EARLY WARNING SYSTEMS FOR BANKING CRISSES:
DOES GOVERNANCE QUALITY MATTER?

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ABSTRACT
There is a large and important literature on the causes of systemic banking in the last twenty years, the world economy has been faced with a significant number of financial crises, from Latin America, to Asia, from Nordic Countries to East and Central European countries, it all culminated with the financial tsunami which burst in 2007. A new and critical need for the Early Warning Systems (EWS) has appeared since 2008: an updated EWS that would correctly include in the model the way financial markets are affected by changes in risk factors and risk transmission.

AIM
The intention of this thesis is to provide a more coherent understanding to these ‘crises’ in the aspects as to what could be the possible causes. Providing a EWS model, it can make available the correct and timely warning for an onset of a shock into the banking system. The paper will also look into and address a number of critical issues in the related literature, including robustness of statistical results to model specification, variable definitions, and lag structure; and the ability of these types of empirical models to predict and forecast the onset of banking crises out-of-sample.

OBJECTIVES
Thus, the study is on the determinants of the probability of banking crisis using a logit specification with annual data. The sample includes a large sample of countries over the period of 1985-2013, of which those included had the available date for the specific variables chosen within thesis model. Many countries in our sample do not experience banking crises in the above period. However, the proposed model will also include additional datasets in order to capture Corporate Governance, Market Competition and Banking regulation.

THEORETICAL METHOD
The theoretical definitions of identify the types and causes of financial crises grew into the empirical research that applied a statistical econometric model to that banking crisis phenomenon.

Thus, historical literature formed empirical models with differing methodologies in order to provide a model which captures the banking crises elements and turn this into a structure to produce an early warning system. Although there have been several methodologies.

Multivariate logit/probit model - This model was intuitive through the paper by Demirgüç-Kunt & Detragiache, 1998. A logit econometric model is fitted to the data and an estimate of the crisis probability is obtained by maximising the likelihood function. Thus, the model produces a summary measure of fragility (the estimated probability of crisis) which makes the best possible use of the information in the explanatory variables (subject to the hypothesised functional form) (Demirgüç-Kunt & Detragiache, 1998).

This model has developed extensively by Demirgüç-Kunt & Detragiache and other leading authors. This includes methodology enhancements, through differing predictive powers, robustness testing and out of sample testing. One major element which has been developed, is through the variables used to test within the model.

WHY THIS MODEL?
- Multivariate logit model is used as it can easily identify the sources of fragility by calculating the contribution of each explanatory variable to a change in the estimated probability of a crisis.

- Empirically this structured element within the model has proven to be of a critical factor and provided significant results, therefore an element which did not change when testing the model with a larger data sample.

- The justification of this model over that of the signals approach is that the explanatory variable choice will enable me to test other categories of variables and help eliminate any type I or Type II errors as well as the significant problematic element of hesteroskity.

METHODOLOGY
Accordingly, the dependent variable, the crisis dummy, takes the value 0 (no crisis) and the value 1 (is a crisis). The probability that a crisis will occur at a particular time in a particular country is hypothesized to be a function of a vector of n explanatory variable X(i, t). Let P(i, t) denote a dummy variable that takes the value of one when a banking crisis occurs in country i and time t and a value of zero otherwise. \beta is a vector of n unknown coefficients and F(\beta'X(i, t)) is the cumulative probability distribution function evaluated at \beta'X(i, t).

The log-likelihood function of this model is:

\[ \ln L = \sum_{t=1}^{T} \sum_{i=1}^{n} \left( P(i, t) \ln [F(\beta'X(i, t))] + (1 - P(i, t)) \right) \]