1. Introduction

Leading indicators are important for evaluating market activity and for identifying economic trends. Consumer Sentiment Index (CSI) and Government Confidence Index (GCI) are considered as good leading indicators because they are likely to influence household consumption or saving (see, e.g., Carroll et al. 1994 and Ludvigson 2004), electoral outcomes (Hardouvelis et al. 2007), and therefore, ultimately, the business cycle. However, CSI and GCI are not to be considered independently (each one is likely to influence each other) as households are simultaneously both voters and consumers (Tullock 1976). Furthermore, the interrelationship between these two leading indicators could also be modified by shocks that affect the state of the economy.

This phenomenon raises an important question resulting from the concept of priming in political science: is there some asymmetry in the effects of shocks, depending on the state of the economy (good or bad)? Hetherington et al. (2008) argued that priming is a key factor and that political trust is influenced by the state of the economy. Political scientists define priming as "*changes in the standards that people use to make political evaluations*" (Iyengar and Kinder 1987, p.63). When economic issues loom larger for the public, typically during crises, governments are likely to be blamed. By contrast, fewer people will perceive the economy as a pressing concern during periods of expansion, which suggests that the economy will have less impact on government confidence[1]. Consequently, GCI could respond sharply to CSI during economic recessions, but to a less extent during economic expansion. In other words the Consumer Sentiment Index could have an asymmetric effect on Government Confidence. The reverse cannot be excluded either[2].

The objective of this research note is precisely to test for the existence of asymmetry for France for the period covering the last twenty five years with respect to the state of the economy. The outline of the note is the following. The nature of the relationship between GCI and CSI is presented. The presentation of the data we use follows, as well as the econometric strategy and results. A discussion on the effect of changes in consumption on the nature of the dynamics of the confidence indicators concludes the text.

2. The relationship between CSI and GCI

In most of the political science literature, consumer sentiment is considered as an independent variable and its predictive power for economic or political outcomes is investigated. The usual assumption is therefore that Consumer sentiment forms first and that Government confidence results from it. In this literature the incumbent's image depends mainly on whether the economic situation is improving or deteriorating. The expression "The economy, stupid" (used by James Carville, during Clinton's campaign in 1992) is an

[1] Trust and government confidence are distinct concepts but the intuition suggests that they are related concepts and that priming could also play a role in the formation of government confidence.

[2] In economics, we also have examples of asymmetry and the importance of framing in consumers' reactions to gains or losses (see for example Kahneman and Tversky 1979). As far as we know, we do not have evidences that in recession, consumers pay more attention to signals of government competence and that it is likely to influence their consumer sentiment more sharply than during expansion period but it cannot be excluded. CSI could respond asymmetrically to GCI.

illustration of that assumption in popular belief. During an economic recession, people are more focused on the economy and pay more attention to policies directed to fight unemployment. They tend to blame the government for bad economic results (and praise them for good ones). The relationship is therefore going from the economy (or the perception of the state of the economy: CSI) to GCI.

A notable exception in the political science literature is the work of De Boef et al. (2004) who have shown empirically that "political evaluations of the president's management of the economy along with budgetary policy and key political events, influence economic sentiment." The assumption is that government competence is so crucial to the economy and to household personal finances than perception of government forms first and consumer perception of the economy then develops from it. Indeed the government has the ability to change macroeconomic conditions and household personal finances through taxes, labor market regulations or investments (or disinvestments) in public goods for example. In that case GCI could form first and directly influence CSI.

Both scenarios seem plausible. Depending on the main variable of interest, analysts are more likely to assume one as independent and to forecast the other one. Specifically, macroeconomists generally assume that GCI is an independent variable that forms independently (maybe depending on the traits of the politicians or on political scandals for example) and that can be used to forecast the economic variables of interest CSI and in turn consumption.

Finally, it is also possible that the two indexes influence each other and that the causality goes in the two directions; using time series, the two may then be estimated simultaneously. An analysis of the statistical properties of the series can help to shed some light on the causal relationships between these variables. More interestingly, the use of time series help to test whether the state of the economy affects the dynamics of the system or not. The strength and direction of the relationship could change with the state of the economy (good or bad). Time series analysis can help to investigate whether there are some threshold effects: it is the object of the next section.

3. Data

3.1. Sample

We use monthly indicators for the confidence indexes: the consumer sentiment indicator and perceived confidence index of the president and the prime minister. In the French context, the president and the prime minister are the two prominent members of the government and are traditionally in charge of different areas (respectively defense and foreign affairs for the president and domestic issues for the prime minister).

Consumer Sentiment Indicator (CSI) is drawn from the "Joint Harmonised EU Programme of Business and Consumer Surveys" where approximately 3,300 consumers are surveyed in France. Respondents share their expectations about their personal finances and the general economic situation over the next twelve months. The questions of the survey are presented in the Appendix.

There are two Government Confidence Index, respectively for the elected president and the prime minister (appointed by the president), who are the two head of the government. These GCI are drawn from the monthly indicator "*Baromètre Figaro Magazine–TNS Sofres/Logica*"; it surveys 1,000 persons and asks them respectively: "Are you confident that the president (prime minister) is able to handle current problems in France"?

3.2. Variables and model

Descriptive statistics of the variables CSI (Consumer Sentiment Index), PMCI (Prime Minister Confidence Index) and PCI (President Confidence Index) are shown in Table 1. Unit-root tests are presented. The presence of a unit root is rejected at a significance level of 10% for all tests for the three series CSI_t, $PMCI_t$ and PCI_t. Other tests confirming these results have been performed but are not presented here. The series are therefore stationary, excluding the scenario of a cointegration relationship. The three series do not co-move (for example, PCI is not proportional to CSI or vice versa[3]).

A vector autoregression model (VAR) is the traditional model used to analyze the dynamics of the series but it assumes no asymmetry. In a VAR, each variable is expressed as a linear function of its own past values, the past values of the other variables under consideration, and a serially uncorrelated error term. No assumptions (other than this choice of variables) are necessary, the number of lags being determined statistically.

In order to test for a possible asymmetry, we rely on a threshold vector autoregression (TVAR), with both a "bad" and a "good" time regime, measured respectively by a decrease and an increase in consumption levels. It is an extension of the VAR model that allows possible asymmetry (but does not impose any). Consumption level is chosen as the indicator of the state of the economy. A good state of the economy can be interpreted as a period with higher income (and possibly expectations of higher future income). It should increase consumption level today if the proportion to consume is rather stable over time. A good state of the economy can also be associated with less uncertainty about the future. It should diminish the precautionary motive for saving and should result in higher consumption today relatively to tomorrow.

4. Econometric methodology and results

The chosen specification allows the regime to be endogenously determined. Within each regime, the time series can be modeled linearly as follows:

$$Y_t = \psi_0^1 + \psi_1^1(L)Y_{t-1} + (\psi_0^2 + \psi_1^2(L)Y_{t-1})I\left[q_{l,t-d} > \gamma\right] + \varepsilon_t \quad (1)$$

Where Y_t is a vector comprising president confidence, prime minister confidence, Consumer Sentiment Index and consumption level. $\psi_1^1(L)$ and $\psi_1^2(L)$ are lag polynomial matrices, ε_t is the error term vector, $q_{l,t-d}$ is the threshold variable. $I\left[q_{l,t-d} > \gamma\right]$ is an indicator function that equals 1 when the system switches to a good time regime and zero otherwise. The integers d and l are delay lag estimated with the other parameters of equation 1. The threshold function is proportional to the sum of the past values of consumption changes denoted *dc*:

$$q_{l,t-d} = \frac{1}{(l-d+1)}\sum_{j=d}^{l} dc_{t-j} \quad (2)$$

In practical terms, the specification of Equation (1) requires several choices: (a) the list of variables to be included in *Y* (and whether in levels or first differences); (b) the functional form for the threshold variable; (c) the recursive ordering; (d) the lag length of the VAR (e) and (f) the delay *(d,l)* of the threshold variable.

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[3] For example, it is known than consumption and income tend to be cointegrated. Over the long run, consumption tends to be a roughly constant proportion of income. We do not have such a thing here between GCI and CSI or vice versa. Therefore both GCI and CSI offer unique information for forecasting.

With respect to the state of the system and the economy, we assume that consumers will perceive the situation as good when they are able to increase their consumption and as bad when they need to reduce it[4]. The threshold will be determined endogenously and is not necessarily zero (even if it is logically expected to be zero). The TVAR describes the evolution of the time series Y and the regime of the economy for the consumer (good or bad). This implies that shocks to political confidence, consumer sentiment or variation in consumption can determine whether the economy is in a favorable or unfavorable consumption regime.

To avoid a high frequency of regime switching, we model the threshold function as a moving average of past values of the economic situation (measured by consumption level in first difference). For the impulse response functions, we need to make an assumption regarding the VAR ordering. We consider the following order: PMCI→ PCI → CSI→ d(consumption)[5]. We have tried different ordering and it does not change the general conclusion on symmetry.

For the lag length of the linear VAR, Likelihood-ratio (LR), final prediction error (FPE), Akaike's information criterion (AIC), final prediction error (FPE) and Akaike's information criterion (AIC) tests conclude to two optimal lags. Schwarz's Bayesian information criterion (SBIC) test concludes to one optimal lag. Following Atanasova (2003) and choosing the same lag for the nonlinear VAR than the linear VAR, (d,l) are chosen to maximize the log likelihood. We tried with a VAR(1) and a VAR(2). The threshold function is found to be a moving average function of the change in consumption with 5 lags (d=1,l=5). The threshold value is found to be zero[6].

Following Hansen (1996), we test the null hypothesis H_0: $\psi_0^2 = \psi_1^2 = 0$ that the coefficients are the same in both regimes (in such a case a VAR model is appropriate), against the alternative hypothesis of a two-regime model (a TVAR model is appropriate). The P-value is 0.516: we cannot reject the null hypothesis that the appropriate model is a linear VAR model. When checking for robustness with a VAR(2), the coefficients of (d,l) that maximize the log likelihood are (d=1,l=5). The threshold value is then found to be zero and the P-value is 0.682. The conclusion does not change with a different specification. We cannot reject the null hypothesis that the appropriate model is a linear VAR model.

We also try to select the lag order of the VAR model, simultaneously with (d,l) by trying the different combinations of a VAR(1), VAR(2), VAR(3) with d=1 or 2 and l=1,2,

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[4] Consumption has also been chosen over GDP, a more traditional measure of the state of the economy, for the quality of the estimation. Consumption is released on a monthly basis while the GDP is only released on a quarterly basis. The two series are known to be cointegrated in the long-run. The correlation of the two series is equal to 0.99 for our sample. Some robustness check will be performed to confirm that the results also hold with GDP.

[5] It imposes the following restrictions: structural shocks to $PMCI_t$ have a contemporaneous effect on PCI_t and CSI_t and d(consumption). But structural shocks to PCI_t and CSI_t do not have any contemporaneous effect on $PMCI_t$ ($PMCI_t$ reacts with lag to shocks to other variables of the system).

[6] Robustness checks have been performed. The economic growth rate has been used instead of the change in consumption to model the economic regime. The same series test and estimation of threshold models have been conducted for different specifications. Using quarterly data for the period 1987:4- 2014:2 (107 observations) the threshold function is found to be a moving average function of the changes in real GDP with 1 lag (d=1,l=1). The threshold value is found to be 0.6. In other words, the economy is endogenously estimated by the model to be in a good state for an economic growth equal or greater to 0.6%. The P-value of the test with a linear VAR model for the null hypothesis and a threshold VAR under the alternative hypothesis is equal to 0.304. We fail to reject the linear VAR. Therefore the same conclusion holds when changes in consumption or economic growth are used as an indicator of the state of the economy.

…or 6, following Calza et al. (2005). We find that the optimal combination is a VAR(1) with (d=1, l=5), one of the two specifications already described above. Therefore, in this application, a threshold model is not necessary to describe the dynamics of consumer confidence and political confidence. The response of consumer sentiment does not appear to depend asymmetrically on a shock to political confidence. The conclusion is the same when the ordering of GCI and CSI are modified (in that case GCI does not respond asymmetrically on a shock to CSI).

5. Concluding remarks

Both political confidence and consumer sentiment are variables of interest to forecasters and policy-makers. They each contain unique set of information about the households' confidence and are important to forecast consumption or the success of economic policies for example (as shown by the fact that they are not cointegrated). But they cannot be used independently because as previously stated households are at the same time consumers and voters. Their perception of the government ability to handle the economy is likely to influence their confidence in the economy, and vice versa. Further and it is the object of this research note, the state of the economy could frame their perception and could affect the dynamics of confidence indicators. Forecasters and policy analysts should then be aware that the economy could enter into a state (for example in bad times) where the dynamics could be different than the one in another state (for example in good times). It would complicate even more predictions and analyses.

Using the Joint Harmonized EU Programme of Consumer Survey as well as French monthly economic and political time series (from May 1988 to April 2010), a TVAR model was used to test this assumption. The results fail to show the existence of asymmetry and the existence of states of the economy that could change the dynamics of confidence indicators. It therefore simplifies the methodology for causal relationships and predictions. A simple VAR model can do the job. Whether there exist other sources of asymmetry remains on open question and is left for future research. For example, the weight people assign to international issues (weight that is likely to alter the signal households can infer from the state of the economy on their government ability) could also potentially introduce asymmetry in the system.

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Appendix

THE JOINT HARMONISED EU CONSUMER SURVEY/Questionnaires (monthly questions)

Consumer survey

The index of consumer sentiment is calculated as a weighted average of four prospective questions with the following formula:

Confidence Indicator (Q1 + Q2 – Q3 + Q4) / 4

Q1 How do you expect the financial position of your household to change over the next 12 months: It will get a lot better? get a little better? stay the same? get a little worse? get a lot worse? don't know.
Q2 How do you expect the general economic situation in this country to develop over the next 12 months? It will get a lot better? get a little better? stay the same? get a little worse? get a lot worse? don't know.
Q3 How do you expect the number of people unemployed in this country to change over the next 12 months? The number will increase sharply? increase slightly? remain the same? fall slightly? fall sharply? don't know.
Q4 Over the next 12 months, how likely is it that you save any money? very likely? fairly likely? not likely? not at all likely? don't know.

Tables

Table 1. VAR Descriptive statistics for (CSI, PMCI, PCI)

A. Stationarity Tests of the series

			DF-GLS				Philips-Perron	
	Mean	SD	Lag=1	Lag=2	Lag=3	Lag=4	Z(rh)	Z(t)
CSI	-17.49	8.79	**-2.68***	-2.69*	-2.79*	-2.67*	-17.16***	-2.97**
PMCI	48.10	13.39	**-3.69*****	-3.55***	-3.41**	-3.42**	-22.92***	-3.44**
PCI	43.95	11.17	-3.56***	-3.32**	-3.42**	**-3.00****	-20.85***	-3.27

***: Denotes rejection of a unit root at the 1% level, ** at the 5% level and * at the 10% level.
In bold, we denote the test statistic for the optimal lag chosen by the modified AIC method, for the modified Dickey-Fuller Generalized Least Squares approach of Elliott,Rothenberg and Stock (1996)