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The effect of financial innovation on European banks' risk☆

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ABSTRACT

This study examines the effect of the use of securitization and credit derivatives on the risk profile of European banks. Using information from 134 listed European banks during the period of 2006–2010, the results show that securitization and trading with credit derivatives have a negative effect on financial stability. The main findings also show the dominance of trading positions over hedging positions for credit derivatives. The results of this study support the higher capital requirements of the new Basel III international banking regulations. Furthermore, accounting measures do not readily indicate market risks, and thus the results support central banks' use of market-solvency measures to monitor financial stability.

1. Introduction

Recent economic theory presents two opposing views on the effects of securitization and credit derivatives on bank soundness. Some authors argue that both instruments improve financial stability, while others associate these processes with financial fragility. The securitization market could serve as a risk transfer mechanism and could therefore strengthen institutional solvency. Nevertheless, securitization potentially encourages the expansion of poorer quality credit and, therefore, impairs financial stability simultaneously. For credit derivatives in particular, although buying protection may intuitively reduce risk, the effect is not so great for intermediaries or those who sell protection. Norden, Buston, and Wagner (2011) highlight the scant evidence of the channels through which financial innovations affect financial institutions in adverse circumstances.

From these two views, and given the scarcity of empirical work, the question arises as to whether the financial innovations of securitization and credit derivatives affect the risk profile of European banks. Basel III, the new capital rules, increase capital requirements for both financial innovations. In this sense, researchers must determine whether empirical analysis supports an increase in capital requirements. Additionally, risk analyses drawing from market indicators or accounting may differ, hence the need to assess the risk of financial innovation considering both measures.

This work contributes to the existing literature by presenting unpublished evidence of the effect of securitization and credit derivatives on the default probability of listed European banks. Despite the importance of this issue, most existent studies focus on the US market and have a different focus in their analyses. This study uses Moody's expected default frequency (EDF) as a continuous measure of the probability of default, and Z-score as a risk-accounting measure. Further, the database of this study uses previously unused data with a more detailed breakdown of derivative positions available in the US market. Finally, the dynamic panel data methodology permits to control for endogeneity problems.

The organization of the article is as follows: first, the next section summarizes the main existing research on the effect of securitization and credit derivatives on banking; second, Section 3 describes the empirical analysis; defines the independent, dependent, and control variables; and provides a descriptive analysis of the sample; third, Section 4 presents the statistical model and shows the contrast between the hypotheses and the main results. Finally, Section 5 discusses conclusions and further topics of research.

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Table 1
Overview of the work on the effect of the use of securitization and credit derivatives.

Author(s)	Area of study	Region	Period	Methodology	Effect on financial stability
Greenbaum and Thakor (1987)	Securitisation			Theoretical analysis	(−)
Lockwood et al. (1996)		US	1985–1992	Events study	(+/−) depending on size
Cebenoyan and Strahan (2004)		US	1987–1993	Fixed effect	(+)
Instefjord (2005)				Theoretical analysis.	(+/−) depending on reinvestment
Uzun and Webb (2007)		US	Quarterly Data 2001	Panel data	+/− depending on the product
Krahnen and Wilde (2006)		–	–	Structural one-factor correlated default model.	(−)
Leland (2007)				Panel data	(−)
Hänsel and Krahnen (2007)	CDO	Europe	1997–2004	Standard event studies	–
Jiangli et al. (2007)	CLOs	–	–	Tobit regression.	(+/−) depending on risk distribution
Michalak and Uhde (2009)	Securitisation	Europe	1997–2007	Panel data	(−)
Shin (2009)				–	(−)
Michalak and Uhde (2012)		Europe (EU-13)	1997–2007	Panel data.	(−)
Otero et al. (2013)		Spain	2004–2008	Panel data. (GMM)	(−)
Duffee and Zhou (2001)	CDS			Theoretical analysis.	(+/−) depending on asymmetric information and adverse selection
Instefjord (2005)	Credit derivatives			Theoretical analysis.	(+/−) depending on market price elasticity
Morrison (2005)				Theoretical analysis.	(−)
Gibson (2007)				Theoretical analysis.	(−)
Shao and Yeager (2007)		US	1997–2005	Panel data	(−)
Minton et al. (2009)		US	1999–2005	Probit regression.	(+/−) depending on derivatives net position
Heyde and Neyer (2010)	CDS			Theoretical.	(−)
Stulz (2010)	CDS			Theoretical.	Neutral
Nijskens and Wagner (2011)	CLOs CDSs	Europe, North-America Asia, Australia	1998–2005	Theoretical.	(−)
Rodríguez et al. (2015)	Credit derivatives	Europe	2006–2010	Panel data. (GMM)	(+)

2. Literature review

Several studies highlight the fact that securitization is a stabilizing mechanism of the bank soundness (Jiangli, Pritsker, & Raupach, 2007). The studies that support this view explain that the reinvestment process can lead to greater diversification when reinvesting the resources in new conservative assets (Cebenoyan & Strahan, 2004). Other studies highlight the fragility of the reinvestment process, since most of the credit risk occurs in the first-loss tranche, which usually remains on the bank's balance sheet (Greenbaum & Thakor, 1987; Instefjord, 2005; Michalak & Uhde, 2012; Otero, Ezcurra, Martorell, & Mulet, 2013; Riddiough, 1997). Furthermore, if banks use the new resources to increase the asset base at a higher rate, to repurchase shares, or to pay a higher dividend, securitization can create an even greater leverage in the originator bank (Leland, 2007; Shin, 2009).

However, the existent evidence does not give conclusive results of the effects of securitization. On the one hand, several studies argue that securitization has a positive effect in general (Jiangli & Pritsker, 2008; Uzun & Webb, 2007) and on systematic risk (Franke & Krahnen, 2007; Hänsel & Krahnen, 2007; Lockwood, Rutherford, & Herrera, 1996; Michalak & Uhde, 2012). On the other hand, the literature on credit derivatives also contains contradictory views. Norden et al. (2011) highlight the difficulty of knowing a priori the effect of credit derivatives on financial stability. Batten and Hogan (2002), JP Morgan (2006), Mengle (2007), Angelini (2012), and Rodríguez, Otero, Cantorna, and Durán (2015) support the classic positive view that these products help reduce banks' risk, providing the best possible diversification and risk reduction, increased efficiency, greater liquidity, and transferring credit risk in the markets. However, a significant body of work supports the contrary view that entities may relax their

Table 2
Variables and hypotheses.

Varia	Prediction		Definition	Source
	EDF and credit risk proxies	*Z-Score*		
Expected default frequency to 1 year *[EDF1Y]*	Dependent variable		$PD = \phi[-DD]$	Moody's
Total risk of default *[Z-Score]*	Dependent variable		Ratio of the sum of equity capital to total assets and ROAA divided by the standard deviation of ROAA (sdROAA)	Bankscope, Authors' calculation
Securitization *[Securitiza]*	+	−	Outstanding balance of securitized assets/gross loans	Annual report and
Total net position *[totalnetpos]*	+	−	Total net position of credit derivatives/credit portfolio	Pillar III disclosures
Net position of trading *[tradnetpos]*	+	−	Net position of credit derivatives in the trading portfolio/credit portfolio	
Net position of hedging *[hedgingnet]*	−	+	Net position of credit derivatives in the hedging portfolio/credit portfolio	
Gross position credit derivatives *[cdgrosspos]*	+/−	+/−	Gross position of credit derivatives/credit portfolio	
Size *[Logtotalac]*	−	+	Log (total assets)	Bankscope
Profitability *[ROAA%]*	−	+	Net income/average total assets	
Net interest margin % *[Netinteres]*	−	+	(Interest income − interest expense)/assets	
Efficiency ratio % *[CosttoInco]*	+	−	Cost to income	
Liquidity % *[Liquidity]*	−	+	Liquid/deposits and short-term funding	
Credit portfolio % *[Netloansto]*	+	−	Net lending/total assets	
Gross loans to assets *[Grossloantoasset]*	+	−	Gross loans/total assets	
Equity ratio *[Equitytoas]*	+/−	+/−	Equity/total assets	
Gap assets and short-term liabilities *[GAP]*	+	−	(Liquid assets − deposits & short-term funding)/total assets	

Note: In this case, the signs that appear in the table refer to the relationship between the different variables and the variables global risk *EDF* and *Z-score*. The proxy for credit risk is the same as that for the variable *EDF*.

Table 3
Descriptive statistics for the variables in the sample.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
EDF *[EDF1Y]*	453	0,69	1.39	0.01	14.30
Total risk *[Z-Score]*	639	2.079	2.78	−3.06	16.60
Securitization *[Securitiza]*	670	0.04	0.08	0.00	0.59
Use of credit derivatives *[usodc]*	670	0.40	0.49	0.00	1.00
Net use of credit derivatives *[uso_neto_dc]*	670	0.45	0.50	0.00	1.00
Net trading position *[tradnetpos]*	617	−0.00	0.09	−2.03	0.71
Net trading position *[hedgingnet]*	617	0.00	0.01	−0.03	0.13
Gross position *[cdgrosspos]*	617	0,24	1,19	0.00	13,12
Gross loans to assets *[Grossloantoasset]*	618	0,57	0,22	0.00	1,01
Size *[Logtotalac]*	656	4.35	1.01	1.68	6.41
Equity ratio *[Equitytoas]*	655	0.11	0.15	0.00	0.97
Profitability *[ROAA%]*	655	0.85	2.93	−29.73	21.33
Net interest margin % *[Netinteres]*	652	2.25	3.72	−25.68	52.71
Efficiency ratio % *[CosttoInco]*	647	64.46	23.30	3.36	352.31
Liquidity % *[Liquidity]*	631	43.61	65.33	0.82	862.83
Credit portfolio % *[Netloansto]*	624	55.25	22.54	0.00	97.44
Gap assets and liabilities short-term *[GAP]*	640	−0.40	0.26	−0.89	0.53

policy on monitoring borrowers (Duffee & Zhou, 2001; Morrison, 2005), leverage up their capital structure (Jiangli & Pritsker, 2008; Minton, Stulz, & Williamson, 2009), increase their lending (Instefjord, 2005; Wagner, 2005), and increase their investments in illiquid, risky credit portfolios, thus creating a channel of contagion (Heyde & Neyer, 2010; Stulz, 2010).(See Table 1.)

3. Method

To analyze the effects of securitization and credit derivatives on European banks' overall risk and credit risk, the study considered a database from the consolidated financial statements, annual accounts, and Pillar 3 disclosure documents of 134 listed European banks during the period of 2006–2010. For testing securitization, the study followed Michalak and Uhde (2009) and built a database that contains the outstanding balance of securitized assets included in the annual accounts or in the published Pillar 3 disclosure documents. For the study of credit derivatives, the study followed Shao and Yeager (2007) and Minton et al. (2009) and used the total notional amount of credit protection bought and sold as a proxy for the use of derivatives. In addition, the study adopted Norden et al.'s (2011) proposal to also consider the gross positions.

3.1. Dependent variables

For a more exhaustive analysis, the study considered two measures representing bankruptcy risk. Drawing from the market, the study uses the expected default frequency (EDF), and the Z-score building on accounting information. With both variables, the study aims to evaluate whether the use of credit derivatives or securitization affects accounting and market measures. The expected results were that the market could sometimes consider risks that are not apparent from financial statements and vice versa. In particular, the study considered the one-year probability of default using Moody's EDF measure, in line with other empirical work (Agrawal, Arora, & Bohn, 2004; Bohn, 2000; Eichler & Sobański, 2012). Alternatively, others use the Z-score as a dependent variable; this ratio is a very common risk measure (Boyd & Runkle, 1993; De Nicoló, Bartholomew, Zaman, & Zephirin, 2004; Michalak & Uhde, 2009), since the ratio represents the inverse of the probability of a bank's insolvency. The Z-score ratio also measures the distance to insolvency drawing from accounting data.

3.2. Explanatory variables and hypotheses

When testing securitization, the explanatory variable was the outstanding securitized balance relative to gross loans (outstanding balance of securitized assets/gross loans). The expected sign drawing from the theoretical arguments were either positive or negative. Therefore:

H1. Securitization increases the overall risk of default of European financial institutions, as EDF and the Z-score measure.

Norden et al. (2011) expressly study four channels through which the active use of credit derivatives influences bank behavior and affects a bank's financial stability. Norden et al.'s (2011) work highlights the difficulty of knowing the effect of gross positions on financial stability a priori. The effect of credit derivatives could depend on either the net or the gross position. Therefore:

H2. Higher gross credit derivatives can decrease or increase the overall risk of default.

In line with Shao and Yeager (2007), Instefjord (2005), and Morrison (2005), trading net positions and working with protection sellers increases banks' exposure; thus:

H3. A greater net overall position increases the overall risk of default.

H4. A net trading position increases the overall risk of default.

Finally, hypothesis 5 examines whether hedging via derivatives decreases the probability of default (Mayers & Smith, 1982).

H5. A net-hedging portfolio decreases the overall risk of default.

In addition to the independent variables, the model includes a set of control variables drawing from Sarkisyan, Casu, Clare, and Thomas (2009); Shao and Yeager (2007); Iannotta, Nocera, and Sironi (2007); and Michalak and Uhde (2012). Table 2 summarizes all variables in the regression models.

3.3. Descriptive statistics

Table 3 presents the main descriptive statistics. The banks in the sample have an average market indicator of total risk (EDF to 1 year) of 0.69 and a Z-score of 2.07, although within a wide range of values.

Table 4
Evolution of securitization and credit derivatives by year (average).

	2006	2007	2008	2009	2010
Securitization	0.03	0.03	0.04	0.05	0.04
Net position of trading	−0.00	−0.00	−0.01	−0.00	0.01
Net position of hedging	0.00	0.00	0.00	0.00	0.00
Gross position	0.12	0.17	0.30	0.35	0.25

Table 5
Entities operating with securitization and credit derivatives, and net position.

	2006		2007		2008		2009		2010	
	N banks	%	N banks	%	N banks	%	N banks	%	N banks	%
Use securitization	38	28.3	42	31.3	49	36.5	50	37.3	42	31.3
Use credit derivatives	48	35.8	51	38.0	58	43.2	57	42.5	57	42.5
Net buyers of credit protection	13	9.7	17	12.6	23	17.1	22	16.4	21	15.6
Net sellers of credit protection	7	5.2	6	4.4	14	10.4	17	12.6	12	8.96

In fact, some banks have a negative Z-score, while others show values above 16. Looking at the variables that represent the use of credit derivatives, the average values are close to zero because a significant number of entities do not use these products. However, the range in these values shows the predominance of net-buying positions in the case of hedging positions, and net-selling positions in the case of trading operations, which in practice correspond to CDS products. Table 3 also shows that the gross positions of credit derivatives in the trading portfolio are greater than those in the hedging portfolio.

Table 4 shows the evolution of the securitization and credit derivatives positions during 2006–2010. Growth occurs until 2009 and declines in 2010 as the financial crisis intensified, while trading operations grew steadily. In contrast, hedging operations show a more irregular pattern, falling at the end of the period, possibly due to the increased costs during great financial instability.

Similarly, Table 5 shows that the number of credit protection entities with a net-buyer position exceeds those with a net-selling position every year, which could indicate that banks use these products more as hedging rather than as trading instruments. On average, the notional value of protection as a percentage of the total assets for net buyers and net sellers is 1.25% and 2.06%, respectively, which seems low and possibly relates to the limited ability of these products to hedge the credit portfolio risk.

3.4. Model

Most previous work uses a panel data methodology to analyze the effect of securitization on the risk that credit entities assume. In particular, Michalak and Uhde (2012) and Sarkisyan et al. (2009) estimate static models of both fixed and random effects, which are appropriate for strictly exogenous variables without endogeneity. Regarding credit derivatives, Shao and Yeager (2007) assert that endogeneity problems may affect the relationship between risk and credit-derivative use, because ex-ante risk measures that potentially correlate with ex-post risk measures can influence derivatives. Thus, the estimation results from static panel data may be inconsistent. This study instead chose a methodology building from dynamic panel data, using the generalized method of moments (GMM), which deals optimally with endogeneity. Arellano and Bover (1995) and Blundell and Bond (1998) design the system of GMM estimators for situations with small T and large N panels, as in this case. The dynamic panel data model to estimate the effect of securitization and credit derivatives in the banking sector stability is

$$Y_{it} = \alpha_{it} + \beta_1 Y_{it-1} + \beta_2\,[Securitiza]_{it} + \beta_3 CD_{it} + \beta_4[Netinteres]_{it} + \beta_5[CosttoInco]_{it} + \beta_6[Liquidity]_{it} + \beta_7[Netloansto]_{it} + \beta_8[logtotalassets]_{it} + \beta_9[GAP]_{it} + \sum_{t=1}^{5} Year_t + \varepsilon_{it} \quad (1)$$

This model evaluates the risk measure of a particular entity i in the period t determined by the volume of securitization and credit derivatives, in addition to a set of control variables. Further, ε_{it} represents the error term, whereas α and β denote the parameters to estimate. The parameters β_2 and β_3 refer to the independent variables. For the specific case of credit derivatives, this study aims to build as many models as the number of independent variables ([totalnetpos]

Table 6
EDF models (GMM method).

	EDF1Y	*EDF1Y*	*EDF1Y*	*EDF1Y*
EDF1Y t-1	0.56*** (0.00)	0.55*** (0.00)	0.53*** (0.00)	0.55*** (0.00)
Securitization	1.72* (0.09)	1.43 (0.23)	1.89* (0.09)	1.71* (0.08)
Gross position credit derivatives	−0.05 (0.46)			
Total net position		0.69* (0.10)		
Net position of *trading*			1.31** (0.02)	
Net position of *hedging*				−5.29* (0.10)
Size	−0.12 (0.19)	−0.15** (0.04)	−0.17** (0.04)	−0.11 (0.14)
Net interest margin	−0.01 (0.86)	−0.00 (0.94)	−0.01 (0.70)	0.00 (0.93)
Efficiency ratio	0.00 (0.16)	0.00 (0.20)	0.00 (0.22)	0.00 (0.2)
Liquidity	0.01 (0.21)	0.01 (0.23)	0.01 (0.18)	0.01 (0.27)
Credit portfolio	0.00 (0.11)	0.01* (0.06)	0.01 (0.11)	0.00 (0.19)
Gap assets and liabilities short-term	−0.49 (0.60)	−0.26 (0.79)	−0.37 (0.73)	−0.30 (0.76)
Year 2007	0.97*** (0.00)	0.98*** (0.00)	0.99*** (0.00)	0.96*** (0.00)
Year 2008	−0.62*** (0.00)	−0.61*** (0.00)	−0.59*** (0.00)	−0.61*** (0.00)
C	−0.47 (0.44)	−0.48 (0.47)	−0.50 (0.45)	−0.38 (0.58)
M2	1.41 (0.16)	1.42 (0.16)	1.36 (0.17)	1.42 (0.16)
Hansen test	82.71 (0.83)	81.39 (0.86)	84.74 (0.79)	80.82 (0.87)
Number of observations	336	336	336	336

Panel data estimates for the generalized method of moments where the dependent variable is the EDF to 1 year. The study analyzed the possible existence of specification errors, the level of model fit, normality, and multicollinearity. According to Arellano and Bond (1991), as the number of periods is small relative to the number of companies, so the researchers take as valid instruments all possible lagged values of variables from t-2 for efficiency. In addition, to eliminate the individual effect of each company, the researchers transformed the variables into first differences. M2 is the contrast of second-order serial correlation using the waste in first differences, asymptotically distributed as N (0.1) under the null hypothesis of no serial correlation. Hansen is a test to over-identify restrictions, asymptotically distributed as a $\chi 2$ under the null hypothesis of no relationship between instruments and error, verifying the validity of the instruments (degrees of freedom in parentheses).

* Significance at 10% level.
** Significance at 5% level.
*** Significance at the 1% level.

Table 7
Z-score models (GMM method).

	Z-score	*Z-score*	*Z-score*	*Z-score*
Z-score t-1	0.68*** (0.00)	0.73*** (0.00)	0.72*** (0.00)	0.72*** (0.00)
Securitization	−2.16** (0.02)	−2.37** (0.01)	−2.68* (0.07)	−2.53* (0.09)
Gross position credit derivatives	0.15* (0.07)			
Total net position		0.76 (0.48)		
Net position of *trading*			0.61 (0.62)	
Net position of *hedging*				7.41** (0.05)
Size	0.05 (0.701)	0.25** (0.02)	0.33** (0.01)	0.21 (0.12)
Net interest margin	0.02 (0.63)	0.01 (0.88)	0.07 (0.87)	0.00 (0.97)
Efficiency ratio	−0.03** (0.00)	−0.03 (0.00)	−0.03** (0.00)	−0.03** (0.00)
Liquidity	0.00 (0.48)	0.00 (0.78)	0.00 (0.76)	0.00 (0.74)
Credit portfolio	0.01 (0.31)	0.00 (0.44)	0.00 (0.48)	0.01 (0.23)
Gap assets and liabilities short-term	−0.30 (0.65)	0.51 (0.42)	0.51 0.43	0.46 (0.50)
Year 2007	0.26 (0.10)	0.27* (0.05)	0.24* (0.08)	0.26* (0.09)
Year 2008	0.22* (0.06)	0.32** (0.01)	0.26** (0.03)	0.25* (0.06)
C	1.16* (0.06)	0.78 (0.23)	0.67 (0.32)	0.88 (0.03)
M2	−0.16 (0.88)	−0.26 (0.79)	−0.22 (0.82)	−0.07 (0.94)
Hansen test	103.81 (0.27)	110.16 (0.32)	106.13 (0.43)	112.3 (0.29)
Wald (χ2)		307.70 (0.00)	296.13 (0.00)	287.99 (0.00)
Number of observations	476	476	476	476

* Significance at 10% level.
** Significance at 5% level.
*** Significance at the 1% level.

[tradnetpos], [hedgingnet], [cdgrosspos]). This study accomplishes this by alternating between the different independent variables in the parameter β_3.

4. Results

Tables 6 and 7 show the results for each variable. The tables show that securitization has a significant positive effect on EDF and a negative effect on the Z-score in most models, thus supporting H1. This result suggests that the increased use of securitization has a negative effect on European banks' financial stability. The results are in line with previous studies highlighting the fragility stemming from the securitization process (Franke & Krahnen, 2007; Hänsel & Krahnen, 2007; Lockwood et al., 1996; Michalak & Uhde, 2012).

The use of credit derivatives for trading purposes has a significant negative effect on the financial stability market measure The results support H3 and H4, showing that mismatched positions can affect bank soundness. By contrast, banks that hedge with credit derivatives improve financial stability, in line with the proposal in H5. However, the gross position is not significant. This result may reflect the fact that including all positions in the gross derivatives could offset the opposing effects.

For the Z-score, as for EDF, these products have a positive effect when they function as hedging instruments and for the gross position, supporting H2 and H5. Therefore, European banks using credit derivatives for hedging purposes or having a greater overall gross-position experience improve their accounting financial stability (Z-score). These results are consistent with Shao and Yeager's (2007), as these authors conclude that credit derivatives have a positive effect on net-protection buyers. However, no literature confirms that trading activities reduce financial stability. In short, the results of this study suggest that when institutions use credit derivatives for hedging purposes, they can improve their risk indicators; thus, these results support the stability hypothesis (Angelini, 2012).

The analysis supports the consensus of the negative effect of securitization on market and accounting financial stability. The study also supports the positive effect of credit-derivative hedging positions. However, the results differ for the trading portfolio. The market identifies the negative effects of net trading positions, despite its absence from the accounting measure. This finding indicates that the market could value risks not visible in accounting terms. The gross positions positively affect accounting financial stability, though not significantly the market. This result could be explained by the fact that gross positions improve the accounting measure trough the diversification of the business. Table 8 summarizes the results of each hypothesis.

Table 8
Results summary.

Hypotheses:		Proxies stability	
		Financial stability (market measure)	Financial stability (accounting measure)
H1	Sign	-	-
	Significant	Yes	Yes
H2	Sign	+	+
	Significant	Not	Yes
H3	Sign	-	+
	Significant	Yes	Not
H4	Sign	-	+
	Significant	Yes	Not
H5	Sign	+	+
	Significant	Yes	Yes

5. Conclusion

This study examines the effect of securitization and credit derivatives on stability in the banking sector. The analysis shows that securitization has a negative effect on financial stability, which the study measures through market and accounting measures following previous studies highlighting the fragility that the securitization process brings about (i.e., Michalak & Uhde, 2012).

Credit derivative use has a positive effect on financial stability when banks use them as hedging instruments. This study highlights their positive effect through both the market and accounting indicators. This result is in line with Shao and Yeager (2007) and Norden et al.'s (2011). However, the results differ in the case of other uses of credit derivatives. The market identifies the negative effects of net trading and overall net positions, despite their invisibility in the accounting measure. The gross positions affect accounting financial stability, though not significantly for the market. This could mean that markets can value unperceived risks in accounting terms. In fact, the overall net position reduces financial stability, indicating the predominance of net trading positions over hedging ones, possibly indicating that trading generates risks that the market rates negatively, but that do not appear in the accounting analysis.

According to the results, the study concludes that securitization and certain credit derivative uses have a negative effect on European banks' financial stability. The results also support the higher capital requirements in the new Basel III regulations regarding speculation. Furthermore, since the market seems to value the risks not perceived in accounting terms, the results suggest that central banks should use market solvency measures to monitor solvency.

Further research could aim to improve EWS, the estimation of capital requirements, and incorporate fuzzy methodology in the estimates.

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