1.443
Cocoa % Labelled	1.253
Flavoured	3.299
Private/Manufacturer	2.894
Cocoa Origin Labelled	1.536
Cocoa Percentage	2.525