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Dynamics of non-performing loans in the Turkish banking sector by an ownership breakdown: The impact of the global crisis

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ABSTRACT

This paper explores the impact of the global crisis on the dynamics of non-performing loans in the Turkish banking sector by ownership. Estimation results suggest that the crisis affected these dynamics differently across banks, which implies that policy implications are uneven. This has important consequences regarding the effectiveness of monetary and the macroprudential policy, which prompt policymakers to consider ownership in policy design. To enhance policy effectiveness, adding ownership-specific explanatory variables may enable better representation of the non-performing loan dynamics. A vintage loan analysis may also help by allowing policymakers to directly identify the loan type, which generates non-performing loans.

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1. Introduction

Non-performing loans (NPLs) have attracted renewed attention in recent years. This is due to the growing interest developed for understanding the variables liable to financial vulnerability. NPL is such an indicator that is closely associated with weaknesses in the financial system. This can be confirmed by the strong link observed between the surge in NPLs and the occurrence of banking crises. In fact, [Reinhart and Rogoff \(2011\)](#) point out that the rise in NPLs can be used to mark the onset of a banking crisis, while [Sorge \(2004\)](#) recommends the use of NPLs to test the vulnerability of the financial system.

In addition, NPLs have gained significance also after the global crisis. In particular, the global crisis prompted a surge in NPLs, thereby posing risks to liquidity and profitability of the banking system and financial stability in turn. In fact, [Erdinc and Abazi \(2014\)](#) report that the emerging Europe has been hardest hit by the crisis given their mounting levels of NPLs in the aftermath of the crisis. [Aiyar et al. \(2015\)](#) also state that the crisis has left many countries with elevated levels of NPLs, especially in southern parts of the Euro area, as well as in Eastern and Southeastern Europe. Similarly, [Jassaud and Kang \(2015\)](#) discuss that high and rising levels of NPLs in Italy continue to weigh on banks' balance sheets since the onset of the crisis.

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Turkish banks were also exposed to mounting risks associated with higher NPLs in the post-crisis period. In fact, [CBRT \(2010\)](#), [Selçuk \(2010\)](#) and [Afşar \(2011\)](#) show that NPLs increased sharply after the crisis. Moreover, [Ganioğlu and Us \(2014\)](#) and [Us \(2015a, 2015b\)](#) discuss that the global crisis challenged the Turkish banking sector, while [Us \(2015b\)](#) display that the dynamics of NPLs have changed after the crisis and ownership¹ is a key factor in this change.

The evidence that the dynamics of NPLs have changed after the crisis and the fact that ownership is central to this change raise an important question. In particular, what is the impact of the global crisis on the dynamics of NPLs by an ownership breakdown? Accordingly, given earlier works by [Louzis et al. \(2012\)](#), [Salas and Saurina \(2002\)](#), [Jiménez and Saurina \(2006\)](#), [Ranjan and Dhal \(2003\)](#), [Klein \(2013\)](#), [Ganioğlu and Us \(2014\)](#) and [Us \(2015a, 2015b\)](#), this paper explores whether the significance of selected bank-specific, macroeconomic and policy-related determinants changes with respect to the NPL dynamics for each ownership category before and after the crisis.

The paper is organized as follows: The next section gives a brief overview on the determinants of NPLs. The following section introduces data, the econometric methodology and the estimation results. The final section concludes. The Appendix presents [Tables A1–A4](#) for data description and the estimation results.

2. The determinants of NPLs

This section discusses briefly about the determinants of NPLs, which can be broadly defined as factors pertaining to bank-specific as well as macroeconomic and policy-related conditions. These variables are by no means exhaustive, but they suffice to provide a useful framework for analyzing the effect of the global crisis on the dynamics of NPLs in the Turkish banking sector by an ownership breakdown. Accordingly, the expected impact of these variables can be described as follows:

2.1. Bank-specific determinants

The capital adequacy (regulatory capital or capital requirement) of a bank is an important determinant of NPLs. [Berger and DeYoung \(1997\)](#) report a negative link between capital requirement and NPLs based on the moral hazard hypothesis, which asserts that thinly capitalized banks are more susceptible to risk taking. [Keeton and Morris \(1987\)](#) and [Salas and Saurina \(2002\)](#) also state that banks with low capital carry greater risk, which causes them to have higher NPLs.

On the other hand, [Makri et al. \(2014\)](#) assert that banks with high capital adequacy ratios may have high NPLs. [Boudriga et al. \(2009\)](#) state that this may be due to the absence of strict enforcement of laws, while [Ahmad and Ariff \(2007\)](#) attribute this to the banks' need for capital as a cushion against credit risk associated losses. [Koehn and Santomero \(1980\)](#) and [Rime \(2001\)](#) also observe a positive relationship between bank risk and capital adequacy by stating that higher capital may encourage banks to escalate the riskiness of their assets, which may result in higher NPLs.

Bank lending is also a significant determinant of NPLs. In particular, [Salas and Saurina \(2002\)](#) and [Jiménez and Saurina \(2006\)](#) report higher NPLs for increased bank lending. [Klein \(2013\)](#) also observes a positive link between NPLs and lending. [Keeton and Morris \(1987\)](#) assert that excess lending of banks may result in higher impaired loans. Similarly, [Sinkey and Greenwalt \(1991\)](#) discuss that excessive lending may cause increased NPLs. Yet, [Khemraj and Pasha \(2009\)](#) and [Vithessonthi \(2016\)](#) argue that lending and NPLs are negatively linked due to stringent lending standards.

The inefficiency of a bank is another important determinant of NPLs. [Berger and DeYoung \(1997\)](#) argue that inefficiency leads to higher NPLs due to poor loan underwriting, monitoring and cost control. This can be generalized as the bad management hypothesis, which is also supported by [Espinoza and Prasad \(2010\)](#), [Podpiera and Weill \(2008\)](#) and [Louzis et al. \(2012\)](#).

On the other hand, [Berger and DeYoung \(1997\)](#) also postulate the skimping hypothesis, which conjectures a negative link between inefficiency and NPLs. Accordingly, banks that devote less effort to ensure higher loan quality are more cost-efficient, yet they carry higher number of NPLs in the long run. In fact, [Rossi et al. \(2008\)](#) observe that NPLs may increase amid high cost efficiency.

Bank size is also a crucial bank-specific determinant of NPLs. [Hu et al. \(2004\)](#) and [Ranjan and Dhal \(2003\)](#) report that larger banks have a better chance to evaluate loans, which leads to lower NPLs. [Salas and Saurina \(2002\)](#), [Saunders et al. \(1990\)](#), [Chen et al. \(1998\)](#), [Cebenoyan et al. \(1999\)](#), [Megginson \(2005\)](#) and [Louzis et al. \(2012\)](#) also find a negative relation between bank size and NPLs and argue that bigger size allows for more diversification opportunities. Conversely, [Stern and Feldman \(2004\)](#) assert that too-big-to-fail banks may take excessive risk, which causes them to end up with higher NPLs.

Finally, ownership dispersion is also viewed to have an impact on NPLs. In a seminal study, [Fama \(1980\)](#) discusses that an efficient capital market imposes discipline on firm's management, and therefore, dispersed ownership should have a

¹ [Hu et al. \(2004\)](#) argue that state banks have higher NPLs due to lobbying, while private banks have higher NPLs due to corrupt owners. [Khawaja and Mian \(2005\)](#) find that state banks tend to favor firms with politically connected directors by lending more and allowing for higher default rates. [Micco and Panizza \(2005\)](#) and [Zribi and Boujelbène \(2011\)](#) discuss that state banks have higher NPLs as they may have to finance risky projects. Similarly, [Novaes and Werlang \(1995\)](#) observe that state banks have greater NPLs due to non-payment of loans granted to the government. [Sapienza \(2004\)](#) and [La Porta et al. \(2002\)](#) also report higher NPLs for state banks. [De Nicolo \(2001\)](#) and [Iannotta et al. \(2007\)](#) argue that state banks typically exhibit higher risk than other banks. Also, [Micco et al. \(2004\)](#) observe higher NPLs for state banks in developing countries.

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