Consumer Confidence Index in Vietnam: Scale Development and Compilation Methods

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Abstract

A consumer confidence index (CCI) is an important economic indicator which is used to adjust the forecasting of gross domestic product (GDP) and consumer price index (CPI) in the short-term. Although there exists standard guidelines from the United Nations Statistics Division and European Commission, international experience shows the scale that measures a CCI and the methods of calculating a CCI need to be adapted to the country specific context. Using its own data from the nationally representative survey and factor analysis methods, this paper constructs a scale to measure consumer confidence for Vietnam. The paper, then, computes a CCI and proposes the most appropriate method corresponding to the Vietnamese setting. Validation methods from the paper show that the Vietnamese CCI calculated in the paper reflects approximately the economic picture of the whole country as well as six regions of Vietnam, ensuring the validity of using this index to adjust short-term GDP and CPI forecasts.

1. Introduction

A consumer confidence index (CCI) is a statistical qualitative indicator which measures consumers' confidence in an economy. Katona (1951) argues that a CCI not only measures the expected size of a consumer's future income but also the certainty or uncertainty that is linked to those expectations. The Katona concept implies that a CCI reflects psychological aspects of consumers through their optimism and confidence toward the economy, thus affecting their consumption behavior. Similarly, the European Central Bank (2013) assumes that a CCI plays a critical role in detecting people's opinions on the future of economic development which have not been reflected in aggregated economic indicators such as gross domestic product (GDP).

The information contained in a CCI enables it to be an important economic indicator for forecasting consumer's consumption and to provide information for assessing the current and future health of an economy. This is because final consumption induces a high impact on output and value added of the economy (Ha and Trinh, 2018). Furthermore, a CCI provides early signals of turning points in the economic activity of a country (United Nations Statistics Division, 2014).

Unlike traditional quantitative indicators, the compilation of a CCI is not time-consuming thanks to short qualitative questionnaires and simple calculation methods. The timeliness of calculation and release of a CCI makes it promptly provide information on consumers' expectations and thus their consumption behavior to serve the prediction of an economy's health in the short term. As a result, a CCI can be used to adjust the forecast of other economic indicators, such as GDP and consumer price index (CPI) in the short-term, especially when an economy experiences a period of strong fluctuations in economics and politics.

Because of the above important features of a CCI, approximately 62 countries all over the world have compiled this index. Some international organizations, such as the European Commission and United Nations Statistics Division (UNSD), have introduced handbooks on CCI methodology. Nevertheless, international experience shows that the scale that measures consumer confidence and methods of calculating a CCI need to be adapted to the country specific context (UNSD, 2014) to identify suitable factors constructing the consumer confidence of a country as well as items appropriate for compiling a CCI in that country's setting.

Not being exceptional, the calculation of a CCI for Vietnam is necessary because household consumption accounts for a large share in GDP such as 68.54% of GDP in 2016 and 68.03% of GDP in 2017 (General Statistics Office, 2017). Nevertheless, researches on CCI in Vietnam are scarce. Studies, including those conducted by the National Center for Socio-economic Information and Forecast - Ministry of Planning and Investment (NCEIF), ANZ Bank, and Nielsen, adopted international methods without any validation and adjustment of the measurement of consumer confidence to be suitable with the Vietnamese context. Moreover, these studies are limited to unrepresentative samples. The research conducted by NCEIF only calculated a CCI for Hanoi, not Vietnam. The CCI computed by the ANZ Bank was only for urban areas, but not nationwide.

Nielsen released quarterly CCI's for Vietnam based on a survey questionnaire designed for all 60 countries in the world and with data collected from Internet users. These may lead to an unreliable and invalid CCI. Therefore, this paper attempts to fill in the gap of previous studies and contributes to the literature on the measuring of a consumer confidence index by carrying out a nationally representative household survey, and applying qualitative and factor analysis methods to adjust the measurement of the CCI corresponding to the Vietnamese context. Furthermore, the paper evaluates whether the calculated index reflects accurately the economic picture of the whole country as well as the six regions of Vietnam. Results from the paper reveal the validity of the index.

The remainder of the paper is organized as follows. Section 2 presents the theoretical foundation and literature review. Section 3 describes the methodology used by the research. Empirical results are presented in Section 4. Section 5 concludes.

2. Theoretical foundation and literature review

Consumer confidence or consumer sentiment is a broad concept. Although concepts of consumer confidence vary in different studies, the common concept about consumer confidence drawn from them is that *consumer confidence is a subjective measure of consumers' perceptions of the general economic conditions and their income or financial status and has a close relationship with their own consumption*. In the literature, there are two main approaches related to consumer confidence. The first approach is the classical theory of consumption behavior called the life-cycle permanent income hypoth-esis. Under the permanent income hypothesis (PIH), consumers' expenditures depend on their permanent income and transitory changes in their income make no impact on consumption. Hence, consumer confidence has no role in predicting actual consumption (Friedman, 1957; Hall, 1978).

The second approach is psychological motives reflected by Katona's theory which forms the basis for the compilation of a CCI to measure consumer's willingness to buy. In Katona's view (Katona, 1951; 1960; 1975), consumers' buying behavior is not only completely determined by objective conditions such as income (ability to buy) but also depends on subjective factors such as attitudes and mood (willingness to buy). An individual's consumption depends on their confidence in their future financial condition. If attitudes change, consumption will change, even when consumers' ability to buy is unchanged. Willingness to buy is also affected by unquantifiable or non-economic factors, such as political crises or wars. Accordingly, a decline in confidence can lead to a drop in spending in a way not predicted by economic variables. Thus, consumer confidence enables the prediction of consumption, especially in the periods of strong fluctuations in the economy and politics. Katona's viewpoint is also shared and agreed with by Acemoglu and Scott (1994), Eppright et al. (1998), and Blanchard and Fischer (1989).

Katona's psychological theory of willingness to buy has been used by many countries in the world to construct a consumer confidence index, which is a statistical indicator used to measure consumer confidence. Countries in the world have different definitions of a CCI, but

the common one shared by them is that a *consumer confidence index is an important statistical indicator to measure consumers' perception regarding the overall economy (including employment and inflation), individuals'/households' financial situation, savings or buying intentions (durable goods) at present and in the future*. The information contained in a CCI shows that it is closely related to GDP and CPI, and as such it can be used as a good barometer of consumer confidence to adjust the short-term forecast of these two indicators. It should be noted that each country constructs their CCI from different scales, depending on its specific settings (UNSD, 2014).

Measurement of consumer confidence and compilation of CCI

As consumer confidence is a multi-dimensional concept, any country that wants to measure consumer confidence and compute a CCI needs to develop a scale to measure consumer confidence first. A review of international researches on consumer confidence shows that consumer confidence includes six dimensions. They are: (i) Individual or household financial situation; (ii) Overall economy; (iii) Employment; (iv) Inflation, (v) Savings; and (vi) Purchases (usually durables).

Each dimension is measured by several items. Specifically, items in the "*Individual/household financial situation*" dimension are those reflecting consumers' perception of the change of their own or their household's financial situation or income at present. They also reflect an expected change of an individual or household financial situation or income in the future. The "*Employment*" dimension consists of items related to consumers' assessment of the current national employment situation, and expected evolution of the national employment situation in the future. Items in the "*Overall economy*" dimension should reflect consumers' assessment of the general economic situation at present, and any expected change of the general economic situation in the future. The "*Inflation*" dimension is composed of items related to consumers' perception of evolution of commodity prices or consumer prices at present, and the expected evolution of commodity prices or consumer prices in the future. Items in the "*Savings*" dimension are those reflecting consumer's perception of their own or their household's ability/opportunity/intention to save at present and in the future. The "*Purchase*" dimension includes items related to consumers' assessment of the right moment for major purchases - current and future, and their plan for major purchases.

To collect information from respondents, each item is worded into a Likert scale format question. Usually in consumer confidence surveys, the Likert question is designed in the form of a 5-point scale, ranking from "very positive" to "very negative". As the survey asks respondents to compare their own and the economy's current situations to those in the past, and provide their perceptions on the future, a reference time needs to be introduced for each item. As guided from international standards and experience, the reference times should be the last 12 months and the next 12 months. This is because a 12-month reference period is the most natural benchmark for consumers in order to gauge their present or future situation in an annual (year-on-year) comparison, and help reduce the volatility of the responses (UNSD, 2014).

The overall CCI is computed from two component indexes, including: (i) *Present situation component*; and (ii) *Expectations component*. Items in each component belong to two levels. Micro-level questions consist of those related to individuals/households' actual situation, including individuals/households' financial situation/income in the past, current and future. Consumers are also asked about their saving intention or ability, and spending plans on durables. Macro-level questions are devoted to consumers' perception of the economic situation in the country, the evolution of consumer prices and unemployment currently and in the future.

In the world, there are currently 3 methods of calculating a CCI, including: (i) net balance (weighted and unweighted); (ii) Diffusion index; and (iii) Relative value.

Net balance is the difference between positive and negative answering options for each question, measured as percentage points of the total answers. If a question has three different answer options, "positive", "neutral" and "negative" and if P, E and M (P + E + M = 100) denote the percentages of respondents having been chosen respectively, the option positive, neutral or negative, the net balance is calculated as follows:

$$B_n = P - M \quad (1)$$

In the case of questions with six answer options, the balance is calculated on the basis of weighted or unweighted averages. If P, E and M have the same meaning described above, and PP denotes the percentage of respondents having chosen the option "very positive", MM the percentage of respondents having chosen the option "very negative" and NK is the percentage of respondents without any opinion (PP + P + E + M + MM + NK = 100), the net balance (weighted) can be calculated as:

$$B_n = (PP + 1/2*P) - (1/2*M + MM) \quad (2)$$

while the net balance (unweighted) follows the formula:

$$B_n = (PP + P) - (M + MM) \quad (3)$$

The net balance can vary from -100, when all respondents choose the negative option (or the most negative one in case of six options questions) to +100, when all respondents choose the positive (or the most positive) option. When the net balance is higher than 0, the respondents are optimistic.

Diffusion index is the net balance plus 100. The formula that links the balance to the index is as follows:

$$D_n = B_n + 100 \quad (4)$$

Diffusion index can vary from 0, when all respondents choose the negative option to + 200, when all respondents choose the positive option. When the diffusion index is higher than 100, the respondents are optimistic.

Relative value is the percentage of respondents reporting a "positive" answer divided by the percentage of respondents reporting a "positive" answer adding it to the percentage of respondents reporting "negative". In this case, the index can vary from 0 to +100, the midpoint being 50, meaning that a value of index higher than 50 shows the respondents' optimism. The formula is the following:

$$RV = \frac{\% P}{\% P + \% N} x100 \quad (5)$$

Depending on the country's settings, the CCI is constructed based on from 4 to 10 questions,

using the following formula:

$$CCI = \frac{B_1 + B_2 + \ldots\ldots + B_n}{n} \quad (6)$$

where n is the number of questions used to calculate CCI.

In Vietnam, three organizations have conducted studies on CCI, including the National Center for Socioeconomic Information and Forecast - Ministry of Planning and Investment (NCEIF), ANZ Bank, and Nielsen. NCEIF[1] (2013) compiled a CCI for Hanoi by using a diffusion index and relative value calculation methods, and based on five questions belonging to three factors, i.e. economic situation, employment status, and income. Two questions belonged to a present situation component while the other three questions belonged to an expectations component. The ANZ Bank[2] compiled a CCI for urban areas of Vietnam by using a diffusion index, based on five questions, in which two belonged to a present situation component and the other three belonged to an expectations component. Nielsen[3] calculated a CCI for Vietnam by using a diffusion index, and based on Internet users' perceptions of three questions, in which one question was of a present situation component and the other two were of an expectations component.

While international experience shows that the scale that measures consumer confidence and the method of computing a CCI need to be adapted to the country specific context, none of the above-mentioned researches conducted scale validation to select the best items but just merely adopted international standards in calculating a CCI. In addition, they have not mentioned the best method to calculate a CCI which matches the Vietnamese setting. In this study, we used both qualitative and quantitative methods to identify proper items to measure consumer confidence and an appropriate method in constructing a CCI for Vietnam.

3. Research methodology

To select the best items to construct a CCI, the study firstly conducted in-depth interviews with 10 experts in the consumer confidence area. Next, a group of people who were similar to those to be interviewed in the fieldwork was asked to check the meaning and clarity of the questions. After that, a quantitative method was used to select items for the CCI components through the scale validation method. Finally, the study computed a CCI for Vietnam and proposed an appropriate method corresponding to the Vietnamese setting and validated the reliability of the calculated CCI.

3.1. Scale development

To consult experts, this study used the consumer confidence scale of the European Commission (2017). The scale comprised six dimensions including (i) Income; (ii) Overall economy; (iii) Purchase/Repair; (iv) Consumer prices; (v) Savings; and (vi) Employment and items measuring each dimension. Experts were asked to provide their opinions on the dimensions and items to be included in the scale that measured consumer confidence, and the reference period used for each item.

Findings from the in-depth interviews revealed that consumer confidence in Vietnam should include six dimensions as in the international standards. However, the order of importance of the dimensions was rather different. They were classified in descending order as follows: (1) Individual income; (2) Employment situation; (3) Overall economy; (4) Com-

modity prices; (5) Purchase/Repair/Travel, and (6) Savings. Experts recommended that a CCI for Vietnam should comprise both present situation and expectations components. Moreover, six dimensions, including individual income, employment situation, overall economy, commodity prices, purchase/repair/travel, and savings should be used in both components.

Regarding the reference period used in the items, most experts advised the use of the last 12 month and next 12-month periods as references. Experts also proposed to supplement a number of items with reference periods of the last 3 years and the next 3 years. Therefore, such dimensions as individual income, overall economy and employment situation both had reference periods of the last 12 months and the next 12 months as well as the last 3 years and the next 3 years. The addition of a 3-year reference period aimed at (1) Checking differences in the respondents' answers for the items of similar dimension but different in reference period in order to see the consistency in respondents' replies; and (2) Ensuring adequate items for scale validation.

Findings from the in-depth interview were used to create a questionnaire for a pilot survey with a small sample of 143 consumers in Hanoi, Nam Dinh, Can Tho and Thua Thien Hue. The objectives of this pilot survey were to check the meaning and clarity of the questions. Necessary changes were made to the questionnaire before starting the actual data collection.

3.2. Sample and data collection

To calculate a CCI for Vietnam, the study carried out a nationally representative household survey in November 2017. A 2-stage sampling strategy was applied to select respondents. In the first stage, enumeration areas were selected as follows: 63 provinces/cities were disaggregated by 6 regions of Vietnam. Each region randomly selected 3 provinces (including one largest, one medium and one smallest). The Provinces' size was classified by their GDP per capita. For Central Highlands and the South East, the two regions of the smaller size, 2 provinces (one largest and one smallest) were randomly selected. Hanoi and Ho Chi Minh cities were purposely selected. In each province or city, systematic sampling was used to choose wards/communes. In the second stage, 15 adults aged 16 and above who decided the household's consumption were selected from 15 households in each selected ward/commune.

Overall, the sample survey was conducted in 74 wards/communes of 18 provinces/cities belonging to 6 socio-economic regions in both urban and rural areas of Vietnam. The sample size comprised 1,110 adults aged 16 and above (see Hoang Thi Thanh Ha, 2018 for more information about the sampling strategy). A face-to-face interview method was employed for data collection. The response rate reached 100%. None of the respondents was eliminated. Respondents were equally divided in both urban and rural areas. The sample included slightly more females (50.8%) than males (49.2%), and covered a wide range of consumers aged 16 and above. The respondents possessed different educational levels, occupations, and incomes. The demographic profile of the respondents is presented in Table 1.

After the fieldwork and data collection, the study assessed the internal reliability of the scale by using Cronbach alpha, exploratory factor analysis (EFA) with Maximum likeli-

Table 1: Demographic profile of respondents

	Number (Persons)	Percentage (%)
Total	1110	100.0
Urban- Rural		
Urban	555	50.0
Rural	555	50.0
Gender		
Male	546	49.2
Female	564	50.8
Age group		
16-29	116	10.5
30-39	243	21.9
40-49	249	22.4
50-59	255	23.0
60+	247	22.3
Educational level		
Primary and lower	385	34.7
Lower and Upper Secondary	581	52.3
College and higher	144	13.0
Occupation		
Managers and Professionals	77	6.9
Technicians and associate professionals	39	3.5
Clerical and support workers, services and sales workers	217	19.5
Skilled agricultural, forestry and fishery workers; craft and related trade workers	234	21.1
Plant and machine operators, assemblers and elementary occupations	360	32.4
Unemployed	183	16.5
Monthly income (Million Vietnamese dong-VND)		
< 2	246	22.2
2 to < 5	448	40.4
5 to < 10	342	30.8
10 to < 15	53	4.8
≥ 15	21	1.9

Source: Authors' calculation.

hood using Promax rotation with a criterion of an eigen value greater than 1.0 to test the scale's underlying dimensions, and confirmatory factor analysis (CFA) to assess measurement validity.

4. Empirical results

4.1. Scale validation

All of the items belonging to six dimensions, including individual income, employment situation, overall economy, commodity prices, purchase/repair/travel, and savings identified from the in-depth interview with experts, were used in the scale validation of consumer confidence to identify the most suitable items to construct a CCI for Vietnam. Respondents provided their perceptions on six dimensions through items presented in Table 2. As shown in Table 2, the initial scale that measured consumer confidence in Vietnam comprised six dimensions,

Table 2: Measurement of consumer confidence

| Topic	Code	Perceptions
Individual income	TN1	Change of individual income over the last 3 years
	TN2	Change of individual income over the last 12 months
	TN3	Expected change of individual income over next 3 years
	TN4	Expected change of individual income over next 12 months
Overall economy	KT1	Change of general economic situation over the last 3 years
	KT2	Change of general economic situation over the last 12 months
	KT3	Expected change of general economic situation over next 3 years
	KT4	Expected change of general economic situation over next 12
Employment situation	TV1	Employment situation over the last 3 years
	TV2	Employment situation over the last 12 months
	TV3	Expected employment situation over next 3 years
	TV4	Expected employment situation over next 12 months
Prices	GC1	Evolution of commodity prices over last 12 months
	GC2	Expected evolution of commodity prices over next 12 months
	GC3	Expected gas price over next 12 months
	GC4	Expected electricity price over next 12 months
Savings	TK1	Saving interest rates over next 12 months
	TK2	Opportunity to save at present
	TK3	Ability to save over next 12 months
	TK4	Household saving situation at present
Purchase, repair, travel	MS1	Appropriate moment to make major purchase
	MS2	Plan for major purchase over next 12 months
	MS3	Plan for travelling over next 12 months
	MS4	Plan for purchase or building of house over next 12 months
	MS5	Plan for home improvements or renovations over next 12 months

Source: Authors' suggestion.

with 25 items totally.

To evaluate the reliability and validity of the consumer confidence scale, the study used the Cronbach alpha and EFA. It then applied the CFA to check the consistency of scale measurement from EFA. In order to implement EFA and CFA, items were coded as in Table 2.

Before using EFA, the study applied the Cronbach alpha method for preliminary reliability assessment of items. The results showed that the Cronbach alphas of dimensions (except the dimension "Savings") were good, ranging from 0.68 to 0.93. Specifically, the Cronbach alpha of "Individual income" was 0.86, "Overall economy" was 0.85, "Employment opportunity" was 0.93, "Prices" was 0.72, and Purchase/Repair/Travel was 0.68. In the dimension "Savings", item TK1 "Saving interest rates over next 12 months" and TK2 "Opportunity to save at present" were dropped one by one due to low corrected item-total correlation (< 0.3) and higher Cronbach alpha if item deleted than

Figure 1: Results of CFA for consumer confidence scale
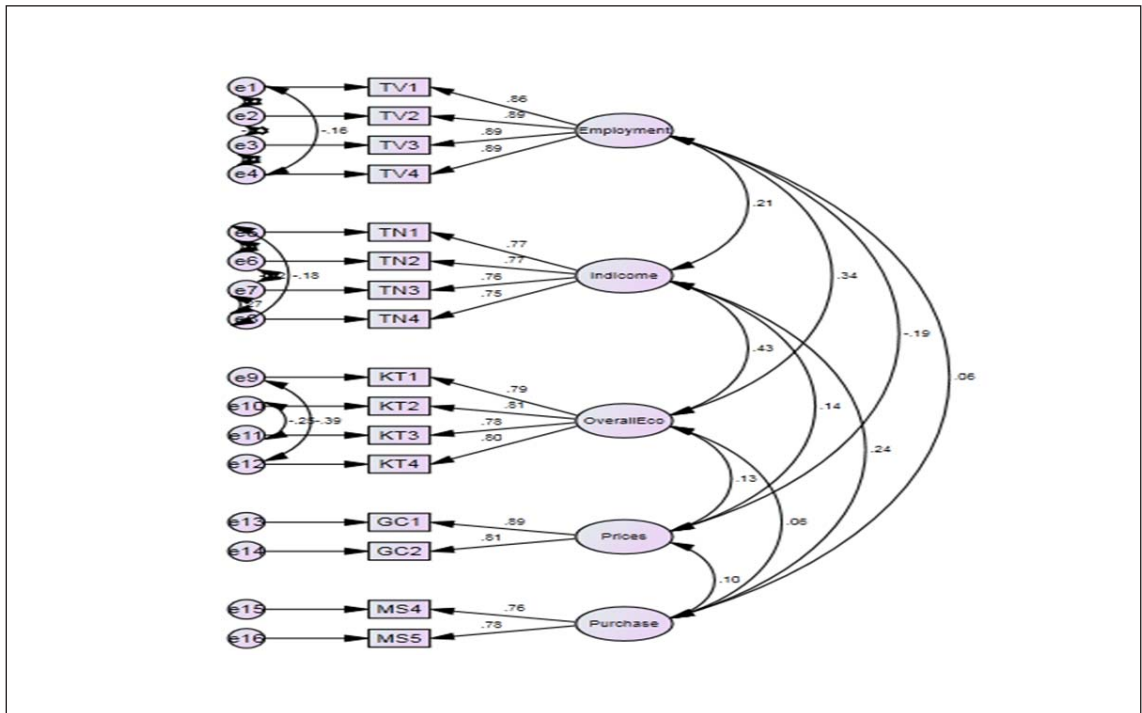
Source: Authors' calculation.

the Cronbach alpha of the dimension. Hence, 23 items of 6 dimensions remained.

To identify appropriate items for the consumer confidence scale in Vietnam, we proceeded with EFA. The appropriateness of factor analysis was examined using two measures: the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The Kaiser-Meyer Olkin measure of sampling adequacy test indicated an acceptable level of 0.76. Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix, which means that all of the variables are uncorrelated. Bartlett's test of sphericity was found to be significant ($p < 0.001$), which meant rejecting this null hypothesis, so the data met this requirement. The eigenvalue reached

1.324, which was greater than 1.

The 23 items that remained after reliability assessment were subjected to EFA. A six-factor solution emerged at first. Items TK3 and TK4 of the dimension "Savings", items GC3 and GC4 of the dimension "Prices", and items MS1, MS2 and MS3 of the dimension "Purchase/Repair/ Travel" were dropped due to low factor loading and/or cross-loading. Therefore, 16 items remained and 5 factors emerged (See Appendix A). The five-factor solution explained 66.57% of the total variance, of which "Employment" items accounted for 24.91%, "Individual income" items accounted for 15.39%, "Overall economy" items accounted for 10.98%, "Prices" items made up 9.03%, and "Purchase/ Repair/ Travel" items accounted for 6.26%. Six-

Table 3: Results of level of fit for measurement model

χ^2	df	χ^2/df	GFI	AGFI	TLI	IFI	CFI	SRMR	RMSEA
398.423	82	4.859	0.956	0.927	0.956	0.970	0.970	0.025	0.059

Source: Authors' calculation.

teen items of the 5 factors had factor loadings greater than the threshold of 0.7 (except TN4 which had a factor loading of 0.638), showing that items were really important in factors and items that had high reliability. In addition, the Cronbach alpha of each factor was satisfactory (> 0.7 and < 0.95), which allowed us to conclude that the scale was appropriate for measuring consumer confidence in Vietnam.

These factors are named as follows: (i) Factor 1: Employment; (ii) Factor 2: Individual income; (iii) Factor 3: Overall economy; (iv) Factor 4: Prices; (v) Factor 5: Purchase.

Sixteen items of 5 factors extracted from EFA were subjected to CFA to check the consistency from EFA. The fit indices in the initial results of CFA were not met. Specifically: Chi-square (94) = 1184.070, p< 0.01, SRMR = 0.035; RMSEA = 0.102, CMIN/DF = 12.596; GFI = 0.880, IFI = 0.896, TLI = 0.867, CFI = 0.895, and AGFI = 0.826. After linking residuals of items in each factor, or linking items of high modification index (MI) together as shown in Figure 1, the results of CFA exhibited an acceptable level of fit for the measurement models as presented in Table 3.

Composite reliability (CR) of all factors was greater than 0.7, indicating that the scale reliability was ensured (Roussel et al., 2002). Average variance extracted (AVE) of all factors was greater than 0.5 and standardized factor loadings of all items were greater than 0.7 and

statistically significant, meaning that the convergent validity of the scale was good (Fornell and Larcker, 1981).

In addition, the results showed that all values of Maximum shared variance (MSV) were smaller than those of AVE, and values of the square root of AVE in the diagonal were greater than the factor's correlation coefficients (See Appendices B and C). Therefore, the divergent validity of the scale was reached. Two factors "Prices" and "Purchase" showed their uni-dimensionality.

The results of scale validation through performing a reliability assessment with Cronbach alpha, EFA, and CFA showed that the scale of consumer confidence in Vietnam consisted of 5 factors, including: Employment, Individual income, Overall economy, Prices, and Purchase. Compared to international standards and the initial 6 factors identified from the in-depth review, the factor "Savings" was inappropriate for the Vietnamese context. Items in the 4 factors "Employment", "Individual income", "Overall economy", and "Prices" were found to be similar to those which were used to compile CCIs in other countries[4]. For the "Purchase" factor, two items including (i) Plan for purchase or building of a house over next 12 months; and (ii) Plan for home improvements or renovations over next 12 months showed their appropriateness to the Vietnamese context. Results from our study showed that the items related

to the purchase of durables were not suitable in Vietnam, in line with findings from Malgarini and Margani (2005)[5] and Curtin (2007)[6].

In comparison with previous studies on CCIs in Vietnam, the results of measurement validity in our study showed that in addition to such factors as individual income, overall economy and employment, one new factor, which was "prices", should be included in the scale that measures consumer confidence in Vietnam. Moreover, two items of the factor "Purchase" were related to house purchase/building/improvements/renovations, which were different from those related to the assessment of the moment to buy durable goods used by other Vietnamese research organizations (such as ANZ and Nielsen).

4.2. Computation and validation of CCI

Scale validation from 4.1 shows that consumer confidence in Vietnam is measured by five dimensions with 16 items. There are many options for combining 16 validated items to calculate a CCI for Vietnam, using one of the three calculation methods described in Section 2. However, the study chose the calculation method which combined 8 items of 4 factors, i.e. Individual income, Overall economy, Employment and prices with reference periods of the last 12 months and the next 12 months for the following reasons. Firstly, all items of these 4 factors showed their appropriateness in the Vietnamese context. Secondly, the literature review indicated that although two items of the factor "Purchase" proved their relevance to the Vietnamese setting, they were not used to calculate CCIs in other countries. This is because these two items were used to monitor the purchase/repair/renovation of houses in other

countries. For a developing nation like Vietnam, care should taken in using these two items in calculating a CCI as houses are valuable assets and thus not everyone can buy, repair, or renovate them. If these two items are used to compute a CCI, the results can be biased[7]. Thirdly, the reference period of the last 12 months and the next 12 months was the most natural benchmark because of their advantages as explained in Section 2 above, and hence should be used in items.

With the above proposed option, 4 items reflecting respondents' assessment of the current situation will be used to calculate a present situation index, and the remaining 4 items displaying respondents' perception on the future belong to an expectations index. The unweighted net balance was used to compile Vietnam's CCI for its predominance over other calculation methods. Firstly, more than half of the countries in the world are using this method. Secondly, this calculation method is, in nature, similar to the diffusion index method which is being used by other countries in Southeast Asia. The use of unweighted net balance helps ensure international comparability of the proposed CCI with Southeast Asian countries. Specifically, the present situation index includes the following items: (i) Change of individual income over the last 12 months; (ii) Change of the general economic situation over the last 12 months; (iii) Employment situation over the last 12 months; and (iv) Evolution of commodity prices over the last 12 months. The expectations index was composed of the following items as: (i) Expected change of individual income over the next 12 months; (ii) Expected change of general economic situation over the next 12 months;

Figure 2: Overall CCI, present situation index and expectations index

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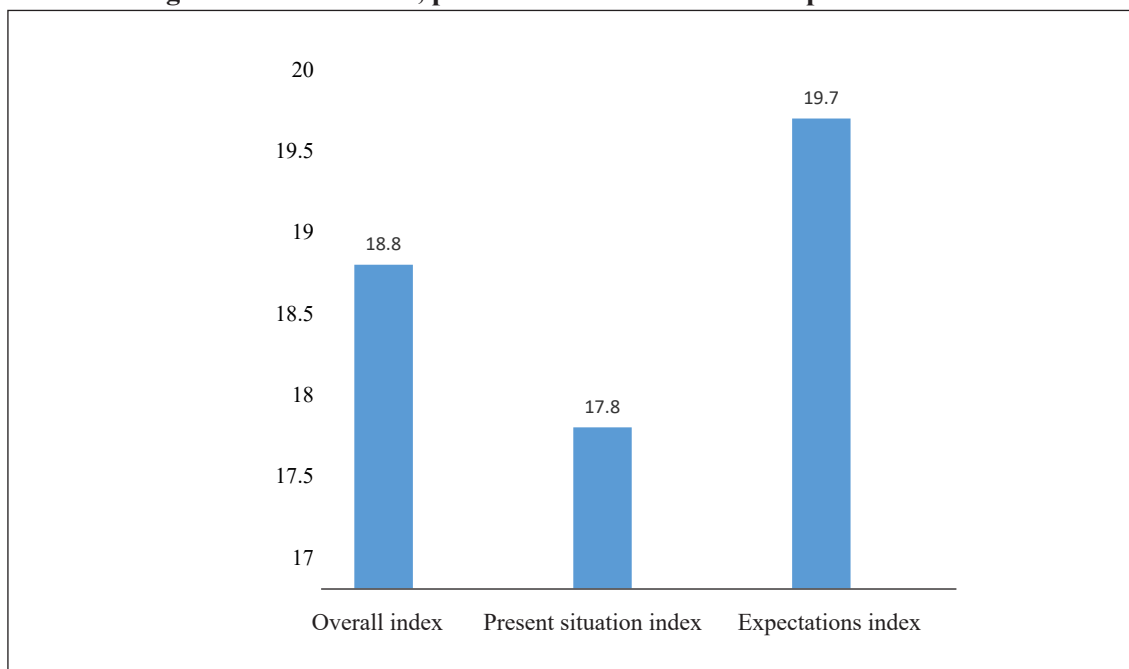
Source: Authors' calculation.

(iii) Expected employment situation over the next 12 months; and (iv) Expected evolution of commodity prices over the next 12 months.

In order to validate the reliability of the calculated CCI, it is necessary to compare this index with the economic picture presented through such socio-economic indicators as GDP growth rate, CPI, and the unemployment rate of working-age laborers. If the CCI reflects correctly the actual national and regional economic status, the calculated CCI is highly reliable.

Figure 2 shows that the overall CCI, present situation index, and expectations index, which were 18.8%; 17.8% and 19.7%, respectively, all reflect consumers' optimism according to the calculation method of unweighted balance[8].

If the present situation index and expectations index compiled from the consumer confidence survey are compared with data on the GDP growth rate, the unemployment rate of the working-age laborers, and the CPI, it can be seen that the indexes of the present situation index's items and expectations index's items reveal the same trend with corresponding socio-economic data. Specifically, Vietnam's GDP growth rate in 2017 was 6.81%, higher than that in 2016 (6.21%). This coincided with the respondents' assessment of Vietnam's better economic performance in 2017 in the present situation index. Data on GDP growth rate of the first quarter of 2018 (at 7.38%) proved that 2018 was the year of the highest first quarter's GDP growth rate in the last 10 years, which helped explain why consumers were so optimistic about the econo-

Table 4: Overall CCI, present situation index, and expectations index by region

(Unit: %)

	Overall CCI	Present situation index	Expectations index
Overall CCI	**18.8**	**17.8**	**19.7**
By region			
Red River Delta	33.8	34.9	32.6
Northern Midlands and Mountains	38.4	42.4	34.4
North Central and South Central Coast	-1.5	-2.0	-1.0
Central Highlands	39.5	39.4	39.7
South East	8.0	3.1	12.9
Mekong River Delta	14.4	10.6	18.2

Source: Authors' calculation from consumer confidence survey.

my over the next 12 months.

In terms of consumers' perceptions of the employment situation and commodity prices, it was clearly shown that their opinions were consistent with data on the unemployment rate of working-age laborers and the CPI. Specifically, both indexes of the employment situation in current and future demonstrated the respondents' optimism for the present and future employment situation (18.7% and 19.8%, respectively). Data on the unemployment rates of working-age laborers released by the General Statistics Office (GSO, 2017) in 2017 was 2.24%, lower than 2.30% in 2016. Also, CPI data showed that the CPI in 2017 was higher than that in 2016 (3.53% versus 2.66%), which was consistent with consumers' assessment of increasing commodity prices.

To evaluate whether the index calculated at a regional level reflects accurately the economic situation of regions, the study firstly calculated the CCI for each region and used the one-way ANOVA test to check whether the indexes were different across regions. The results showed that the CCIs were statistically different at a con-

fidence interval of 95% across the six regions of Vietnam. The study then compared regional CCIs with region-disaggregated GDP growth rate, the unemployment rate of working-age laborers, and the CPI. As presented in Table 4, the two regions with the lowest present situation indexes, i.e. the North Central and Central Coast regions, and the South East region, had the lowest change of the GDP growth rate in 2017 over 2016 compared to other regions (0.44% and 0.57%, respectively). The Central Highlands, the Red River Delta, and the Northern Midlands and Mountains were the three regions with the highest present situation index and they were also the regions with the highest change of GDP growth rate in 2017 over 2016 (1.72%, 1.36%, and 0.9% respectively).

Regarding the unemployment rate, data released by the GSO revealed that in almost all regions, an improvement in 2017 employment was found (except for the South East which witnessed an increase in the unemployment rate of working-age laborers). This explained why respondents felt optimistic about the employment situation compared to the previous 12

months. Moreover, the three regions with the lowest CCI (North Central and Central Coast, South East, and the Mekong River Delta) also had higher unemployment rates of working-age laborers than other regions. This was the reason behind the fact that although consumers in these three regions were optimistic about the employment situation, their level of optimism was lower than that of consumers in others.

Regional CPI data in 2016 and 2017 also indicated that except for the Northern Midlands and Mountains, other regions witnessed an increase of CPI in 2017 as compared to 2016. This was consistent with consumers' assessment of increasing commodity prices over the last 12 months. Additionally, three regions with the lowest CCI were also those which had higher CPIs than others.

Overall, the study's CCI reflected exactly national and regional economic pictures in terms of GDP growth rate, unemployment and CPI. The results of validation proved that the scale that measures consumer confidence and the method which is used to compute CCI are reliable.

5. Conclusion

A consumer confidence index is an important statistical indicator which is used to adjust the forecasting of GDP and CPI in the short-term. Although many countries all over the world compile CCIs, there seems that no agency under the Vietnamese Statistical System calculates and releases this index. The reason is that there has been no study that investigates thoroughly the scale and calculation methods suitable for the case of Vietnam. This paper contributes to the literature by developing a scale that measures consumer confidence and proposes the most appropriate method to calculate a CCI that matches to the Vietnamese setting.

Based on international standards, expert consultations, and its own data from the nationally representative survey and factor analysis methods, this paper finds that the scale that measures consumer confidence in Vietnam comprises five dimensions, including Employment, Individual income, Overall economy, Prices, and Purchase with 16 items.

The study, then, uses the unweighted net balance method to compile a CCI for Vietnam. Validation methods from the paper show that the proposed index reflects approximately the economic picture of the whole country as well as regions of Vietnam, ensuring the validity of using CCI to adjust short-term GDP and CPI forecasts.

APPENDIX

Appendix A: Results of EFA and reliability

Scale items	Factors				
	Employment	Individual income	Overall economy	Prices	Purchase
TV1: Employment situation over the last 3 years	0.863				
TV2: Employment situation over the last 12 months	0.861				
TV3: Expected employment situation over next 3 years	0.918				
TV4: Expected employment situation over next 12 months	0.902				
TN1: Change of individual income over the last 3 years		0.890			
TN2: Change of individual income over the last 12 months		0.827			
TN3: Expected change of individual income over next 3 years		0.722			
TN4: Expected change of individual income over next 12 months		0.638			
KT1: Change of general economic situation over the last 3 years			0.704		
KT2: Change of general economic situation over the last 12 months			0.819		
KT3: Expected change of general economic situation over next 3 years			0.741		
KT4: Expected change of general economic situation over next 12			0.795		
GC1: Evolution of commodity prices over last 12 months				0.956	
GC2: Expected evolution of commodity prices over next 12				0,753	
MS4: Plan for purchase or building of house over next 12 months					0.710
MS5: Plan for home improvements or renovations over next 12 months					0.826
Cronbach alpha	**0.93**	**0.86**	**0.85**	**0.83**	**0.73**

Appendix B: Results of convergent validity

Factor	Item	λ	AVE	MSV	CR
Employment	TV1	0.860	0.778	0.115	0.933
	TV2	0.887			
	TV3	0.893			
	TV4	0.886			
Income	TN1	0.774	0.586	0.187	0.850
	TN2	0.770			
	TN3	0.764			
	TN4	0.754			
Overall economy	KT1	0.785	0.621	0.187	0.868
	KT2	0.814			
	KT3	0.781			
	KT4	0.796			
Prices	GC1	0.891	0.725	0.036	0.840
	GC2	0.810			
Purchase	MS4	0.758	0.588	0.060	0.741
	MS5	0.776			

Appendix C: Results of divergent validity

	Prices	Employment	Income	Overall economy	Purchase
Prices	**0.851**				
Employment	-0.190	**0.882**			
Income	0.145	0.214	**0.766**		
Overall economy	0.132	0.339	0.433	**0.788**	
Purchase	0.100	0.064	0.245	0.062	**0.767**

Notes:

1. NCEIF conducted the research in 2013 to calculate CCI for Hanoi. It has not implemented this survey in reality since then.

2. ANZ Bank released CCI only from July 2014 to December 2015.

3. Nielsen released CCI on a quarterly basis.

4. Not all items in the four factors "Individual income", "Overall economy", "Employment" and "Prices" are employed for the compilation of a CCI. Some countries only select several items in these four factors to compute their CCI.

5. The study by Malgarini and Margani (2005) finds that when disaggregating consumption by durables, the role of confidence is stronger in explaining services expenditures. The significance of a CCI is

very weak in the case of durables. An explanation of this finding is that services expenditures, such as expenditures for travel and leisure and for ICT-related services may have gradually acquired the role that was previously that of durable goods.

6. Curtin (2007) stated that consumers spent more on services than durables.

7. The results of calculating a CCI by using these two items provided a much lower CCI than others. For a reference period of 12 months, these items are not suitable. For further information related to this, please refer to the author's forthcoming dissertation.

8. According to this calculation method, a CCI higher than 0 exhibits the respondents' optimism.

Reference

Acemoglu, D. and Scott, A. (1994), 'Consumer confidence and rational expectations: Are agents beliefs consistent with the theory?', *The Economic Journal*, 104, 1-19.

Blanchard, O.J. and Fischer, S. (1989), *Lectures in macroeconomics*, The MIT Press, Cambridge.

Curtin, R. (2007), 'Consumer sentiment surveys: Worldwide review and assessment', *Journal of Business Cycle Measurement and Analysis*, 1, 7-42.

Eppright, D.R., Arguea, N.M. and Huth, W.L. (1998), 'Aggregate consumer expectation indexes as indicators of future consumer expenditures', *Journal of Economic Psychology*, 19, 215-235.

European Central Bank (2013), 'Confidence indicators and economic developments', in *Monthly Bulletin January 2013*, European Central Bank, Germany, 45-58.

European Commission (2017), *The joint harmonised EU programme of business and consumer surveys User Guide*, EU Commission, Brussels.

Fornell, C. and Larcker, D.F. (1981), 'Evaluating structural equation models with unobserved variables and measurement error', *Journal of Marketing Research,* 28, 39-50.

Friedman, M. (1957), *A Theory of the Consumption Function*, Princeton, NJ: Princeton University Press.

General Statistics Office (2017), *Statistical yearbook*, Statistical Publishing House, Vietnam.

Ha, N.H.P. and Trinh, B. (2018), 'Vietnam economic structure change based on Vietnam input-output tables 2012 and 2016', *Theoretical Economics Letters*, *Scientific Research Publishing*, 8, 699-708*.*

Hall, R.E. (1978), 'Stochastic implications of the life cycle-permanent income hypothesis: Theory and evidence', *Journal of Political Economy*, 86(6), 971-987.

Hoang, T.T.H (2018), 'Study on consumer confidence survey and the application to Vietnam', Ministry level project, Institute of Statistical Science, Hanoi.

Katona, G. (1951), *Psychological analysis of economic behavior*, New York: McGraw-Hill.

Katona, G. (1960), *The powerful consumer*, McGraw-Hill, New York.

Katona, G. (1975), *Psychological economics*, Elsevier Scientific Publishing Company, New York.

Malgarini, M. and Margani, P. (2005), 'Psychology, consumer sentiment and household expenditures: A disaggregated analysis', *Istituto Di Studi E Analisi Economica*, 58.

NCEIF (2013), *Investigation of consumer confidence in Vietnam*, Hanoi.

Roussel, P., Durrieu, F., Campoy, E. and Akremi, A. (2002), *Méthodes D'*équations Structurelles: Recherche Et Applications En Gestion, 1st edition, Economica, Paris.

United Nations Statistics Division (2014), *Handbook on economic tendency surveys*, retrieved on October 20th 2014, from <http://unstats.un.org/unsd/nationalaccount/consultationDocs/draftETS-Handbook-May2014.pdf>.