REGIONAL SECTORAL

Consumer employment expectations for the country: drivers and impact of the labor and fiscal reforms

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- **Consumer employment expectations for the country have posted negative annual growth rates since February 2013.**

- **Undoubtedly, the country's economic deceleration in 2013 and the start of the economic uptick at the beginning of 2014 have affected the behavior of these expectations.**

- **Respondents from the Touristic, Medium Development, Industrial and High Marginalization regions tend to be more optimistic than those from the High Development region.**

- **Optimism about employment expectations for the country shows little variation across different educational levels.**

- **The labor reform has made a positive contribution to the employment expectations for the country, while the fiscal reform has had the opposite effect.**

Description of data and methodology

Information about consumer employment expectations was obtained from the qualitative responses to question 13 in the core questionnaire of the National Consumer Confidence Survey (ENCO, by its acronym in Spanish). Such question is formulated as follows:

Do you believe that EMPLOYMENT IN THE COUNTRY OVER THE NEXT 12 MONTHS

1. will increase a lot?

4. will fall slightly?

2. will increase a little?

5. will fall a lot?

3. will stay the same?

6. don't know

In order to have an aggregate measure of the consumer employment expectations for the country, a monthly diffusion index was built.[1] To that end, data from January 2003 to May 2014 were used.

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[1] The diffusion index was calculated as follows: (1) The "don't know" answer was prorated among the other reply options to question 13; (2) the proportions of each reply option to total replies were calculated with the expansion factors for households taken into account; (3) the weights 1.0, 0.75, 0.5, 0.25 and 0.0 were used for the options "will increase a lot", "will increase a little", "will stay the same", "will fall slightly" and "will fall a lot", respectively; (4) each proportion was multiplied by its corresponding weight; and (5) the products of the previous step were added together. It is worth mentioning that the numerical values for the weights were set in that way so that 0.5 reflects neutral aggregate expectations for employment. That is, 0.5 represents the expectation for the same level of employment in the country over the following 12 months.

Figure 1
Consumer employment expectations (diffusion index Jan 2003 = 100)
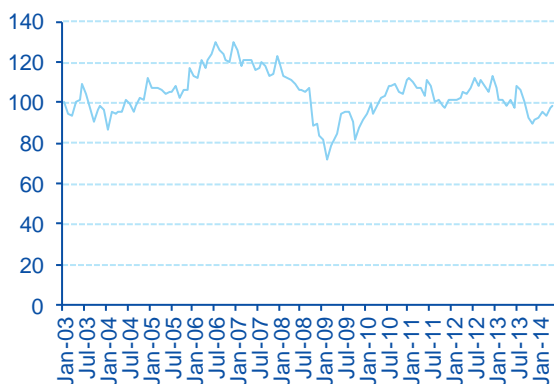
Source: BBVA Research with data from INEGI

Figure 2
Consumer employment expectations (diffusion index, var. % YoY)
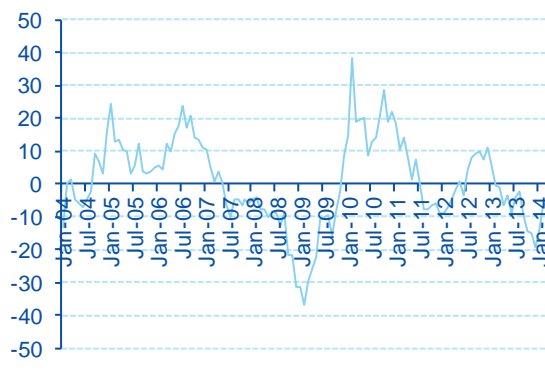
Source: BBVA Research with data from INEGI

Figure 1 shows that since October 2013 employment expectations have been below the level registered in January 2003. In contrast, expectations were above such level for virtually every month during the initial years of the economic recovery after the global financial crisis of 2008-2009. Moreover, Figure 2 illustrates how consumer employment expectations have shown negative annual growth rates since February 2013. Undoubtedly, the country's economic slowdown in 2013 and the incipient economic uptick at the beginning of 2014 have influenced this qualitative indicator's behavior referring to the expected employment level for the country in the next 12 months.

In order to be able to identify how certain factors may be shaping the behavior of consumer employment expectations for the country, the multinomial logit model was used. [2] In general, this methodology allows us to analyze qualitative replies or dependent categorical variables. In the analysis done in this document, the dependent variable was built so as to indicate whether the respondent expects that employment in the country "will increase", "will stay the same" or "will fall" in the next 12 months. That is, the "will increase" expectation occurs when the respondent answers (question 13 of the core ENCO questionnaire) "will increase a lot" or "will increase a little", whereas the expectation corresponding to "will fall" is obtained when the respondent replies "will fall a little" or "will fall a lot".

Concerning the explanatory factors that were explored, some of the respondents' socio-demographic characteristics were considered, such as the region of the country they live in, their gender and level of education. [3] Moreover, macroeconomic variables were taken into account for the purpose of controlling for the country's macroeconomic environment. [4] Finally, a pair of dummy variables was added to all the explanatory

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[2] The mathematical notation of the multinomial logit model is given in Appendix A of this document.
[3] The socio-demographic information was obtained from the micro data in the ENCO's socio-economic questionnaire.
[4] The macroeconomic variables used were the national unemployment rate, seasonally adjusted, and the Global Economic Activity Index (IGAE, by its acronym in Spanish) annual percentage variation, seasonally adjusted.

factors above, with the objective of representing the activation of the labor and fiscal reforms as of their respective approvals by the Mexican Congress.

Given the set of explanatory factors listed above, it was possible to estimate the probabilities of each one of the three possible replies to the question about the country's employment expectations: "will increase", "will stay the same" and "will fall". With the aim of comparing the econometric model based on those explanatory factors, two other econometric specifications were estimated: 1) the model using solely socio-demographic characteristics; and 2) the model using socio-demographic factors and dummy variables to control for the possible monthly seasonal variations in the respondents' replies. The econometric estimates were based on a sample of 73,590 questionnaires collected between January 2011 and January 2014.[5]

Analysis of results

A more technical discussion of the econometric results is given in Appendix B. In the case of the model with added macroeconomic variables (the benchmark model), the most important findings are: i) respondents from the Touristic, Medium Development, Industrial and High Marginalization regions tend to be more optimistic than those from the High Development region;[6] ii) respondents with a high school diploma or less educated tend to be less optimistic than those with higher than high school educational levels; iii) women seem to be less optimistic than men; iv) the IGAE annual percentage variation has a positive and statistically significant effect on respondents' optimism; and v) the labor reform has made a positive contribution to the employment expectations for the country, while the fiscal reform has had the opposite effect.[7]

To better understand the results in Appendix B, the influence (or the so-called partial effects) of the explanatory factors on the probabilities of the three replies ("will increase", "will stay the same" and "will fall") was quantified. Tables 1 and 2 show how these probabilities are affected by such factors for each gender.

Table 1
Probabilities estimated by the model with macroeconomic variables for a male person*

Region/Education	will increase				will stay the same				will fall			
	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.07	0.06	0.06	0.04	0.31	0.30	0.28	0.26	0.62	0.64	0.66	0.70
Touristic	0.28	0.27	0.27	0.20	0.36	0.36	0.34	0.35	0.36	0.38	0.40	0.45
Industrial	0.22	0.21	0.21	0.15	0.37	0.37	0.34	0.35	0.41	0.43	0.45	0.50
Medium Development	0.23	0.22	0.22	0.16	0.41	0.40	0.38	0.39	0.36	0.38	0.40	0.45
High Marginalization	0.11	0.10	0.10	0.07	0.41	0.40	0.37	0.36	0.48	0.50	0.52	0.56

*/ A multinomial logit model was estimated without considering the reply option "don't know "; only information from January 2011 to January 2014 was used. Probability values were obtained using averages for the unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

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[5] Instead of using the complete micro data sample since January 2003, it was decided to do the econometric exercise with the information corresponding to the economic recovery years (with the exception of 2010) following the global financial crisis of 2008-2009.
[6] The regional groups were decided according to their economic vocation and development level: Highly developed: Distrito Federal; Touristic: Baja California Sur and Quintana Roo; Industrial: Aguascalientes, Baja California, Coahuila, Chihuahua, Jalisco, Estado de México, Nuevo León, Querétaro, Sonora, Tamaulipas; Medium Development: Campeche, Colima, Durango, Guanajuato, Hidalgo, Michoacán, Morelos, Nayarit, Puebla, San Luis Potosí, Sinaloa, Tabasco, Tlaxcala, Veracruz, Yucatan, Zacatecas; High Marginalization: Chiapas, Guerrero and Oaxaca. For more information about the method used to carry out this regional analysis, see Situación Regional Sectorial México, "Agrupamiento Regional, Cómo y Para Qué", November 2007, BBVA Bancomer.
[7] The apparent differences between the employment expectations in the country between people with different educational levels or between men and women may in fact be reflecting the differences in the average incomes of these groups.

Table 2
Probabilities estimated by the model with macroeconomic variables for a female person*

Region/Education	will increase				will stay the same				will fall			
	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.05	0.05	0.05	0.03	0.29	0.28	0.26	0.24	0.66	0.67	0.70	0.72
Touristic	0.23	0.22	0.22	0.16	0.36	0.36	0.33	0.34	0.40	0.42	0.45	0.50
Industrial	0.18	0.17	0.17	0.12	0.37	0.36	0.34	0.34	0.45	0.47	0.49	0.54
Medium Development	0.19	0.18	0.18	0.13	0.41	0.40	0.38	0.38	0.40	0.42	0.44	0.49
High Marginalization	0.09	0.08	0.08	0.06	0.39	0.38	0.36	0.34	0.52	0.54	0.56	0.60

*/ A multinomial logit model was estimated without considering the reply option "don't know"; only information from January 2011 to January 2014 was used. Probability values were obtained using averages for the unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

Respondents from the Touristic region show the greatest optimism about employment expectations for the country

Tables 1 and 2 illustrate how the Touristic region tends to be the most optimistic of all regions, followed by the Medium Development, Industrial and High Marginalization regions. In fact, the respondents from the High Development region are the only ones to have an employment expectation for the country which is predominantly pessimistic (see "will fall" column in Tables 1 and 2).

Employment expectations for the country exhibit little variation across different levels of education

Optimistic expectations about employment are very similar among several of the educational levels with the exception of "none or preschool" (see "will increase" column in Tables 1 and 2). Finally, a comparison between Tables 1 and 2 shows that men are slightly more optimistic than women in terms of employment expectations for the country over the next 12 months (see "will increase" column in Tables 1 and 2).

To gain an insight into the impact of the labor and fiscal reforms on employment expectations for the country, two exercises were conducted. In the first experiment the impact of the fiscal reform on the probabilities was removed while in the second one a similar procedure was carried out to cancel the labor reform effect. Therefore we could identify the effect of each reform on the probabilities by comparing them with those shown in Tables 1 and 2.

The probabilities of the three replies without the effect of the fiscal reform are shown in Tables 3 and 4.

Table 3
Probabilities estimated by the model with macroeconomic variables for a male person after cancelling the effect of the fiscal reform*

	will increase				will stay the same				will fall			
Region/Education	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.09	0.09	0.08	0.06	0.35	0.34	0.32	0.31	0.56	0.57	0.60	0.63
Touristic	0.34	0.33	0.33	0.25	0.37	0.37	0.35	0.37	0.29	0.30	0.32	0.38
Industrial	0.27	0.26	0.26	0.20	0.39	0.39	0.37	0.38	0.33	0.35	0.37	0.42
Medium Development	0.28	0.27	0.27	0.21	0.43	0.42	0.40	0.42	0.29	0.31	0.33	0.38
High Marginalization	0.14	0.13	0.13	0.10	0.45	0.44	0.41	0.41	0.41	0.43	0.45	0.49

*/ A multinomial logit model was estimated without considering the reply option "don't know"; only information from January 2011 to January 2014 was used. Probability values were obtained using averages for the unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

Table 4
Probabilities estimated by the model with macroeconomic variables for a female person after cancelling the effect of the fiscal reform*

	will increase				will stay the same				will fall			
Region/Education	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.07	0.07	0.07	0.05	0.34	0.32	0.30	0.29	0.59	0.61	0.63	0.67
Touristic	0.29	0.28	0.28	0.21	0.38	0.37	0.35	0.37	0.33	0.35	0.37	0.42
Industrial	0.23	0.22	0.22	0.16	0.40	0.39	0.37	0.37	0.38	0.39	0.42	0.47
Medium Development	0.24	0.23	0.23	0.17	0.43	0.43	0.40	0.41	0.33	0.35	0.37	0.42
High Marginalization	0.11	0.11	0.11	0.08	0.44	0.43	0.40	0.39	0.45	0.47	0.49	0.53

*/ A multinomial logit model was estimated without considering the reply option "don't know"; only information from January 2011 to January 2014 was used. Probability values were obtained using the average unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

The fiscal reform increased consumer pessimism about employment expectations for the country

A comparison of the probabilities of the reply "will fall" in Table 3 and 4 with those in Tables 1 and 2 indicates that respondents are on average 7 centesimal points more pessimistic across all levels of educational attainment when the fiscal reform effect is included.

The probabilities of the three replies without the labor reform effect are presented in Tables 5 and 6.

Table 5
Probabilities estimated by the model with macroeconomic variables for a male person after cancelling the effect of the labor reform*

Region/Education	will increase				will stay the same				will fall			
	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.06	0.06	0.05	0.04	0.30	0.29	0.26	0.25	0.64	0.66	0.68	0.71
Touristic	0.26	0.25	0.24	0.18	0.36	0.35	0.33	0.34	0.38	0.40	0.42	0.48
Industrial	0.20	0.19	0.19	0.14	0.37	0.36	0.34	0.34	0.43	0.45	0.47	0.52
Medium Development	0.21	0.20	0.20	0.15	0.41	0.40	0.38	0.38	0.38	0.40	0.42	0.47
High Marginalization	0.10	0.09	0.09	0.06	0.40	0.39	0.36	0.35	0.50	0.52	0.55	0.58

*/ A multinomial logit model was estimated without considering the reply option "don't know"; only information from January 2011 to January 2014 was used. Probability values were obtained using averages for the unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

Table 6
Probabilities estimated by the model with macroeconomic variables for a female person after cancelling the effect of the labor reform*

Region/Education	will increase				will stay the same				will fall			
	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool	More than high school	High school	Elementary or secondary	None or preschool
High Development	0.05	0.04	0.04	0.03	0.28	0.27	0.25	0.23	0.67	0.69	0.71	0.74
Touristic	0.21	0.20	0.20	0.15	0.36	0.35	0.33	0.33	0.43	0.45	0.47	0.52
Industrial	0.16	0.15	0.15	0.11	0.36	0.35	0.33	0.33	0.47	0.49	0.52	0.56
Medium Development	0.17	0.16	0.16	0.12	0.40	0.39	0.37	0.37	0.42	0.44	0.47	0.51
High Marginalization	0.08	0.07	0.07	0.05	0.38	0.37	0.34	0.33	0.54	0.56	0.58	0.62

*/A multinomial logit model was estimated without considering the reply option "don't know"; only information from January 2011 to January 2014 was used. Probability values were obtained using averages for the unemployment rate and the IGAE annual percentage variation.
Source: BBVA Research with data from INEGI

The labor reform had a positive effect on consumer employment expectations for the country

A comparison of the probabilities of the "will fall" reply in Tables 5 and 6 with those in Tables 1 and 2 indicates that those surveyed are on average 2 centesimal points less pessimistic across all levels of educational attainment when the labor reform effect is included.

Conclusions

The main findings of this analysis are as follows: i) consumer employment expectations for the country have shown negative annual growth rates since February 2013; ii) respondents from the Touristic, Medium Development, Industrial and High Marginalization regions tend to be more optimistic than those from the High Development region; iii) optimism about employment expectations for the country show little variation across different levels of educational attainment; iv) good performance on the part of the country's economic activity, measured through the IGAE indicator, has a positive impact on these expectations; and v) the labor reform has made a favourable contribution to employment expectations for the country, whereas the fiscal reform has had the opposite effect.

It is important to point out that the findings of this analysis are derived from estimating a multinomial logit model with a specific econometric specification and observations from the period between January 2011 and January 2014. Also, the ENCO survey was designed to be representative at a national level and is not representative by any of the socio-demographic characteristics such as region, gender or educational level. Therefore, the aforementioned results should be taken with a certain degree of caution.

References

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Appendix A

Using Wooldridge's mathematical notation (2002), the multinomial logit model consists of the following: let y be a random variable that can take on the values k = 0, 1,…, $C-1$ where C is a positive integer and represents the total number of classes; let x be a vector ($1 \times N$) of explanatory variables with the first element equal to the unit. Thus, the multinomial logit model has class probabilities:

$$P(y = k|x) = \exp(x\beta_k) \Bigg/ \left[1 + \sum_{h=1}^{C-1} \exp(x\beta_h)\right], \quad k = 1, \ldots, C-1, \qquad (A.1)$$

where β_k ($N \times 1$), $k = 1, \ldots, C-1$. Since the class probabilities have to add up to one, then

$$P(y = 0|x) = 1 \Bigg/ \left[1 + \sum_{h=1}^{C-1} \exp(x\beta_h)\right]. \qquad (A.2)$$

The model given by the equations (A.1) and (A.2) was applied to the replies to question 13 with the aim of establishing whether the region, the educational level, the gender of respondents and other macroeconomic variables could influence consumer employment expectations for the country. For this purpose, dummy variables were used to represent regions, the gender and various levels of education defined in an arbitrary way.

Appendix B

This appendix shows the econometric results for three specifications: 1) the model that only uses socio-demographic factors; 2) the model with socio-demographic factors and macroeconomic variables; and 3) the model with socio-demographic factors and dummy variables to control for possible monthly seasonal variations in replies.

The results of the econometric estimations for the reply "will increase" are shown below.

Table 7
Estimation of the logit model: odds ratios for the reply "will increase"

	Socio-demographic factors	With macroeconomic variables added	With monthly dummy variables added
Intercept	0.1 ***	0.1 ***	0.1 ***
	(-40.9)	(-7.8)	(-33.2)
Touristic	7.2 ***	7.2 ***	7.2 ***
	(30.2)	(30.2)	(30.2)
Industrial	5.0 ***	5.0 ***	5.0 ***
	(34.3)	(34.3)	(34.4)
Medium Development	5.9 ***	5.9 ***	5.9 ***
	(37.4)	(37.4)	(37.5)
High Marginalization	2.1 ***	2.1 ***	2.1 ***
	(11.2)	(11.3)	(11.3)
None or preschool	0.6 ***	0.6 ***	0.6 ***
	(-8.8)	(-8.9)	(-8.8)
Elementary or secondary	0.9 ***	0.9 ***	0.9 ***
	(-6.8)	(-6.8)	(-6.8)
High school	0.9 ***	0.9 ***	0.9 ***
	(-3.2)	(-3.1)	(-3.1)
Woman	0.7 ***	0.7 ***	0.7 ***
	(-14.4)	(-14.4)	(-14.5)
Unemployment rate		1.0	
		(-0.1)	
IGAE's annual variation (%)		1.0 **	
		(2.0)	
Labor reform		1.2 ***	
		(3.9)	
Fiscal reform		0.7 ***	
		(-10.1)	
Pseudo R^2	0.02	0.02	0.02
Correct class predictions (%)	43.9	44.1	43.9

This table shows odds ratios and t statistics in parenthesis. In the case of socio-demographic factors, higher (lower) odds ratios than one would indicate that the coefficient of the probability of replying "will increase" over the probability of replying "will fall" for a given region, level of education or gender is higher (lower) than the ratio corresponding to the region, level of education or gender which has been omitted in the econometric specification. As far as the macroeconomic variables are concerned, higher (lower) odds ratios than one would signal a positive (negative) influence of such variable on the ratio of the probability of replying "will increase" over the probability of replying "will fall".
* Significant at 10%; ** to 5%; *** to 1%.
Source: BBVA Research with data from INEGI

From the table above we notice that the odds ratios are insensitive to the aggregation of macroeconomic variables or dummy variables for controlling for the monthly seasonality of replies. The model with macroeconomic variables, meanwhile, is the best predictor of replies inside the sample. Nevertheless, it is important to mention that the statistical significance of the labor reform and fiscal reform coefficients might be a consequence of the problem associated with omitting other relevant variables.

The results of the econometric estimations for the reply "will stay the same" are shown below.

Table 8
Estimation of the logit model: odds ratios for the reply "will stay the same"

	Socio-demographic factors	With macroeconomic variables added	With monthly dummy variables added
Intercept	0.6 ***	0.6 **	0.6 ***
	(-18.4)	(-2.2)	(-13.2)
Touristic	2.0 ***	2.0 ***	2.0 ***
	(13.8)	(13.8)	(13.8)
Industrial	1.8 ***	1.8 ***	1.8 ***
	(22.3)	(22.4)	(22.4)
Medium Development	2.3 ***	2.3 ***	2.3 ***
	(29.5)	(29.6)	(29.6)
High Marginalization	1.7 ***	1.7 ***	1.7 ***
	(13.7)	(13.7)	(13.7)
None or preschool	0.8 ***	0.8 ***	0.8 ***
	(-6.0)	(-6.0)	(-6.0)
Elementary or secondary	0.8 ***	0.8 ***	0.8 ***
	(-9.6)	(-9.6)	(-9.6)
High school	0.9 ***	0.9 ***	0.9 ***
	(-2.8)	(-2.7)	(-2.7)
Woman	0.9 ***	0.9 ***	0.9 ***
	(-6.7)	(-6.7)	(-6.7)
Unemployment rate		1.0	
		(-0.6)	
IGAE's annual variation (%)		1.0 *	
		(1.9)	
Labor reform		1.1 **	
		(2.3)	
Fiscal reform		0.8 ***	
		(-7.5)	
Pseudo R^2	0.02	0.02	0.02
Correct class predictions (%)	43.9	44.1	43.9

This table shows odds ratios and t statistics in parenthesis. In the case of socio-demographic factors, higher (lower) odds ratios than one would indicate that the ratio of the probability of replying "will stay the same" over the probability of replying "will fall" for a given region, level of education or gender is higher (lower) than the ratio corresponding to the region, level of education or gender which has been omitted in the econometric specification. As far as the macroeconomic variables are concerned, higher (lower) odds ratios than one would signal a positive (negative) influence of such variable on the ratio of the probability of replying "will stay the same" over the probability of replying "will fall".
* Significant at 10%; ** to 5%; *** to 1%.
Source: BBVA Research with data from INEGI

Like the results for the reply "will increase", the odds ratios are also insensitive to the aggregation of macroeconomic variables or dummy variables for controlling for the monthly seasonality of replies.

It is important to mention that the models with only socio-demographic factors and those which add macroeconomic variables are nested models. Consequently, we were able to conduct an analysis of variance to determine whether the macroeconomic variables provided incremental information to the estimation of the multinomial logit model. The tests showed the statistical relevance of including these variables. Moreover, another analysis revealed that the model with macroeconomic variables also outperforms the model with only one constant (the latter model makes the proportion of the observations of a class in the sample equal to the probability of that class), since this model correctly predicts 41.6% of the categories in the sample. Finally, when we compare the performance of these two models in terms of the area under the ROC curve, we found that the area under this curve, in the case of the model with added macroeconomic variables, is statistically different from 0.5 (this case is analogous to flipping a coin in the air or to that of the model with only one constant) for all the months in the survey between January 2011 and January 2014.