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Stefan Thomas, Heribert Gierl

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Do Multi-Currency Price Tags Bias Price Perceptions?

By Stefan Thomas and Heribert Gierl

Retailers frequently use price labels that contain a product's price in different currencies and affix these labels to the product. In the Eurozone, multi-currency price labels contain the price in euro that must be paid in the case of purchase. Moreover, these labels contain irrelevant information for a customer in the Eurozone: the prices that have to be paid in other countries that do not use the euro (e. g., the price in Swiss franc that has to be paid in Switzerland and the price in Czech koruna that has to be paid in the Czech Republic). By doing so, retailers can standardize their price labels across countries. Some online retailers offer the option to select a currency during "check out", i. e., when the customer pays for the products in his/her online shopping cart. In this condition, an image that is similar to a multi-currency price tag appears on the screen. We investigate consumer responses to multi-currency price tags and find that consumers integrate irrelevant information about the price in foreign currencies into their price perceptions. We recommend that retailers avoid including high-denomination prices on price tags, i. e., prices in currencies with higher nominal values than the currency used in the country in which the product is offered, to avoid detrimental effects on purchase intent.



Stefan Thomas, Research Associate at the Chair of Marketing, University of Augsburg, Universitätsstrasse 16, 86159 Augsburg, Germany, phone: 0049 821 598 4048, E-Mail: stefan.thomas@wiwi.uni-augsburg.de.



Heribert Gierl, Professor of Marketing, University of Augsburg, Universitätsstrasse 16, 86159 Augsburg, Germany, phone: 0049 821 598 4052, E-Mail: heribert.gierl@wiwi.uni-augsburg.de.
* Corresponding author

1. Introduction

Imagine that a customer living in the US is looking at a coat in a store of an international retail chain. The price on the tag is listed in her/his domestic currency (USD 78.00) and in two foreign currencies (CND 107.00 and MXN 14,120.00). Do you think that s/he perceives this coat to be more expensive or cheaper in this condition compared to the condition in which the price tag displays the price only in US dollars?

1.1. Multi-currency price tags in retail practice

Currently, a great number of international retailers and nearly all fashion retailers make use of standardized multi-currency price tags. For example, the price tags used by Victoria's Secret for its lingerie line Pink in the US market display prices in three currencies (USD, GBP, and CND). In continental Europe, numerous retailers list the price in seven or even more currencies. Until now, there is no consensus among retailers about how many currencies should be displayed and how to arrange the prices. For instance, s.Oliver sorts prices according to the initial letter of the country code, and other retailers obviously sort them randomly. Some retailers accompany the price information with the country flag; other retailers use the country code to assign the prices to countries (see *Fig. 1*).

There are also online retailers that display the price of the shopping cart in a variety of currencies. In the case of purchase, the customer can choose to pay in the currency s/he prefers. For instance, on the website of chinavigation.com, the total price is displayed in numerous currencies, and the customer typically selects the currency that is valid in the country in which s/he is living.

1.2. Research question

The advantages of multi-currency price tags are twofold. On the one hand, this measure reduces labelling costs. On the other hand, it is possible to respond quickly to changes in consumer demand and transport unsold products to countries with higher demand without the need to modify the price label. However, it is unclear how consumers respond to multi-currency price tags compared to price tags that contain the price only in the domestic currency. In this paper, we focus on these consumer responses.

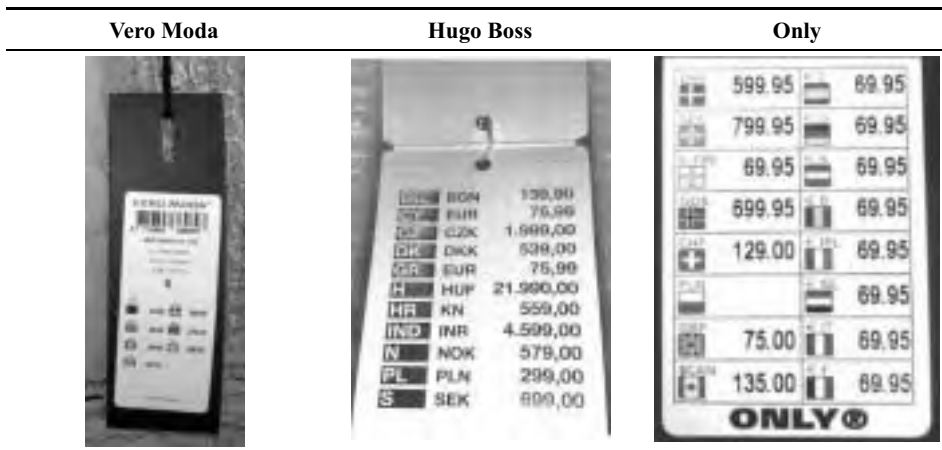


Fig. 1: Examples of multi-currency price tags

We suppose that the price perceptions of consumers are likely affected by multi-currency price tags. In general, price perceptions are the consumer's interpretation of a given price (e. g., € 100) for a certain product as low or high or, in other words, the consumer's evaluation of a product as relatively cheap or relatively expensive (Janiszewski and Lichtenstein 1999). For instance, the price in domestic currency (e. g., 100) can be paired with foreign prices in low-denomination currencies (e. g., 20, 40, 60, and 80) or with prices in high-denomination currencies (e. g., 200, 400, 600, and 800). In the Eurozone, both constellations can be found on multi-currency price tags. There are many price tags that display the price in the EUR in combination with prices in currencies such as the GBP, which is a low-denomination currency, or with currencies such as the SEK, DKK, HUF, and CZK, which are high-denomination currencies compared to the EUR.

From the perspective of information processing theories, there are two options for the way in which co-present prices in foreign currencies can bias the perception of a price as low or high. First, co-present prices in low- (vs. high-) denomination currencies could make the price appear lower (vs. higher) because low (vs. high) numbers are co-present; this effect can be denoted as *averaging*. Second, the opposite result could occur (*contrasting*) because the numbers in foreign currencies can influence the reference standard (i. e., the reference price) that is used to evaluate the domestic-currency price. Thus, the use of multi-currency price tags can have an unwanted, possibly unfavorable effect, as it may bias price perceptions negatively. An averaging effect in the case of the co-presence of foreign prices in high-denomination currencies or a contrast effect in the case of the co-presence of foreign prices in low-denomination currencies may affect price perceptions negatively (i. e., make the product appear to be more expensive), and purchase intent is likely reduced. A reduction in purchase intent would be an unwanted side effect of label standardization. This negative effect might be stronger than the positive effect due to the cost reduction achieved by the use of standardized multi-currency price labels.

To answer the question about whether an averaging or contrast effect occurs, we looked at the academic literature on consumer responses to foreign currencies.

There is ample evidence that the nominal value of money affects responses, a phenomenon that is called the "face value effect" (Raghubir and Srivastava 2002), "money illusion" (Fisher 1928; Shafir et al. 1997; Svendsäter et al. 2007) or, in more specific cases, "euro illusion" (Gamble 2006; 2007). For instance, there is research that puts consumers in a situation in which price information is presented in only one foreign currency. These studies find that consumers tend to overspend in the case of a low-denomination currency and to underspend in the case of a high-denomination currency (Desmet 2002; Raghubir and Srivastava 2002; Wertenbroch et al. 2007; Raghubir et al. 2012). The authors argue that prices have a "face value", meaning that they appear higher (vs. lower) in a high- (vs. low-) denomination currency (Gamble et al. 2002). Other authors observed that perceptions of price differences between two products are higher when the prices are expressed in high-denomination currencies than when they are expressed in low-denomination currencies (Gamble et al. 2002; Gaston-Breton 2006; Lowe et al. 2012; Lin and Fang 2013). These findings are beneficial for deriving presumptions about the bias that occurs when the domestic price is not included on the price tag, e. g., when consumers buy products abroad in foreign currencies.

However, we did not find any research that investigated the effects of the simultaneous presentation of prices in domestic currency and foreign currencies that allows us to answer our research question regarding the effects of multi-currency price tags (averaging or contrast or no effect). The answer to this question is of great relevance for marketing practitioners worldwide, as it would enable them to design multi-currency price tags with those configurations of currencies that are associated with the most favorable consumer response.

2. Theoretical background

When a consumer is exposed to a multi-currency price tag, a process of number processing is triggered. Literature on number processing suggests the existence of a two-stage process.

2.1. Two-step process of number processing

For the first stage, the holistic-number-processing model posits that when an individual is confronted with a number, s/he encodes the number and attributes a label of magnitude along an abstract mental continuum ranging from low to high (McCloskey et al. 1985; Dehaene et al. 1990). This initial encoding step is presumed to be very fast and to take place automatically (Tzelgov et al. 1992; Dehaene et al. 1993). Applied to multi-currency price tags, this model predicts that all prices, independent of domestic currency or foreign currencies, automatically cause impressions regarding number magnitude. The encoding-complex model follows Paivio's (1975) dual coding theory and suggests that the magnitude of the numbers is evaluated by accessing visuospatial and verbal information that are associatively connected (Campbell and Clark 1988; Clark and Campbell 1991). According to this view, numbers are represented in consumer memory both in visual and semantic form. When consumers have contact with the numbers on a price tag, they firstly process and store the information in pictorial form (e. g., generate a visual impression of how many digits the numbers have and of the pattern of the numbers on the tag) and then form and store a semantic representation of the prices (e. g., "one thousand" or "looks like a high price"). To sum it up, both models posit that numbers cause impressions of number magnitude; they differ regarding the question about how this magnitude information is stored in memory (which is not relevant to our study). Both models can be used to derive the presumption that co-present information about the price in foreign currencies as well as the price in domestic currency automatically cause a superficial overall impression of number magnitude.

In the second stage, mental processes that are more analytical regarding the elaboration of numbers take place. In our case, deliberate evaluations of the expensiveness of the provided price in domestic currency might be performed.

This view implies that the initial visual contact – the "scanning" of the price tag that contains unusually short/long (low/high) numbers for the foreign currencies – and the mental representation thereof cause a superficial overall impression of the expensiveness of the product. Although caused by a large amount of irrelevant information (only the domestic price is relevant), the impression that results from the first stage of the encoding process is present during the following more analytical processing step and thus can bias evaluations of the product's price. These processes are visualized in Fig. 2. Generally, the phenomenon that a superficial overall impression based on easily accessible information (in our case: small vs. high numbers) affects evaluations of a particular attribute (in our case: the perceptions of the product's price) is denoted as a halo effect (Thorndike 1920). This impression can also be interpreted as a type of priming stimulus (e. g., DeCoster and Claypool 2004).

In sum, the approaches predict that in the first step, all the information (the prices in foreign currencies and the price in domestic currency) is automatically *causing* a superficial overall impression of magnitude. In this sense, this impression is a result of averaging all the numbers included on the price tag. Next, the model predicts that in the second step, the superficial overall impression is *used* when judging the target attribute, i. e., the product's price as low vs. high. However, the approaches do not answer the question of how it is used, i. e., whether the superficial overall impression and the domestic price are averaged or whether this impression is used as a comparison standard for evaluating the domestic price.

2.2. Averaging vs. contrast

Two possible mental processes may occur that determine the direction of bias in price perceptions. In other words, there are two possibilities regarding how the superficial overall impression of magnitude actually influences price perceptions.

The averaging model suggests that consumers integrate both impressions (i. e., the first-stage superficial overall impression based on mere number processing and the second-stage impression based on the price in domestic currency) to evaluate the price. The contrast model posits that consumers use the initially developed impression as

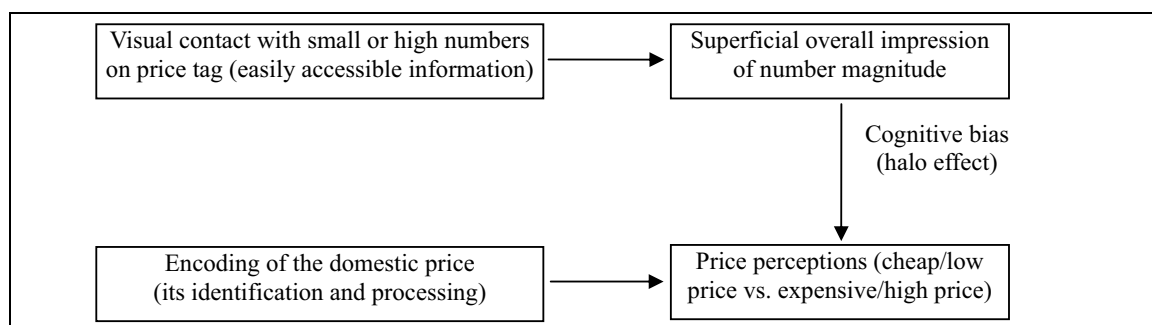


Fig. 2: Cognitive bias of price perceptions due to visual contact with small vs. high numbers

a reference price to judge the price given in the domestic currency. In both the averaging and the contrast model, the same overall impression is formed and present; the models differ only with respect to the question about how this impression is used. Averaging means that the co-presence of prices in low- (vs. high-) denomination currencies lead to lower (vs. higher) price perceptions compared to the condition of a mono-currency price tag, whereas contrasting predicts the opposite.

2.3. Hypotheses

Here, we discuss the question of which of these processes (averaging or contrasting) is predominant.

As an argument in favor of the predominance of averaging, we can refer to the fact that this process needs less cognitive effort compared to contrasting and that consumers are cognitive misers (Fiske and Taylor 1991). Averaging happens automatically because individuals cannot entirely eliminate the impact of the first-stage impression while elaborating the second-stage impression. In other words, the impression of a cheap or expensive product based on the nominal values noticed on a price tag cannot be completely ignored. As a theoretical basis, we can refer to the information integration theory by Anderson (1971; 1981). Anderson states that jointly perceived stimuli are evaluated simultaneously. Therefore, the beliefs about one stimulus (i. e., the superficial overall impression of all the numbers on a price tag) become a part of the beliefs about the other stimulus (e. g., the particular price in domestic currency). Averaging could even happen when the consumer does not look for the domestic price and ignores the currency units such as “JPY”, “CHF”, or “HUF”. The contrast process, however, requires a deliberate search for the domestic price among all the other pieces of price information. Moreover, it requires determining which impression should be used as the comparison standard (e. g., using the first-stage overall impression as a reference level) and then performing the comparison process itself.

Another argument can be found in fMRI studies. This research showed that exposure to foreign price tags in low-denomination currencies triggers an immediate reward system response in the human brain (Weber et al. 2009). This means that positive affect induced by low figures is present as a result of the first stage of processing; positive affect even due to irrelevant information is presumed to cause more favorable evaluations (i. e., lower price perceptions). As the theoretical basis for this presumption, we can refer to the “how do I feel about it” or “feelings as information” heuristic suggested by Schwarz (1990).

Because these arguments are in favor of the predominance of the averaging process, we derive and test the following hypotheses about the main effect of the price-tag version on price perceptions and the mediating effect of this version via these perceptions on purchase intent:

H1: Price perceptions are affected by the co-presence of prices in foreign currencies. When prices in high- (vs. low-) denomination currencies are co-present, the product is perceived as more (vs. less) expensive compared to the foreign-currency-absent condition (main effect).

H2: These perceptions spill over into purchase intent. In other words: Purchase intent is positively affected by the consumer's perceptions that the product's price is low (mediating effect).

Hypothesis 1 is based on the assumption that consumers do not mistrust the fact that the marketer converted the prices correctly into the different currencies by applying currently valid exchange rates, i. e., does not practice international price discrimination.

In the following Section 3, we test these hypotheses. In Section 4, we examine different variables that might moderate the relationship between price-tag version and price perceptions. We did not develop hypotheses for these moderating variables because we first have to test the main effect, i. e., whether an averaging process occurs at all.

3. Investigating the main effect of the price-tag version and the mediating effect

3.1. Experimental design

We considered three types of price tags: In the low-denomination-currency condition, the product's price in euro was shown together with four prices in currencies that have lower nominal values. In the high-denomination-currency condition, prices in currencies that have higher nominal values accompanied the price in euro. In the foreign-currency-absent condition, only the price in euro was shown. We chose the euro as the domestic currency because the study was conducted in Germany. We created these conditions for a body lotion, socks, coffee beans, a scarf, and an iPhone. We chose international brands for these products; thus, the test participants should not scrutinize the use of multi-currency price tags. To conclude, we used a 3 (price tag) × 5 (product) factorial between-subjects design.

3.2. Selection of foreign currencies

We used the actual exchange rates for the currencies that were valid at the time of the data collection. There are only a few currencies used in countries that are well-known in Germany that have lower face values than the euro, with the exception of the British pound sterling. Thus, we included the British pound in the list of low-denomination currencies and additionally looked for flags of countries and abbreviations of their currencies that are relatively unknown to avoid a bias due to favorable or unfavorable attitudes toward the respective country. In a pretest (30 students, $M_{\text{age}} = 23.8$ years, 50 % females), we presented a list of flags of countries with low-denomina-

	Low-denomination condition: Additionally displayed prices in foreign currencies with lower nominal values	High-denomination condition: Additionally displayed prices in foreign currencies with higher nominal values
Body lotion (Body Shop)		
Socks (H&M)		
Coffee beans (Starbucks)		
Scarf (Abercrombie & Fitch)		
iPhone (Apple)		

Tab. 1: Price label configurations for the test products

tion currencies and the abbreviations of their currencies and asked the participants to indicate the name of the country. We selected the Latvian lats, Bahraini dinar, Kuwaiti dinar, Azerbaijani new manat, Jordanian dinar, and the Omani rial because the proportion of test participants who stated that they knew to which country the flag and/or the currency belongs was 20 % or below. Note that we did not ask the students whether they actually were able to determine the correct country. For the high-denomination condition, several currencies could be included in the multi-currency price tags. We chose currencies of well-known countries such as Switzerland, the US, Denmark, Sweden, Japan, the Czech Republic, and Brazil and also used flags and currencies the test participants did not recognize (currencies of Serbia, Hungary, Mexico, and Lithuania). *Tab. 1* shows how we allocated foreign currencies to the test products.

3.3. Test stimuli

For the socks, the coffee beans, the scarf, and the iPhone, we used physical products as test objects and affixed a price tag containing the barcode, the brand logo, and the prices in combination with the flags of the countries. We used the euro price and four foreign currencies and varied their order on the price tag. *Fig. 3* shows the test stimuli for the coffee beans. In this example, the euro price is located at the bottom of the list of prices. In our study, we randomly varied the position of the prices on the tags because we did not find a consistent format for the order of the prices on price tags used in German retail stores that could be adopted for the experiment.

For the body lotion, we manipulated screenshots of the online shop of thebodyshop.de that differed with regard to price information. As an example, *Fig. 4* shows what

Test product	Foreign-currency-absent condition	Low-denomination condition	High-denomination condition

Fig. 3: Test stimuli for the coffee beans



Fig. 4: Test stimulus for the body lotion in the low-denomination condition

the test stimulus looked like in the low-denomination condition.

3.4. Test subjects, procedure, and measures

In total, 937 students ($M_{age} = 24.55$ years, $SD = 4.37$, 50 % females) enrolled in a university in the south of Germany participated in the experiment. Data collection took place in the summer of 2012 for the socks, in the winter of 2012/13 for the iPhone, in the winter of 2013/14 for the scarf and the coffee beans, and in the summer of 2014 for the body lotion. Because we contacted the test participants or invited them to participate in the online-survey in the context of lectures, we were able to recruit different subsamples for each of the products and avoid multiple responses by the same test participants. We asked the students to imagine that they were looking for a product in the respective category and to look at the stimulus as they would do in a real store. For the body lotion, the respondents first looked at the product in the online store and subsequently answered an online survey. We asked the test participants to indicate how cheap/expensive and how low/high they perceived the price of the product. Thus, we asked them to respond to two items, which we averaged to calculate a measure of price perceptions. The two items were moderately correlated ($r = .545$). Moreover, the test participants agreed or disagreed to the statement “would buy.” We used this item to assess purchase intent. All the scales were seven-point scales.

3.5. Results

Description of the results: The findings are summarized in Tab. 2.

Mean comparisons at the product level: At the product level, the comparisons between the price-tag variants resulted in significant differences between the low- and the high-denomination condition (with the exception of the purchase intent of the socks). However, when we compared either the low- or the high-denomination condition to the control condition in which foreign-currency prices were absent, the differences sometimes did not reach the .05 significance level. However, descriptively, the findings were stable across the products. Thus, we decided to collapse the data and test the hypotheses for the aggregated data.

Test of H1: The results indicate that the price is perceived as less expensive in the low-denomination-currency condition than in the foreign-currency-absent condition that served as a control condition ($M_{low-den} = 3.97$, $M_{control} = 3.72$, $F(1, 609) = 4.655$, $p < .05$). In contrast, the price is perceived as more expensive in the high-denomination-currency condition than in the foreign-currency-absent condition ($M_{high-den} = 3.35$, $M_{control} = 3.72$, $F(1, 610) = 10.408$, $p < .001$). The findings support H1.

Test of H2: We used the procedure developed by Preacher and Hayes (2004) to test the mediation effect of price perceptions for the price-tag/purchase-intent relationship. First, we coded 1 = low-denomination condition and 0 = control condition and found $\beta_{price\ tag \rightarrow price\ perc} =$

Product	Sample size	Price perceptions			Purchase intent		
		Low-denomination condition ¹	High-denomination condition ²	Foreign-currency-absent condition ³	Low-denomination condition ¹	High-denomination condition ²	Foreign-currency-absent condition ³
Body lotion	201	3.87 _a (1.35)	3.51 _b (1.12)	3.65 _{a,b} (1.70)	3.35 _a (1.78)	2.88 _b (1.55)	3.17 _{a,b} (2.06)
Socks	177	5.03 _a (1.07)	4.47 _b (.92)	4.84 _a (1.20)	3.78 _a (1.63)	3.37 _a (1.95)	3.34 _a (1.86)
Coffee beans	180	4.49 _a (.98)	3.65 _b (1.15)	3.96 _c (.82)	4.98 _a (1.77)	3.87 _b (1.85)	4.12 _b (1.62)
Scarf	180	3.85 _a (1.19)	2.96 _b (1.49)	3.58 _a (1.39)	4.20 _a (1.45)	2.73 _b (1.73)	3.60 _c (1.94)
iPhone	199	2.77 _a (1.31)	2.23 _b (1.06)	2.69 _a (1.20)	4.32 _a (1.76)	2.45 _b (1.15)	3.15 _c (1.87)
Overall	937	3.97 _a (1.41)	3.35 _b (1.37)	3.72 _c (1.45)	4.08 _a (1.77)	3.04 _b (1.71)	3.49 _c (1.88)

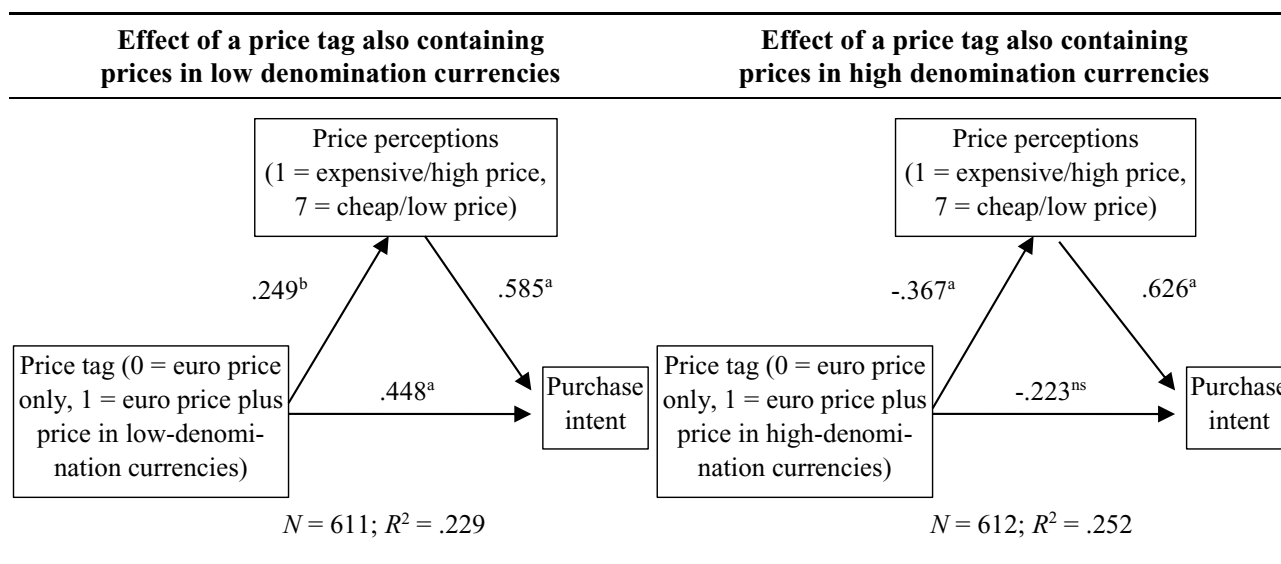
Notes:

Scales range from 1 (expensive product/high price) to 7 (cheap product/low price) and from 1 (low) to 7 (high purchase intent). Standard deviations in parentheses.

¹ Euro-price combined with prices in currencies that have lower numerical values. ² Euro-price combined with prices in currencies that have higher numerical values. ³ Euro-price only.

Means in the same row with different subscripts are significantly different at the $p < .05$ level (one-tailed test).

Tab. 2: Price perceptions and purchase intent depending on the type of price tag



^a $p < .001$, ^b $p < .05$, ^{ns} $p > .10$.

Fig. 5: Mediating effect of price perceptions due to multi-currency price tags on purchase intent

.249 ($p < .05$) and $\beta_{\text{price perc} \rightarrow \text{purchase intent}} = .585$ ($p < .001$). Second, we coded 1 = high-denomination condition and 0 = control condition and estimated $\beta_{\text{price tag} \rightarrow \text{price perc}} = -.367$ ($p < .01$) and $\beta_{\text{price perc} \rightarrow \text{purchase intent}} = .626$ ($p < .001$). These findings are shown in Fig. 5 and are consistent with H2.

The findings show that price perceptions improved when prices in foreign low-denomination currencies were co-present compared to the euro-price-only condition ($M_{\text{low-den}} = 3.97$, $M_{\text{control}} = 3.72$, $\Delta M = .249$). Purchase intent is explained by a regression-like analysis using the price-tag (binary variable) and the price-perception variable as independent variables. The mediating effect is confirmed because there is a significant effect from price-tag version on price perceptions and a significant effect from price perceptions on purchase intent. For the condition of co-present foreign prices in high-denomina-

tion currencies, price perceptions deteriorated compared to the control condition ($M_{\text{high-den}} = 3.35$, $M_{\text{control}} = 3.72$, $\Delta M = -.367$).

3.6. Interpretation

The findings indicate that consumers tend to average price information regardless of the currencies. By doing so, they perceive the price of a product as cheaper when the domestic currency is accompanied by prices in low-denomination currencies and they perceive the price as more expensive when prices in high-denomination currencies are co-present. This effect can be denoted as averaging or synonymously assimilation. The mediation analysis shows that the bias in price perceptions spills over onto purchase intent.

4. Investigating moderating variables

In this section, we investigate whether there are variables that amplify or reduce the strength of the averaging effect. We focus on five variables that potentially moderate the relationship between the nominal value of the prices in foreign currencies that are co-present on a price tag (low- vs. high-denomination currencies) and price perceptions.

4.1. Overview

First, we argue that co-present prices in foreign currencies can be considered as non-diagnostic information for evaluating a price and a product. We interpret the number of prices in foreign currencies as the amount of non-diagnostic information that likely affects the strength of the averaging effect.

Second, we analyze the effect of the sequence of the prices (ascending vs. descending order of the nominal values of the prices) on the size of the averaging effect. We consider the sequence as a moderating variable because prior research found that pieces of information that are presented first gain higher attention by recipients.

Third, we investigate whether consumer cosmopolitanism affects the extent of the averaging effect. We do this because consumers with a strong cosmopolitan orientation might be more accustomed to different currencies and hence could probably control for the influence of prices expressed in foreign currencies when evaluating a product's price and considering its purchase.

Fourth, we intend to answer the question about whether the fact that consumers are more familiar with foreign currencies such as USD or CHF and less familiar with foreign currencies such as OMR or BHD affects the extent to which consumers include co-present information about prices in foreign currencies in their evaluations.

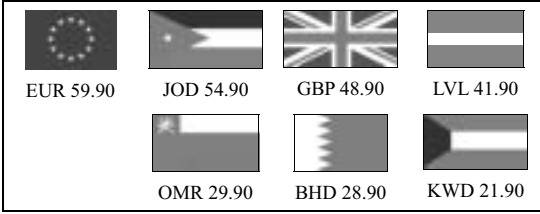

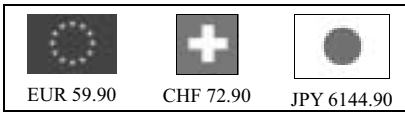
Fifth, we examine whether the difference in the nominal values affects the resulting averaging effect. For instance, when a price tag contains the price in EUR and CHF, the difference of the nominal values is low. When it shows the EUR price and the price in JPY, the nominal difference is very high. Research on assimilation vs. contrast suggests that the extremeness of the differences might impact cognitive biases.

4.2. Number of prices in foreign currencies depicted on the price tag

Effect of the amount of non-diagnostic information: In the field of research on the dilution effect, researchers distinguish between diagnostic and non-diagnostic information for assessing a target attribute. For instance, Nisbett et al. (1981) asked test subjects to judge the probability that an unknown person is a pedophile (target attribute) and manipulated the number of pieces of available information that are suitable for inferring this tendency (e. g., he is an alcoholic and was sexually abused by his

stepfather) and the number of pieces of information that have no predictive quality for this assessment (e. g., he is lacking two fingers at his left hand and he is a manager of a DIY market). They found that the estimated likelihood that this person is a pedophile decreased with an increasing amount of non-diagnostic information. Peters and Rothbart (2000) asked students to estimate the number of textbooks that a fellow student is reading during his time in college (target attribute). They identified pieces of information that students regard as diagnostic for this attribute and information that is considered as non-diagnostic (e. g., the fellow student uses the bus, prefers McDonald's over Burger King; is from Portland, Oregon; has short hair; and is overweight). The authors found that with an increasing amount of non-diagnostic information, the estimate of the target attribute approached the estimate in the control condition in which neither diagnostic nor non-diagnostic information was available. Such findings indicate that individuals form an average impression based on both diagnostic and non-diagnostic information to infer the target attribute; the impact of non-diagnostic information increases with its amount. There are two main explanations for the reason why the bias in the target attribute's evaluation increases with the amount of non-diagnostic information. First, we can refer to the representativeness heuristic proposed by Kahneman and Tversky (1972). This heuristic suggests that the likelihood that an object is assigned to a certain category is positively related to the amount of information that is diagnostic for that category and is negatively related to the amount of information that is non-diagnostic for that category. Second, some researchers presume that "subjects (are) not able to ignore nondiagnostic information and, thereby, (do) not perform (as) expected" (Troutman and Shanteau 1977, p. 52). Waller and Zimbelman (2003, p. 255) conclude that the effect of this process is that diagnostic information is weighted less in the nondiagnostic-information-present than in the non-diagnostic-information-absent condition. Similarly, Anderson (1974, p. 239) argues that individuals try to process any co-existing information. Thus, this approach predicts that a higher (vs. lower) number of co-existing non-diagnostic information causes a stronger (vs. weaker) bias regarding the assessment of the target attribute. However, there are also results in prior research indicating that the size of the effect of non-diagnostic information is not contingent on the amount of non-diagnostic information (Ruth and Simonin 2006). Other researchers provided inconsistent findings (Smith et al. 1998/99).

Transfer to multi-currency price tags: In our case, the perception of a product's price as low vs. high is the target attribute. The price expressed in domestic currency is diagnostic information, and the co-present information about prices in foreign currencies is non-diagnostic. The number of prices in foreign currencies reflects the amount of non-diagnostic information. Based on the presumption that the averaging effect increases with the amount of non-diagnostic information, one might expect

Number of co-present foreign currencies	Low-denomination condition: Additionally displayed prices in foreign currencies with lower nominal values	High-denomination condition: Additionally displayed prices in foreign currencies with higher nominal values
	Six	
Two		

Tab. 3: Price label configurations for testing the moderating effect of the number of foreign-currency prices

that the averaging effect is stronger (vs. weaker) for a higher (vs. a lower) number of prices in foreign currencies depicted on a price tag.

Experimental design and test product: We used a 2 (price tag: two vs. six prices in foreign currencies co-present) × 2 (denomination of the foreign currencies compared to the domestic currency: lower vs. higher) + 1 (control condition: domestic price only) between-subjects design. As the test product, we used a unisex scarf.

Test stimuli: The test participants had contact with a screenshot of an online shop offering this scarf. Next to the product image, the price information was provided. For the four foreign-currency-present conditions, we depicted the price information shown in Tab. 3. As in the study described above, the sequence of the prices was randomized. In the control condition, the screen shot indicated the price only in euro.

Test subjects, procedure, and measures: Overall, 259 students ($M_{age} = 23.98$ years, $SD = 6.74$, 51 % females) took part in this experiment. The procedure and the measures were adopted from the study described in Section 3.

Results: Tab. 4 contains the price perceptions and the purchase intent depending on the experimental conditions.

First, we focus on the effect of the manipulation on price perceptions and consider the condition of a high number of co-present foreign-currency prices. When six prices in low-denomination currencies are co-present, the price appears to be cheaper than in the foreign-currency-absent condition ($M_{six, low-den} = 3.83$, $M_{control} = 3.15$, $F(1, 131) = 13.135$, $p < .001$). When six prices in high-denomination currencies are co-present, the price appears to be less cheap ($M_{six, high-den} = 2.74$, $M_{control} = 3.15$, $F(1, 131) = 3.792$, $p = .054$, two-tailed test). These findings provide additional support for *H1*. Next, we compare the condition of six to the condition of two co-represent foreign-currency prices for the low-denomination condition ($M_{six, low-den} = 3.83$, $M_{two, low-den} = 3.27$, $F(1, 94) = 6.728$, $p < .05$) and for the high-denomination-condition ($M_{six, high-den} = 2.74$, $M_{two, high-den} = 2.65$, $F(1, 94) = .141$, ns). These findings indicate a weaker averaging effect when a smaller (vs. higher) number of prices in foreign low-denomination currencies are co-present.

Second, we use purchase intent as the dependent variable. Compared to the control condition, we find an effect only when six prices in foreign high-denomination currencies are co-present ($M_{six, high-den} = 1.97$, $M_{control} = 2.51$, $F(1, 131) = 5.106$, $p < .05$). An explanation for the observation that there are only small effects could be the

Number of co-present foreign currencies	Sample size	Price perceptions			Purchase intent		
		Low-denomination condition	High-denomination condition	Foreign-currency-absent condition	Low-denomination condition	High-denomination condition	Foreign-currency-absent condition
6	132	3.83 _a (.88)	2.74 _c (1.15)	-	2.76 _a (1.39)	1.97 _c (1.29)	-
2	60	3.27 _b (1.20)	2.65 _c (1.04)	-	2.47 _{a,b} (1.41)	2.20 _{b,c} (1.16)	-
0	67	-	-	3.15 _b (1.26)	-	-	2.51 _{a,b} (1.45)

Notes: Scales range from 1 (expensive product/high price) to 7 (cheap product/low price) and from 1 (low) to 7 (high purchase intent). Means for the same dependent variable with different subscripts are significantly different at the $p < .05$ level (one-tailed tests).

Tab. 4: Price perceptions and purchase intent depending on the nominal values and the number of co-present foreign-currency prices

fact that the intent to purchase the scarf was generally rather low in the sample.

Interpretation: For the low-denomination condition, we found that a higher number of foreign-currency prices resulted in more favorable price perceptions than a lower number. This finding is consistent with the research indicating that the strength of the dilution effect depends on the amount of non-diagnostic information (Nisbett et al. 1981; Peters and Rothbart 2000). However, for the high-denomination condition, we found no effect of the number of foreign-currency prices: A low number of high-denomination foreign-currency prices produced the same unfavorable effect as a high number of such prices. An explanation for this result can be found in theories about the existence of a negativity bias (e. g., Herr et al. 1991). A low amount of negative information (even when the information is non-diagnostic such as in the case of prices in foreign high-denomination currencies) may be sufficient to elicit an unfavorable response, whereas a low amount of positive information (even when the information is non-diagnostic such as in the case of prices in foreign low-denomination currencies) has no effect.

4.3. Ascending versus descending sequences of prices in different currencies

Sequence effect: Prior research suggests the existence of a sequence effect. It exists when the order in which information is noticed by the recipient affects behavior and evaluations. Generally, two levels of the sequence effect are discussed: the primacy and the recency effect. The sequence effect manifests itself in the primacy effect if the object presented in the left position (when the objects are arranged in a column-like, horizontal order) or in the top position (when the objects are arranged in a row-like, vertical order) gains a surplus of attention or preference merely due to these positions. The recency effect, which is an alternative manifestation of the sequence effect, exists if an object in the right position or in the bottom position gains a surplus of attention or preference due to those locations. Murphy et al. (2006) tested the sequence effect in an online environment. They arranged six Internet links in a row-like, vertical order on the website of a particular restaurant. Clicking on a link provided detailed information about the restaurant's offerings, its location, local attractions, and so forth. The authors found support for the primacy effect: The link located at the top of the website was used most frequently independent of which information was announced when clicking this link. In a similar study, Leesch et al. (2010) presented seven second-hand cars of the Audi brand in a horizontal order. In one of the experimental conditions, the presentation showed the car with the highest horse power on the left side and the other cars in descending order with regard to horse power. In the control condition, the order of the cars presented in horizontal order was randomized. The authors tested the presumption that products shown in the left or in the right position in the sequence are chosen more frequently than products presented in the middle of

the sequence. However, their data did not provide evidence for this presumption. In summation, prior research yielded mixed findings regarding whether and which sequence effects occur when objects are presented simultaneously but are shown in a special order.

Transfer to multi-currency price tags: To provide insights into the sequence effects of prices shown on multi-currency price tags, we manipulated the order in which the information about the prices in foreign currencies was displayed. When the primacy effect exists, the following is expected: The averaging effect is higher when the domestic price is presented in the last position. In contrast, when the recency effect exists, one expects to find the following: The averaging effect is higher when the domestic price is shown in the first position. Note that we adopt the study designs of Murphy et al. (2006) and Leesch et al. (2010) to examine the sequence effects.



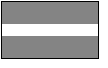




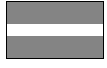












Experimental design and test product: We used a 2 (price tag: descending or ascending order of the prices) \times 2 (denomination of the foreign currencies compared to the domestic currency: lower vs. higher) + 1 (control condition: domestic price only) between-subjects design. As the test product, we used a low-priced, digital, unisex wrist watch (Lava Style Iron Samurai).

Test stimuli: The wrist watch was contained in transparent packaging. The price tag was attached to the packaging. The prices were listed in a vertical, row-like order. The price information provided in the four experimental conditions is shown in Tab. 5.

Test subjects, procedure, and measures: Overall, 300 students ($M_{\text{age}} = 23.34$ years, $SD = 2.89$, 51 % females) participated in this experiment. The procedure and the measures were adopted from the study described in Section 3.

Results: Tab. 6 presents price perceptions and purchase intent according to the conditions. The data provide additional support for the averaging hypothesis stated in *H1*. When we investigate the role of the sequence of prices in the low-denomination condition, we find a sequence effect neither on price perceptions ($M_{\text{desc, low-den}} = 4.48$, $M_{\text{asc, low-den}} = 4.37$, $F(1, 118) = .196$, ns) nor on purchase intent ($M_{\text{desc, low-den}} = 3.48$, $M_{\text{asc, low-den}} = 3.12$, $F(1, 118) = 1.348$, *NS*). For the high-denomination condition, a null effect of the sequence was also observed for price perceptions ($M_{\text{desc, high-den}} = 3.43$, $M_{\text{asc, high-den}} = 3.22$, $F(1, 118) = .786$, ns) and for purchase intent ($M_{\text{desc, high-den}} = 2.32$, $M_{\text{asc, high-den}} = 2.07$, $F(1, 118) = .817$, ns).

Interpretation: We did not find a systematic effect of the sequence of the prices displayed on the multi-currency price tags. As the number of the prices was rather low (five prices), we presume that the consumers were able to notice and process all the prices simultaneously. However, if a higher number of prices were included on a price tag, sequence effects might occur. We were not able to test such sequence effects systematically when a rather high number of foreign prices is co-present on a price tag because at present there are only few currencies with a

Position	Low-denomination condition: Additionally displayed prices in foreign currencies with lower nominal values		High-denomination condition: Additionally displayed prices in foreign currencies with higher nominal values	
	Descending order	Ascending order	Ascending order	Descending order
Top position	 EUR 8.99  GBP 7.99  LVL 5.99  BHD 3.99  KWD 2.99	 KWD 2.99  BHD 3.99  LVL 5.99  GBP 7.99  EUR 8.99	 EUR 8.99  CHF 10.99  BGN 18.99  SEK 77.99  HUF 2599	 HUF 2599  SEK 77.99  BGN 18.99  CHF 10.99  EUR 8.99
Bottom position				

Tab. 5: Price label configurations for testing the moderating effect of the sequence of foreign-currency prices

Order of the nominal values of the currencies	Sample size	Price perceptions			Purchase intent		
		Low-denomination condition	High-denomination condition	Foreign-currency-absent condition	Low-denomination condition	High-denomination condition	Foreign-currency-absent condition
Descending	120	4.48 _a (1.50)	3.43 _b (1.35)	-	3.48 _a (1.65)	2.32 _{b,c} (1.61)	-
Ascending	120	4.37 _a (1.39)	3.22 _b (1.32)	-	3.12 _a (1.80)	2.07 _b (1.41)	-
	60	-	-	3.87 _c (1.36)	-	-	2.57 _c (1.23)

Notes: Scales range from 1 (expensive product/high price) to 7 (cheap product/low price) and from 1 (low) to 7 (high purchase intent). Means for the same dependent variable with different subscripts are significantly different at the $p < .05$ level (one-tailed tests).

Tab. 6: Price perceptions and purchase intent depending on the nominal values and the sequence of co-present foreign-currency prices

lower denomination compared to the euro (Exchange-rates 2015).

4.4. Moderating effect of consumer cosmopolitanism

Consumer cosmopolitanism: Merton (1957) introduced the concept of cosmopolitanism into research. Generally, this concept describes an individual's tendency to focus on local versus global issues. Skrbis et al. (2004, p. 117) define the concept as "a conscious openness to the world and to cultural differences." In marketing research, this concept is used to predict preferences for national vs. foreign products. According to Riefler and Diamantopoulos (2009), a consumer's orientation with regard to cosmopolitanism is a result of travel behavior, expatriate stays, cross-cultural training, and social status seeking and affects the consumer's evaluations of domestic and foreign products and their willingness to buy these products. We posit that consumers with a low level of cosmopolitanism are less familiar with foreign currencies and thus

might have more difficulties distinguishing the diagnostic price information (price in domestic currency) from the non-diagnostic information. This presumption predicts that the averaging effect is stronger for low-cosmopolitanism consumers.

Study details and results: The questionnaires used in the study presented in Section 3 also included statements that aimed to measure consumer cosmopolitanism. The data were collected in the case of the socks, the coffee beans, the scarf, and the iPhone. For the body lotion, we did not include these statements in the questionnaire. Thus, the sample size was reduced from 937 to 736 due to missing data for the body lotion. Moreover, four test participants did not provide data that could be used to calculate cosmopolitanism. We used a short form of the scale that was developed by Cannon et al. (1994) and asked the test participants to agree or disagree with the following statements: "Foreigners often leave me uncomfortable" (recoded), "I wish I could speak at least one foreign language", "I like to have contact with peo-

Consumer cosmopolitanism	Sample size	Price perceptions			Purchase intent		
		Low-denomination condition	High-denomination condition	Foreign currency-absent condition	Low-denomination condition	High-denomination condition	Foreign-currency-absent condition
Low	386	4.09 _a (1.38)	3.39 _b (1.36)	3.68 _c (1.38)	4.38 _a (1.74)	3.41 _b (1.88)	3.77 _b (1.85)
High	346	3.90 _a (1.47)	3.21 _b (1.49)	3.83 _a (1.45)	4.24 _a (1.69)	2.84 _b (1.63)	3.21 _c (1.80)

Notes: Scales range from 1 (expensive product/high price) to 7 (cheap product/low price) and from 1 (low) to 7 (high purchase intent). Means in the same row with different subscripts are significantly different at the $p < .05$ level (one-tailed test).

Tab. 7: Price perceptions and purchase intent depending on the nominal values of the foreign-currency prices and the cosmopolitanism of the consumers

ple from different cultures”, “World issues concern me more than the issues of any one country”, and “I like immersing myself in different cultural environments” (seven-point scale, $\alpha = .710$). We performed a median-split of the resulting cosmopolitanism variable and conducted two-way ANOVAs including this variable and the price-tag version as the independent variables and price perceptions and purchase intent as the dependent variables (i. e., one ANOVA for each dependent variable). However, we found neither an interaction effect of consumer cosmopolitanism and price-tag version on price perceptions ($F(2, 726) = 1.067, p > .30$) nor an interaction effect on purchase intent ($F(2, 726) = 1.135, p > .30$). The detailed results are presented in Tab. 7.

Interpretation: We found no moderating effect of consumer cosmopolitanism on the strength of the averaging effect suggested in *H1*. We presume that there was no effect because our sample consisted of students who generally are more open to foreign cultures than other consumer segments. Another reason could be due to the widespread use of multi-currency price tags in retail. Consumers might be accustomed to this pricing tool independent of their level of cosmopolitanism.

4.5. Familiarity with different foreign currencies

Even consumers from Germany with a high level of cosmopolitanism might have difficulties allocating currencies such as HUF, BHD, or KWD to the correct countries, whereas it might be easy even for low-cosmopolitan consumers to assign currencies such as CHF, USD, and GBP to their countries. It is probably that the averaging effect due to multi-currency price tags is stronger when a large proportion of familiar foreign-currency prices are shown on a multi-currency price tag because familiar currencies might gain more attention than foreign currencies.

However, we could not manipulate familiarity with different foreign currencies systematically. The reason for this is as follows: In all the low-denomination conditions considered in the studies presented above, GBP was a familiar currency and the other currencies were classified as less familiar (AZN, BHD, JOD, KWD, LVL, and OMR). As already mentioned above, there are only few real currencies with lower nominal values compared to the euro. This limits the possibilities for analyzing the

moderating effect of familiarity with different currencies on the size of the averaging effect.

In the experiments we conducted to compare the effect of multi-currency price tags containing foreign prices in high-denomination currencies, there are two experiments in which *one-half* of the foreign prices are provided in familiar currencies (CHF and USD) and the other half are provided in less familiar currencies. The products considered in these two experiments were the body lotion of the Body Shop brand and the iPhone of the Apple brand (high-familiarity condition). Moreover, there are four experiments in which *one-quarter* of the prices are given in a familiar currency (CHF) and three quarters of prices are given in less familiar currencies. In these experiments, the socks (H&M), coffee beans (Starbucks), the scarf (Abercrombie & Fitch), and the wrist watch (Lava Style Iron Samurai) were used as the test products (low-familiarity condition). When we compare the results for the low- to the high-familiarity condition on the basis of the subscripts that indicate the significance or non-significance of the mean differences (see Tab. 2 and Tab. 6), we did not find evidence that the averaging effect caused by the high-denomination multi-currency price tags is contingent on the proportion (one-half vs. one-quarter) of foreign-currency prices that are familiar to the consumer.

4.6. Extremeness of nominal values of foreign-currency prices

Averaging vs. contrasting depending on the extremeness of non-diagnostic information: Researchers suggest that the averaging (or assimilation) and the contrast effects mentally co-occur when relevant information is accompanied by irrelevant (context) information (Wänke et al. 2001) and only the net effect can be observed. Moreover, prior research found support for the averaging model when the focal and the context stimulus were similar and for the contrast model when they strongly differed (Sherif et al. 1958; Herr 1986; Meyers-Levy and Sternthal 1993; Mussweiler 2003).

Transfer to multi-currency price tags: In our case, the focal stimulus is the domestic price and the context stimuli are the prices in foreign currency. This stream of research predicts an averaging effect when the nominal prices in foreign currency do not strongly differ from the

nominal price in domestic currency and a contrast effect when the nominal values of the prices in foreign currency are strongly different from the nominal value of the price in domestic currency.

Results: Although we did not systematically manipulate the degree of these differences, we can use our sample of test products to provide evidence that the averaging process even exists or is predominant when the nominal values of the currencies are highly different. For instance, we observe averaging for coffee beans (EUR 5.50, maximum nominal value in foreign currency: MXN 92.50). In this case, the difference between the minimum and the maximum value was comparatively low. However, we also observe averaging for the socks (EUR 5.99, maximum nominal value in foreign currency: HUF 1671.72) and for the wrist watch (EUR 8.99, maximum nominal value in foreign currency: HUF 2599). In these conditions, the difference between the minimum and maximal value was very large.

Interpretation: We presume that the contrast effect was inhibited in our cases by the way that the price information was presented on multi-currency price tags. In the studies that confirmed the assimilation-contrast-effect, the irrelevant (context) information is presented prior to the relevant information. In our case, all the prices were presented simultaneously rather than subsequently, which might have inhibited the occurrence of the contrast effect.

5. Illustration of the key findings

The experiment described in Section 3 showed the *existence* of an averaging effect due to multi-currency price tags. The additional studies and data analyses described in Section 4 that aimed to identify and test moderating variables with respect to the *size* of the averaging effect did not provide much additional insight. We did not find moderating effects of the sequence of the price information, the cosmopolitanism of the consumers, the consumers' familiarity with different foreign currencies, and the extremeness of the nominal values of foreign currencies. The only moderating variable on the size of the averaging effect was the number of co-present prices in foreign currencies. For a low number of prices in foreign low-denomination currencies (only two foreign prices), we found no averaging effect (Fig. 6). An interpretation of this specific finding has already been provided in Section 4.2.

6. Limitations

Our study reveals significant effects of multi-currency price tags. However, the size of these effects is rather small.

First, this could be due to the test products. In our study, we focused on products and brands that are well known by and of interest to the students in our sample. The effects might be greater for unknown brands and less fre-

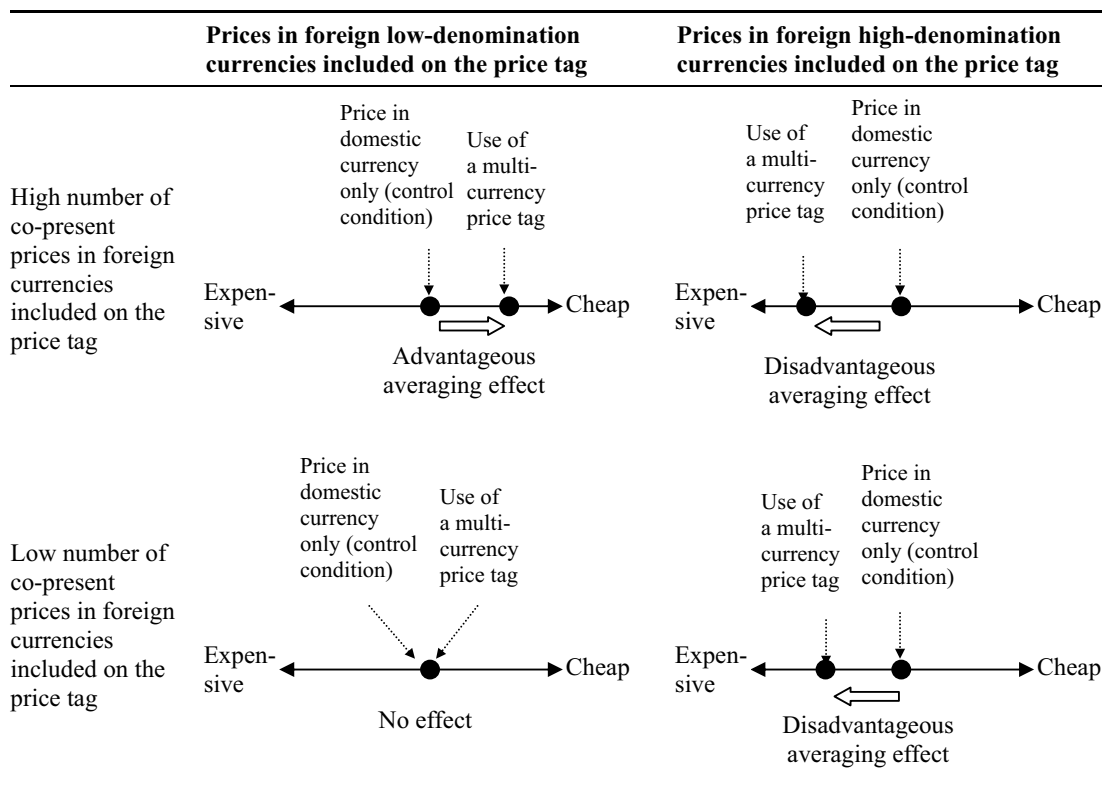


Fig. 6: Overview of the main results

quently purchased products because price knowledge is lower in such cases. This presumption is supported by the observation of comparatively strong effects in the case of the wrist watch of an unknown brand (Section 4.3.).

Second, our experimental setting might have affected the size of the effects. In our study, the test participants had to focus on only one product and judge its expensiveness. Thus, they might have strongly focused on the price of this product enabling them to reduce the bias due to the presence of prices in foreign currencies. In most in-store settings, consumers normally compare the prices of two or more products and thus are distracted from elaborating intensely on price information; in this condition, the observed bias in price perceptions might be higher.

Third, in our study we did not consider whether the test participants suspected that the retailer applies an international price discrimination strategy, e. g., whether they presume that the product is sold at a higher price in the Eurozone than in other countries when the actual conversion rates are taken into account.

Fourth, based on our research, we cannot answer the question of what happens when high- as well as low-denomination currencies are listed on the same price tag.

7. Implications for theory

There is ample evidence that bias occurs when individuals are exposed to a price in foreign currency as a piece of highly diagnostic information about the product's expensiveness. These studies indicate the relevance of the "face value" of money, i. e., the bias due to the nominal value of the price in foreign currencies. Our study considers the effect of prices in foreign currencies when these prices are a piece of non-diagnostic or irrelevant information about the product's expensiveness. Thus, our study contributes to the research on consumer responses to irrelevant information. Because we found support for the averaging process, we conclude that consumers misinterpret co-present price information in low- (vs. high-) denomination currencies as pieces of favorable (vs. unfavorable) information about the product's price and use this information to some extent to form an average impression, which is consistent with the averaging model.

8. Implications for marketing practice

Our findings suggest that multi-currency price tags affect consumer responses, although marketers likely use these tags for their own convenience, e. g., for reducing cost by using uniform labels. When marketers of international brands or retailers intend to affect consumer responses by using multi-currency price tags, they should choose different labels for each country in order to ensure that the nominal value of the price in domestic currency is

higher compared to all the price values in foreign currencies displayed on the price tag. Marketing practitioners should at least refrain from including prices in currencies with considerably higher nominal values than the price in domestic currency. To conclude, we offer the following recommendations:

(1) Retailers should generally *avoid* using multi-currency price tags that contain only high-denomination foreign-currency prices (e. g., the EUR price and prices in currencies such as the SEK, DKK, CZK, or JPY) when they intend to sell their products in the Eurozone and the costs of producing mono-currency price labels are rather low.

(2) Retailers might use price tags containing a large number of prices in low-denomination currencies (e. g., the EUR price and a large number of additional prices in currencies such as the BHD, KWD, AZN, JOD, and OMR). Latvia recently joined the Eurozone, and thus the LVL is no longer an option as a low-denomination price. However, retailers rarely target the Eurozone and countries such as Bahrain, Kuwait, Azerbaijan, Jordan, and Oman. Thus, this strategy generally seems to be *unsuitable*.

(3) Currently (summer 2016), the USD and the CHF are high-denomination currencies compared to the EUR (1 EUR = 1.12 USD and 1 EUR = 1.09 CHF). Moreover, the GBP is a low denomination currency (1 EUR = .85 GBP). Our results suggest that a mixture of prices with slightly higher and slightly lower nominal values might eliminate opposing averaging effects. Thus, our results do not evoke concerns when multi-currency price-tags contain prices in EUR, CHF, USD, and GBP.

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Keywords

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