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## COUNTRY-OF-ORIGIN, BRAND IMAGE AND BRAND LOYALTY OF BRANDED DRUGS IN HO CHI MING CITY, VIETNAM

Raymond Cheng,  
La Thi Hong Loan,  
Nguyen Thai Hoa

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### ABSTRACT

*While there has been numerous previous empirical studies investigating into a product's country-of-origin (COO) and its relationship with various factors, including but not limited to brand loyalty, brand awareness and perceived quality, the findings were often inconsistent and differ from country to country (Kaynak & Kara, 2000). This is especially true when it comes to the pharmaceutical industry in which the importance of COO seems to depend on the type medicine studied and its use in addition to the usual factors for other non-medicine products (e.g. perceived quality, product evaluations other than quality, affect, and purchase intentions). This paper aims to look at the pharmaceutical market of Vietnam by studying the people's brand awareness, brand loyalty, perceived quality and preferences toward COO of branded drugs available in the Ho Chi Ming City. Results show that Vietnamese, unlike Americans (as in Quelch's (1997) Aspirin experiment), tend not be biased by brands but rather the COO, implying a very different market than some of its Asian neighbors.*

**Keywords:** Vietnam pharmaceutical industry, brand awareness, perceived quality, brand loyalty, country-of-origin

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### INTRODUCTION

According to the Vietnam Ministry of Health, the Vietnam pharmaceutical market in 2013 was valued at approximately US\$2.775 billion. In a similar study in 2016<sup>1</sup> this figure hopped up to US\$3.5 billion (2015 figure) and is expected to reach some US\$6.6 billion by 2020 with an astonishing compound annual growth rate of some 16%<sup>2</sup>. In fact, pharmaceutical product imports for Vietnam has always remained high and is reported to be catering for some 60% of the total domestic pharmaceutical demand (Nguyen, 2014). In 2015, pharmaceutical imports alone reached US\$2.3 billion, with France (US\$275 million) and India (US\$267 million) being the two largest importers of drugs, followed by Germany, Korea and Italy (see Figure 1 below).

**Figure 1.** Top drug import market of Vietnam 2015.

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<sup>1</sup> See the ThePharmaLetter.com article, 'Vietnamese pharma market to reach \$6.6 billion by 2020', dated July 20, 2016, accessible at <https://www.thepharmalletter.com/article/vietnamese-pharma-market-to-reach-6-6-billion-by-2020>

<sup>2</sup> Source: VRAC

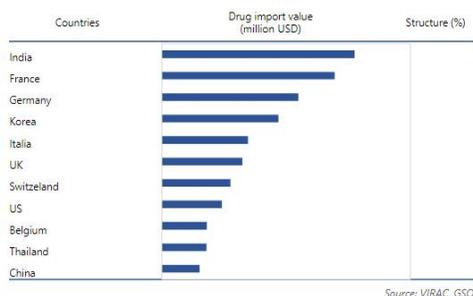


Figure 2. US Dollar to Vietnamese Dong (VND) and Chinese Yuan to VND, 2010-2015. Source: VIRAC & Bloomberg.



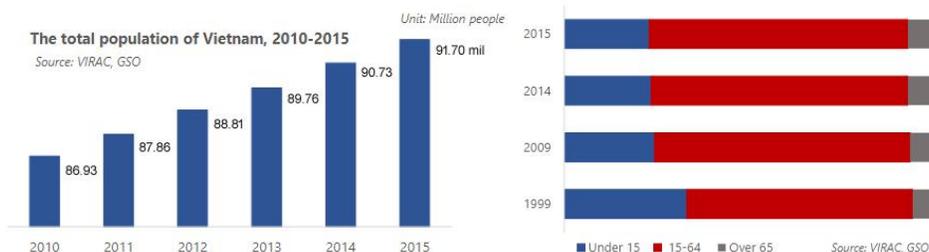
The strong demand for imported drugs is also reinforced by the relatively steady exchange rate of the Vietnamese Dong since 2011 (see Figure 2 above). In fact, with an increasing population that incorporates a relatively stable age structure (see Figure 3a below) and hence a strong and sustainable Vietnamese workforce, the growing trend of the pharmaceutical market in Vietnam is therefore guaranteed. And, with a relatively mild inflation with steady economic growth over the last few years (see Figure 3b), the high demand for imported pharmaceutical products is expected to continue, and hence, the call for the study of the pharmaceutical market of Vietnam and its people's brand awareness, brand loyalty, perceived quality and preferences toward foreign, branded drugs becomes louder and louder. This is especially true when according to the World Bank, even though the health expenditure per capita in Vietnam is much lower when compared to other countries (see Figure 3c), standing at merely USD95 (2012 value), the country exhibits relatively high drug prices as a result of two sad but widely prevalent factors. One of the factors is that under-the-table commissions for doctors to prescribe imported drugs is much higher than that for the relatively cheaper, domestically produced generic drugs<sup>3</sup>. And the other one is that, over the years, the public (or the consumers, to be exact) still tend to believe that imported, branded drugs are better than either the international generics or their locally produced, much cheaper counterparts<sup>4</sup>. The pharmaceutical market in Vietnam,

<sup>3</sup> See news articles by Từ ờng Lâm, 'Ngành dược ì ạch, giá thuốc leo thang (translation: Pharmaceutical industry, drug prices escalate),' Saigon Giai phong Online, March 24, 2011, <http://sggp.org.vn/ytesuckhoe/2011/3/253459/> (accessed on July 1, 2017); and Le Thanh Ha, 'Giá thuốc tăng cao, vì sao nên nổi?' (translation: Drug prices soar, why should it?),' Tuổi trẻ Online, May 27, 2008, <http://tuoitre.vn/Chinh-tri-Xa-hoi/259727/Gia-thuoc-tang-cao-vi-sao-nen-noi.html> (accessed on July 2, 2017).

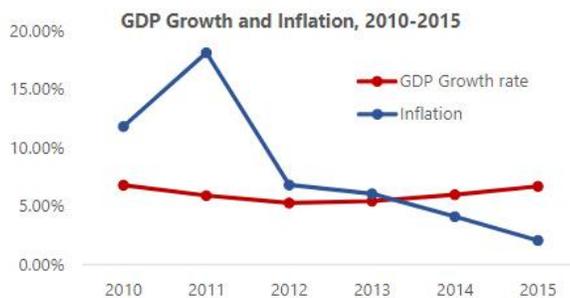
<sup>4</sup> See the news article by Nguyen Huu Duc, 'Cần nghĩ đúng về thuốc nội (translation: Need to think properly about medicine we take),' Tuổi trẻ Online, August 24, 2011, <http://cuoituan.tuoiitre.vn/tin/van-de-su-kien/ban-doc-va-ttct/20110824/can-nghi-dung-ve-thuoc-noi/452298.html>. Last accessed on July 1, 2017.

characterized by a large market but low buying power, can be said to be irregular, if not chaotic, with twisted public affinity on COO and unreasonably high prices for drugs (Nguyen, Knight, Mant, Quang, & Auton, 2009, p.16), making it extremely attractive for foreign pharmaceutical drug manufacturers.

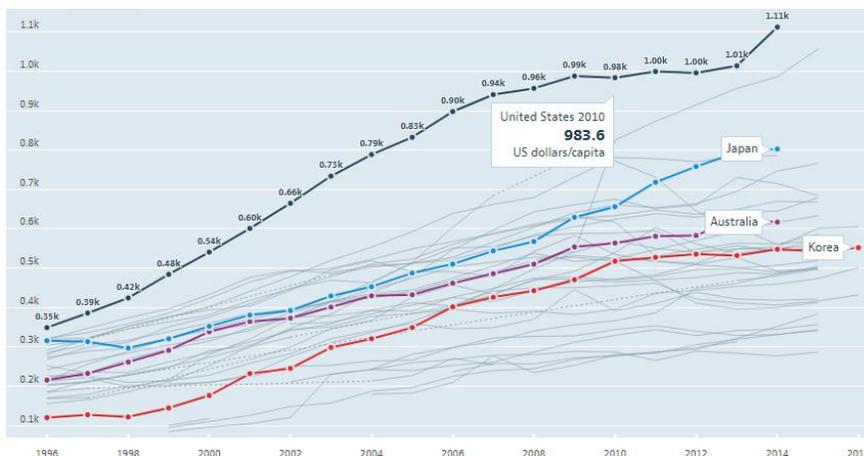
**Figure 3a.** Vietnam population and structure by age group, 2010-2015. Source: VIRAC & GSO.



**Figure 3b.** Vietnam GDP growth vs. inflation, 2010-2015. Source: VIRAC & GSO.



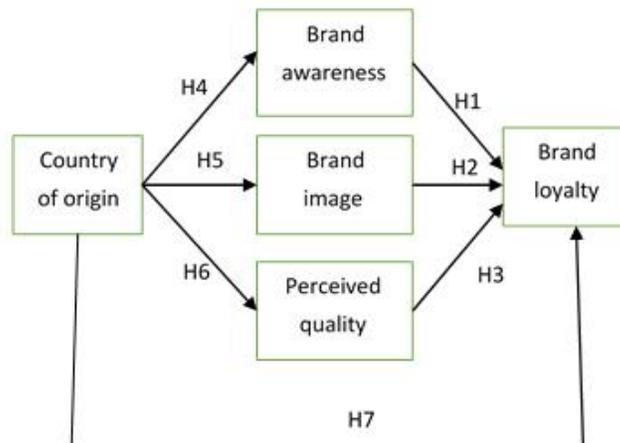
**Figure 3c.** Pharmaceutical spending USD per capita 1996-2016. Source: OECD.



## REVIEW OF LITERATURE

In a previous study in Pakistan, Tajdar, *et al.* (2015) found that the country of origin (COO) of medicines matters most when they are used for anti-asthma, anti-Tuberculosis, anti-biotics, and anti-allergies, but does not matter as much as the brand when it comes to simple medicines like the everyday pain-killer. Such a finding seems to flesh nicely with John Quelch's (1997) iconic experiment in which two groups of people reported totally different, if not extreme, responses after taking the same pain killer (i.e. Aspirin) when one group was given the branded version of Aspirin, *Bayer*, whereas the other group was given the same pill but without the brand name. In fact, with a pharmaceutical market like Vietnam where consumers are seemingly very much COO-biased and tend to believe in imported drugs much more than they do in locally produced generics<sup>5</sup>, it would be logical to assume that the situation found in Pakistan may not replicate itself in Vietnam and that the inconsistency concerning COO among different countries as previously described by Kaynak and Kara (2000) should appear between Pakistan and Vietnam (i.e. people tend to prefer COO to brands across all different types of drugs) when it comes to brand loyalty. Hence, instead of investigating the direct relationship between COO and brand equity, we adapted our research framework (see Figure 4 below) from Yasin, Noor and Mohamad (2007) and Yoo, Donthu, and Lee (2000) and looked at the how COO relates to some selected brand equity dimensions, namely, brand awareness, brand image, perceived quality, and finally, brand loyalty. The respective hypotheses are also labelled according in Figure 4, from H1 to H7.

Figure 4. Theoretical framework.



### Brand Awareness (BA) and Brand Loyalty (BL)

According to Aaker (1996), brand awareness refers to the ability of a consumer to recognize and recall a certain brand under different situations and includes the two concepts of brand recall and brand recognition. Brand loyalty, on the other hand, is often considered to be an attitude or behavior that ends up with repeated purchases as the primary choice (Oliver, 1997) and where such a choice is often category-specific (Schoell & Gultinan, 1990).

<sup>5</sup> See article by Thien Chuong, 'Thuốc nội giá rẻ vẫn bị chê (translation: Cheap drugs are still cheap),' VN Express, May 7, 2011, <http://giadinh.vnexpress.net/tin-tuc/to-am/thuoc-noi-gia-re-van-bi-che-2276035.html>, accessed on June 5, 2017.

While brand awareness is known to constantly and positively relate to brand loyalty in many different fields (Aaker & Keller, 1990), from sports (Wu, 2002) to tourism, and from coffee (Chou, 2005) to rice wine in which brand awareness was found to exhibit strong and direct effect on brand loyalty (Peng, 2006), it is not always true in every country. In a study of female consumers between Thailand and Vietnam concerning an international shampoo brand, correlation between brand awareness and brand loyalty was only found in the Viet market, and not in Thai (Nguyen, Barrett, & Miller, 2011).

### **Brand Image (BI) and Perceived Quality (PQ)**

Brand image is the summation of all brand associations in the memory of the consumer (Keller, 1993), including brand attributes, brand benefits and brand attitude. It helps consumers with gathering information, distinguishing the brand from others, creating a reason to purchase, and provide constructive feelings (Aaker, 1991). In a study concerning private healthcare facility in Malaysia, it was found that the brand image relates strongly with brand loyalty as well as the perceived quality (Piaralal & Tan, 2015). Perceived quality, meanwhile, is the consumers' perception of the overall quality or superiority of the product with respect to its intended purpose, relative to its alternatives (Zeithaml, 1988), and has nothing to do with the actual quality of the product. While it is often believed that perceived quality relates strongly with brand loyalty and will positively influence purchase decisions (Judith & Richard, 2002), a study of cosmetics in Thailand revealed just the opposite – while brand loyalty correlates significantly with brand awareness, brand image as well as perceived quality, it fails to relate to consumers' purchasing decisions (Ponbamrungwong & Chandsawang, 2009). And, in another study in India concerning branded generic drugs (Sanyal & Datta, 2011a), perceived quality has no direct effects but only affects brand equity indirectly through various other mediating variables.

### **Country-of-Origin (COO)**

Traditionally speaking, the country-of-origin is often considered as an extrinsic product cue by many different researchers (Bilkey & Nes, 1982; Cordell, 1992; Erickson, Johansson & Chao, 1984; Han & Terpstra, 1988; Hong & Wyer, 1990; Thorelli, Lim, & Ye, 1989). And while the COO could merely just be a kind of stereotypical response or belief of consumers, the COO does provide general understanding of the quality of products imported from any particular country (Han & Terpstra, 1988) and affects a wide range of dimensions of brand equity (Srikatanyoo & Gnoth, 2002). In a study in India concerning branded generic drugs, Sanyal and Datta (2011b) found that country-of-origin significantly affected two of the brand equity dimensions, namely, brand strength and brand awareness. Similar study in Malaysia suggested that (Said, Hassan, & Musa, 2011) COO affects consumers' product evaluation and hence their subsequent purchase decisions, as well. Yet, Srikatanyoo and Gnoth (2002) also suggested that COO can also be viewed as consumers' beliefs about 'a country's industrialization and national quality standard'. Such an idea gained its ground when Ahmeda and d'Astous (2007) found that Thai consumers, unlike Canadians, consider products made in newly industrializing South Eastern Asian countries to be inferior regardless of product type. Yet when it comes to performance and quality, Canadians become negative toward Thai products<sup>6</sup>.

### **More on the Vietnamese Pharmaceutical Market**

Having reviewed some of the previous studies on branding, one thing for sure is that there should be no absolute relations among or between COO, brand loyalty, brand awareness, brand image and perceived quality, especially when cultural differences is concerned. There is, however, trends that researchers might focus during different eras (Cheng & Wong, 2017) and even types of products as well as their attributes (Cheng & Li, 2016). Having said this, the Vietnamese pharmaceutical market, with a strong socialist historical background, is different, if not unique, from the rest of the other markets across Asia and is often policy-guided. Before 1989, the market was basically centrally

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<sup>6</sup> Despite the fact that country-of-origin could affect perceived product quality, the size of a product matters as well (Cheng & Li, 2016).

planned and controlled by the government<sup>7</sup>. It was only until 1989 (see Vietnam Government Circular No. 440/1989) when drug prices were allowed to be set by market demand for the first time. It was also the first time when subsidies were no longer provided, which means losses in production would no longer be covered using public money. Yet with rising tariffs during 2002 and multiple layers of intermediaries not being effectively monitored, drug prices had soared for almost 10% within the first three months of 2003 when the country's overall inflation rate was well below 2%<sup>8</sup>, right after the government's earlier attempt<sup>9</sup> to allow for more market freedom while stabilizing drug prices in 2002. The price spike later led to further administrative constraint on drug retailing by requiring all pharmaceutical products' prices be declared, clearly printed on packages, and cannot be sold at any prices higher than published prices<sup>10</sup>. The constraints were later expanded to include ceilings on price mark-ups and that retail prices should be comparable to international reference prices, too<sup>11</sup>. However, in a study in 2005, Nguyen (2011) reported that the prices for publicly procured drugs and innovator brands (IBs)<sup>12</sup> in Vietnam were 8.3 times higher than general international prices (though there is no mention of whether this should be set according to the CIF, wholesale, or retail price) for the same formulae (ibid, p.100), and for lowest-priced generics (LBGs) they were 1.82 times higher<sup>13</sup>. Such type of irregularities, suggest that traditional theories on COO versus brand loyalty (and hence purchasing decisions) may not be applicable to Vietnam's unique economy, especially when there is strong and obvious government intervention. Furthermore, other newer research findings may not be applicable to the scenario of Vietnam's pharmaceutical market, too. For instance, in European countries like Norway, profit margins for generic drugs are generally found to be higher than that for branded medicines or other more expensive products (Festøy & Ognøy, 2015). This is due to the fact that degressive margin policy is extensively deployed by the countries in the region (Sood, *et al.*, 2009), i.e. the more expensive the drug is, the lower the mark up. Such a policy, from the practical perspective of Vietnam, may not be immediately feasible as negotiations with the World Trade Organization (WTO) were underway and the Drug Administration of Vietnam (DAV) will have to agree to

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<sup>7</sup> It was the 'Renovation Policy' in 1986 that first transformed the Vietnam economy from central planning economy into a market economy, according to the resolution of the 6th National Party Congress (dated 18 December 1986). Before this time, medicine prices were set by the country's State Pricing Commission (SPC) or the Ministry of Health.

<sup>8</sup> See General Statistics Office of Vietnam, Consumer Price Index (CPI) by month of the year, at [http://www.gso.gov.vn/default\\_en.aspx?tabid=472&idmid=3&ItemID=11811](http://www.gso.gov.vn/default_en.aspx?tabid=472&idmid=3&ItemID=11811). Last accessed on June 15, 2017.

<sup>9</sup> See Ordinance No. 40/2002/PL-UBTVQH10 of April 26, 2002.

<sup>10</sup> See Circular No. 8 (2003).

<sup>11</sup> See Circular No. 120 (2004).

<sup>12</sup> According to Health Online of the Ministry of Health Malaysia: 'An innovator drug is the first drugs created containing its specific active ingredient to receive approval for use. It is usually the product for which efficacy, safety and quality have been fully established. When a new drug is first made, drug patent usually will be acquired by the founding company. Most drug patents are protected up to 20 years. During the patent period, other companies cannot make or sell the same drug until the patent expires. See <http://www.myhealth.gov.my/en/generic-vs-innovator-drugs/>

<sup>13</sup> Based on the calculation that 1USD = 3,218.607 VND (2005 value).

data exclusivity regulations<sup>14</sup>, hence practically extending patent protection for expensive foreign drug brands, and delaying entrance of cheap generics in Vietnam.

## RESEARCH METHODOLOGY

The research was conducted in the form of self-administered questionnaires in the *Hospital District 11 Tan Phu, District 5*. A total of 349 completed questionnaires were received and was analyzed using Cronbach's Alpha. Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were also used to evaluate the pattern matrix and model fit and, finally, Structural equation modeling (SEM) was used to test build a model for our hypotheses, H1 to H7 above. Five constructs, all adapted from previous studies, were used in this paper: country-of-origin (COO), brand awareness (BA), brand image (BI), brand loyalty (BL), and perceived quality (PQ). Question items related to country-of-origin (COO) was measured using five items adapted from Yasin *et al.* (2007) and Kumar and Barker (1987). Brand awareness items were adapted from Aaker (1996). Brand image items were adapted modified from Dobni and Zinkhan (1990). Brand loyalty was taken from Tho, *et al.* (2002). Finally, perceived quality was measured using items adapted from Yoo, Donthu, and Lee (2000).

## FINDINGS

### Profile of Respondents

Among the 349 respondents who completed the questionnaires, 139 (39.8%) were male and 210 were female (60.2%). The age distribution is as follows: 18-25 years (123 respondents, 35.2%), 26-35 years (102 respondents, 29.2%), 30-45 years (40 respondents, 11.5%) and above 45 (80 respondents, 24.1%). In terms of job positions, 7.7% were entrepreneurs, 27.8% were civil servants (officers), 14.6% workers, 23.8% students, and 26.1% housewives. In terms of monthly income, only about half (50.1%) of the respondents were willing to reveal this information. Among these people, 39.8% of the respondents are in the range or 5-10 million VND (approximately 220-440 USD; or the middle class) and 10.3% in from the upper-class, making over 15 million VND (or 660 USD) a month. In terms of education, those who chose to reveal include a stunning 48.7% of bachelor's degree level graduates and 6% from elementary (primary) schools.

### Exploratory Factor Analysis and Reliability Analysis

The sample was adequate and appropriate as indicated by a Kaiser-Meyer-Olkin (KMO) measure of 0.96 and Bartlett's Test of Sphericity being significant ( $p < 0.00$ ). Table 1a below shows the exploratory factor analysis results where 5 factors were extracted without forced extraction using Principal Component Analysis (PCA) with Varimax rotation. All items were sufficiently loaded with factor loadings greater than 0.5 (and none cross loaded), indicating a good pattern matrix. The total variance explained by was 65.6% and an overall Cronbach's alpha of 0.90. Our results show that all scales are reliable in terms of the Cronbach's alpha, with the lowest being perceived quality (PQ) with  $\alpha=0.710$ , while the highest being 'brand loyalty' and 'brand awareness', both with  $\alpha=0.860$ . These values, at this point, indicate a high level of internal consistency within the construct. Table 1a also shows that even though four of the items (shown in red) have corrected-item total correlation of less than 0.3, these items can be safely ignored (and hence deleted) as they do not lower the Cronbach's alpha if deleted. Yet in Table 1b, the calculated average variance extracted (AVE) for 'brand awareness' (BA) and 'perceived quality' (PQ) are both below 0.5, indicating that the data obtained in these two domains would not provide sufficient variance for the

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<sup>14</sup> See James Love, "Vietnam cables: Data exclusivity should be automatic, comprehensive, retroactive and without procedures and formalities," Knowledge Ecology International, September 15, 2011 from <http://keionline.org/node/1265>. Last accessed June 10, 2017.

variables to converge into a single construct. Or, in other words, the questions fail to measure the two latent constructs. In fact, when AVE is below 0.5, average item loadings would be under 0.7<sup>15</sup> (Hair, *et al.*, 2010, pp.776-778), and hence either these questions or the entire domain (or construct) should be removed. And in this case, we choose to modify the model (see Figure 4 above) so as to preserve convergence of the constructs. The new model is shown in Figure 5.

**Table 1a.** Exploratory factor analysis and reliability analysis

Items	Component*					#A	#B	#C
	1	2	3	4	5			
<b>COUNTRY-OF-ORIGIN (COO)</b>								
COO1. I prefer the brand that originates from a country strong in research and development		.72				.18	.91	0.79
COO2. I prefer the brand that originates from a country with a high level of technological advancement		.83				.38	.90	
COO3. I prefer the brand that originates from a country which maintains a high level of quality		.75				.45	.90	
COO4. I prefer the brand that originates from a country which maintains an image of new drug development		.66				.37	.90	
COO5. I prefer the brand that originates from a country which is prestigious in terms of drug manufacturing		.66				.44	.90	
<b>BRAND AWARENESS (BA)</b>								
BA1. I know clearly the brand I bought					.67	.62	.90	0.86
BA2. When talking about the pharma industry, I can remember the brand I bought immediately					.72	.66	.90	
BA3. I can recognize the brand I like among others					.76	.64	.90	
BA4. I can distinguish the brand I like from others					.72	.60	.90	
BA5. I can describe characteristics of the brand I bought when I am asked					.62	.55	.90	
<b>BRAND IMAGE (BI)</b>								
BI1. I feel the brand I like make me feel comfortable			.83			.55	.90	0.77
BI2. I have a clear image about the brand I bought			.85			.59	.90	
BI3. I feel the brand I bought is special			.76			.57	.90	
BI4. I feel the brand is for high-end consumers			.83			.18	.91	
BI5. I feel the brand I bought is expensive			.85			.15	.91	
BI6. I feel the brand I bought familiar to me			.60			.54	.90	
<b>PERCEIVED QUALITY (PQ)</b>								
PQ1. I feel brand I bought has a high quality				.74		.63	.90	0.71
PQ2. I like the quality of the brand I bought				.70		.67	.90	
PQ3. Products of the brand I bought function well				.68		.66	.90	
PQ4. Products of the brand I bought is reliable				.58		.63	.90	
PQ5. The brand I bought is of very good quality				.59		.40	.90	
PQ6. The brand I bought is of poor quality				-.54		-.22	.91	
<b>BRAND LOYALTY (BL)</b>								

<sup>15</sup> It should be noted that even when the factor loadings seem to be good (e.g. around 0.60), the calculated AVE could already be less than 0.50, rendering the model inaccurate and convergent validity is already compromised (Hair, *et al.*, 2010).

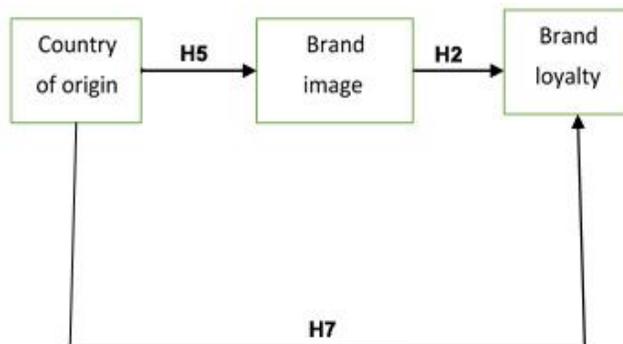
BL1. I use brand I like very often	.78					.56	.90	0.86
BL2. I have an intention to brand I like again	.79					.63	.90	
BL3. I usually use brand I like as preferred choice	.69					.60	.90	
BL4. I will recommend brand I bought to other people when they need	.68					.57	.90	
BL5. I feel close attached brand I bought	.70					.56	.90	

- Exploratory Factor Analysis (EFA) with Varimax rotation, total variance explained = 65.60%, Kaiser-Meyer-Olkin (KMO) measure was 0.96 and Bartlett's Test of Sphericity  $p < 0.00$
- Reliability analysis: Overall Cronbach's alpha was 0.90
- Domains were pre-determined based on proposed structural model.
- #A = Corrected item-total correlation; #B = Cronbach's alpha if item deleted; #C = Cronbach's alpha

**Table 1b.** Construct reliability (CR) and average variance extracted (AVE) values after CFA.

	CR	AVE
<b>COO</b>	0.847	0.529
<b>BA</b>	0.827	0.490
<b>BI</b>	0.909	0.627
<b>PQ</b>	0.682	0.413
<b>BL</b>	0.850	0.532

**Figure 5.** Modified model (new theoretic framework).



Having removed some of the non-converging latent variables, the newly modified model (see Figure 5 above) now explains a slightly larger portion of the total variance (66.55%) and both the construct reliability (CR) and average variance extracted (AVE) values are now well above satisfactory levels (i.e.  $CR > 0.7$  and  $AVE > 0.5$ ), meaning that the respectively grouped items are measuring just one construct and the model will satisfy convergent validity.

**Table 2a.** Exploratory factor analysis and reliability analysis after removing constructs with AVE < 0.5

Items	Component*				#A	#B	#C
	1	2	3	4			
<b>COUNTRY-OF-ORIGIN (COO)</b>							
COO1. I prefer the brand that originates from a country strong in research and development		.71			.22	.84	0.79
COO2. I prefer the brand that originates from a country with a high level of technological advancement		.83			.41	.82	
COO3. I prefer the brand that originates from a country which maintains a high level of quality		.77			.48	.82	
COO4. I prefer the brand that originates from a country which maintains an image of new drug development		.66			.40	.82	
COO5. I prefer the brand that originates from a country which is prestigious in terms of drug manufacturing		.70			.43	.82	
<b>BRAND IMAGE (BI)</b>							
BI1. I feel the brand I like make me feel comfortable			.84		.53	.82	0.86
BI2. I have a clear image about the brand I bought			.87		.59	.81	
BI3. I feel the brand I bought is special			.82		.54	.81	
BI6. I feel the brand I bought familiar to me			.71		.49	.82	
<b>Fourth factor forked under BRAND IMAGE (BI) related to perceived price of a brand</b>							
BI4. I feel the brand is for high-end consumers				.89	.18	.84	0.77
BI5. I feel the brand I bought is expensive				.89	.17	.84	
<b>BRAND LOYALTY (BL)</b>							
BL1. I use brand I like very often	.78				.53	.81	0.86
BL2. I have an intention to brand I like again	.83				.60	.81	
BL3. I usually use brand I like as preferred choice	.76				.56	.81	
BL4. I will recommend brand I bought to other people when they need	.77				.49	.82	
BL5. I feel close attached brand I bought	.76				.51	.82	

- Exploratory Factor Analysis (EFA) with Varimax rotation, total variance explained = 66.55%, Kaiser-Meyer-Olkin (KMO) measure was 0.95 and Bartlett's Test of Sphericity  $p < 0.00$
- Reliability analysis: Overall Cronbach's alpha was 0.83
- Domains were pre-determined based on proposed structural model.
- #A = Corrected item-total correlation; #B = Cronbach's alpha if item deleted; #C = Cronbach's alpha

**Table 2b.** New CR and AVE values after removing constructs with AVE values < 0.5

	CR	AVE
<b>COO</b>	0.830	0.552
<b>BI</b>	0.885	0.660
<b>BL</b>	0.886	0.610

### Confirmatory Factor Analysis and Structural Equation Modelling

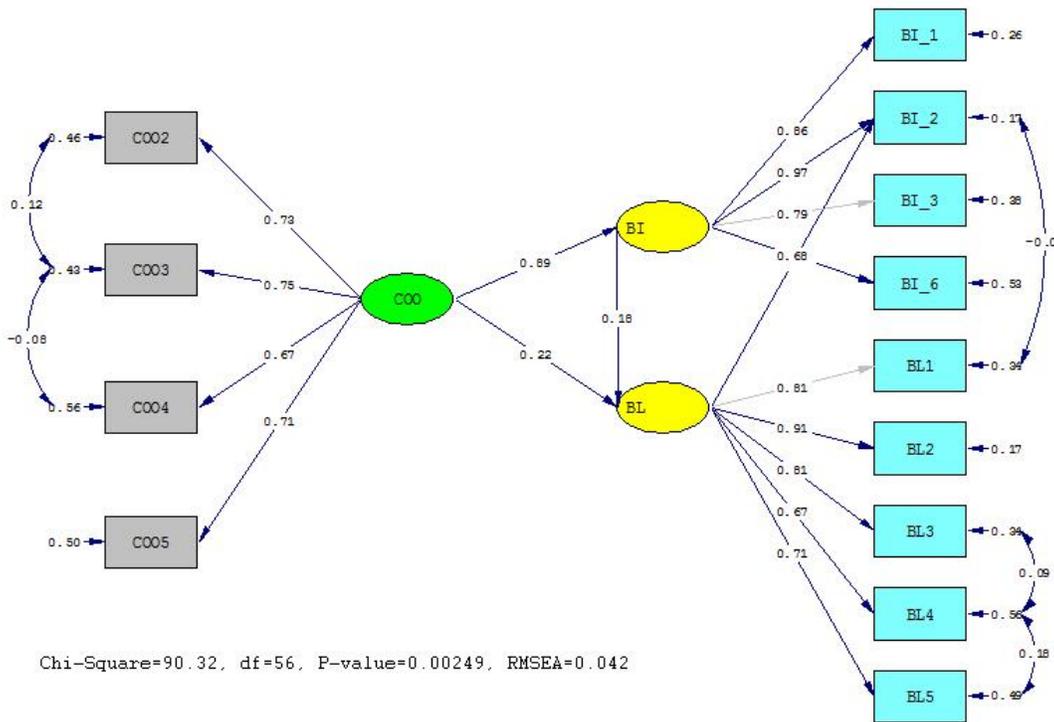
**Initial Model:** The initial three-factor model (i.e. COO, BI, and BL) produced a not-too-bad fit with latent constructs  $\chi^2(\text{d.f.}) = 166.532 (62)$ ,  $p \leq 0.000$ , RMR (root-mean-square residual) at 0.219, GFI (goodness of fit index) at 0.932; AGFI (adjusted goodness of fit index) at 0.901, NFI (normed fit index) at 0.936, RFI (relative fit index) at 0.919, IFI (incremental fit index) at 0.959, CFI (comparative fix index) at 0.958, and RMSEA (root mean square error of approximation) at 0.0695. Yet, modification indices (M.I) still indicated that further changes were required.

**Final Model:** Adjusted according to the M.I. recommendations, an additional link was added between BL and BI2, resulting in a decrease of  $\chi^2$  value of 10.5. The goodness-of-fit statistics of the new three-factor model as well as the associated standardized factor loadings are as follows (see Table 3 and Figure 6 below). Since most of the goodness-of-fit indices (including RMSEA, CFI, GFI, etc.) showed the fitness of the model, we considered it final. Notice that even though the  $\chi^2$  value showed obvious significance, i.e.  $p < 0.00249$ , it is still a widely acknowledged technical fact that  $\chi^2$  is very sensitive to sample size (McCoach, Black, & O'Connell, 2007, p.463) and would tend to become significant whenever the sample size gets above 200 (and our sample size was 349). Therefore, we cannot but have to ignore the  $\chi^2$  value (as well as the  $\chi^2/\text{d.f.}$  value) and rely on other goodness-of-fit statistics in the process of fitting the model. Indeed, in addition to good CFI and GFI values, the RMSEA value was also found to be 0.0428 ( $\leq 0.05$ ). Together with the width of the 90% confidence interval of RMSEA (i.e.  $0.0255 \leq \text{RMSEA} \leq 0.0588$ ), the measures provided enough confidence as to the precision of the final model. We conclude that the new model has high internal validity and accurately measures the three constructs, namely, BL (brand loyalty), BI (brand image), and COO (country-of-origin).

**Table 3.** Goodness-of-fit statistics

INITIAL MODEL		FINAL MODEL	
$\chi^2 =$	166.532, $p \leq 0.000$	$\chi^2 =$	90.32, $p < 0.00249$
<b>d.f.=</b>	62	<b>d.f.=</b>	56
<b>RMR =</b>	0.219	<b>RMR =</b>	0.0384
<b>GFI =</b>	0.932	<b>GFI =</b>	0.965
<b>AGFI =</b>	0.901	<b>AGFI =</b>	0.938
<b>NFI =</b>	0.936	<b>NFI =</b>	0.967
<b>RFI =</b>	0.919	<b>RFI =</b>	0.951
<b>IFI =</b>	0.959	<b>IFI =</b>	0.987
<b>CFI =</b>	0.958	<b>CFI =</b>	0.987
<b>RMSEA =</b>	0.0695	<b>RMSEA =</b>	0.0428

**Figure 6.** Standardized factor loading of the final model.



## CONCLUSION

Our study began with looking specifically at the unique market elements of the Vietnamese pharmaceutical market and how the market is so different from the rest of Asia, if not around the world. People there prefer imported drugs to domestic ones despite high retail prices and they have almost never been benefited from the degressive margin policy, a policy that is quickly becoming the mainstream of global pharmaceutical industry. Also, they do not get to be benefited from cheap generics as a result of expiring patents because of their recent entrance to WTO in 2007 and must still endure expensive medicine costs simply because of under-the-table rebates between doctors and the hospitals. To a certain extent, this study provided an alternative reflection of these issues in Vietnam. The model we have come up with (see Figure 6 above) suggests that brand loyalty (BL) toward pharmaceutical products in Vietnam is not just both directly and indirectly related to the drug's country-of-origin (COO), but the general belief that 'Vietnamese prefer imported drugs to domestic generics' can actually be found in our structural equation models:

<b>BI = 0.890*COO</b> , Errorvar = 4.848, R <sup>2</sup> = 0.141		
Standerr	(0.146)	(0.517)
Z-values	6.101	9.381
P-values	0.000	0.000
<b>BL = 0.188*BI + 0.225*COO</b> , Errorvar = 0.598, R <sup>2</sup> = 0.352		
Standerr	(0.0264)	(0.0580)
		(0.0820)

Z-values	7.097	3.884	7.295
P-values	0.000	0.000	0.000

From the equations above, we can see that COO contributes heavily and directly toward BI (brand image) with a standardized coefficient of 0.89 (which corresponds to our H5, see Figure 5 above) whereas, when it comes to BL (i.e. brand loyalty), COO's both direct and indirect contribution can still be clearly felt (which corresponds to both H2 and H7 in Figure 5 again). Imagine that every single unit of increase of COO would result in  $0.188 \times 0.89 + 0.225 = 0.3923$  unit of increase in BL, which literally translates to some 40% of BL. And for BI, this means a stunning 89%. Yet when this might seem a little odd when everyone in Vietnam favors nothing but only imported, branded drugs, the same phenomenon can be found all over the world. For instance, Japanese women were found to exhibit 'true COO brand loyalty' to imported wines (Bruwer, *et al.*, 2014), Malaysian ladies were found to show COO preferences with cosmetics (Azmi *et al.*, 2016; Azuizkulov, 2013), and Indians, even though being more price-conscious, still would prefer, depending on the product type, imported to domestic goods (Mukherjee, *et al.*, 2012). Yet the only difference between these cases and that of Vietnam is the strong government intervention. And until people in Vietnam gradually realize that their domestically produced drugs are just as good as any famous international brands, our COO-BI-BL model might still stand for a short while.

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Raymond Cheng  
*Reader (Industrial Doctorate Programme), Asia e University,*  
*Kuala Lumpur, Malaysia*  
Email: [raymond.cheng@kellogg.oxon.org](mailto:raymond.cheng@kellogg.oxon.org)

La Thi Hong Loan, MBA MTESOL  
*Lecturer, Van Hien University, Vietnam*  
Email: [lathihongloan@gmail.com](mailto:lathihongloan@gmail.com)

Thai Hoa Nguyen  
*Lecturer, Saigon Technology University, Vietnam*  
Email:

[nthoakhang@yahoo.co](mailto:nthoakhang@yahoo.co)

