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Loan loss provisioning of US banks: Economic policy uncertainty and discretionary behavior

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ABSTRACT

This paper examines the effect of economic policy uncertainty (EPU) on loan loss provisions (LLP). Using a sample of 6384 US banks and yearly data from 2009 to 2019 and addressing endogeneity (GMM and IV estimations), the findings reveal that in times of higher economic policy uncertainty, banks tend to increase their loan loss provisioning. Considering the four components of EPU, the findings document that the majority of the explanatory power on loan loss provisions originates from news-based and tax expiration indices. Moreover, US banks discretionally use loan loss provisions in normal times, especially for capital management and income smoothing. In uncertain times, they use provisions for income smoothing rather than capital management and after controlling for the discretionary behavior, the positive relationship of EPU and LLPs continue to hold. Additional analysis indicates that private banks conduct more income smoothing through provisions in uncertain times as compared to listed banks. The findings of the study highlight EPU as an additional procyclical factor to influence bank provisioning behavior and offer some relevant policy implications.

1. Introduction

Economic policy uncertainty (EPU) refers to uncertainty regarding economic policies such as monetary, fiscal or regulatory policy, and it derives mainly from whether existing policies will change in the future or the unknown impact of new policies on the economy and the private sector (Baker et al., 2016; Ng et al., 2020). The uncertainty in economic policies implemented by the governments confuses the economic agents due to their unpredictable nature and opacity, which, in turn, leads to asymmetric information (Nagar et al., 2019). The banking industry is very sensitive to economic policy decisions and banks immediately react and become unwilling to finance more debt. Economic policy uncertainties, especially those that affect banking business, can affect the loan portfolio of banks through many channels such as reduced bank lending (Talavera et al., 2012), rising interest rate (Brewer, Deshmukh, & Opiela, 2014), high nonperforming loans (Lepetit et al., 2012), fall in asset prices and volume of securitization (Cheng et al., 2011).

A growing literature examines the impact of policy uncertainty on financial institutions and the impact on aggregate bank lending. Such studies show that high policy uncertainty leads to loan repricing by banks (Ashraf & Shen, 2019), a significant decrease in credit availability and credit growth (Nguyen et al., 2020; Caglayan & Xu, 2019; Bordo et al., 2016; Hu & Gong, 2019; Bilgin et al., 2020), a decrease in bank valuations (He & Niu, 2018), and also policy uncertainty can undermine financial stability (Phan et al., 2020; Berger

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et al., 2018). However, there are very limited studies that explore the impact of economic policy uncertainty on banks' reporting decisions and loan loss provisioning. In this paper, we examine whether US banks' accrual estimates, loan loss provisions, are sensitive to high economic policy uncertainty. We focus on US banks because policy uncertainty has fluctuated significantly in the United States due to increases in government spending, taxes and regulation, and political interference in the policy-making process (Baker et al. 2014, 2016), and there is evidence that such high policy uncertainty can provide incentives for US banks to alter their financial reporting and performance outcomes in ways that minimize the impacts of policy uncertainty on banks' financial reporting and performance (Kara & Yook, 2019; Ng et al., 2020).

Loan loss provisions (LLPs) are the most important accruals in banks (Beatty & Liao, 2011), and they mainly arise from expected loan losses and the significant discretion that bank managers have in determining the size of loan loss provisions estimates (Bushman & Williams, 2015; Curcio & Hasan, 2015). Understanding how banks' loan loss provisions react to economic policy uncertainty is important because banks have a critical role in providing credit to the domestic economy and any resulting provisions more than necessary can impair bank lending, profitability and economic growth (Ng et al., 2020). Furthermore, the procyclicality of LLPs has gained increasing attention after the global financial crisis of 2008–2009 as banks tend to hold higher provisions due to the identification of problem loans during economic slowdowns. However, such procyclical provision behavior amplifies economic shocks, further destabilizes the financial system, and misallocates lending resources. The factors that enhance the bank lending cyclicality are accepted as risks to economic and financial stability and consequently, the optimum amount of provisioning attracted special attention while countercyclicality measures into prudential regulation were introduced after the global financial crisis of 2007–2008 (Bouvatier & Lepetit, 2012; Soedarmono et al., 2017). For instance, International Accounting Standards Board (IASB) has put in place a new provisioning standard after the global financial crisis of 2008–2009, which requires banks to make provisions for potential loan losses basing upon a forward-looking, expected losses model (Balla & Rose, 2015).

Banks faced with high economic policy uncertainty will keep higher loan loss provisions as a precaution in anticipation of unknown future events that might affect banks' loan portfolios. However, the studies in literature related to the impact of economic policy uncertainty on banks' reporting decisions and loan losses are very limited. In fact, to our knowledge, Ng et al. (2020) and Jin et al. (2019), are the only existing studies that focus on the impact of EPU on loan loss provision behavior, and they find that banks set aside higher loan loss provisions in times of higher policy uncertainty. Banks, under asymmetric information caused by increasing economic policy uncertainty, would anticipate an increase in loan defaults and set aside more LLP accruals (Chi and Li, 2017; Bushman & Williams, 2015). Besides, a considerable body of literature shows that the level of provisions is largely influenced by factors other than credit risk (Dou et al., 2018; Olszak et al., 2017; Kim et al., 2019; Peterson & Arun, 2018) which might make the relationship between economic policy uncertainty and LLPs less clear (Beatty and Liao, 2011). This is because bank managers can use their discretion in loan loss provisioning to alter financial reporting and performance outcomes to meet some desired outcome. They might conduct such discretionary behaviors even more during uncertain times, which would provide a useful cover for banks where they can blame policymakers for the additional losses incurred, caused by high policy uncertainty (Ng et al., 2020). Banks can use discretionary loan loss provisions particularly for income smoothing purposes (El Sood, 2012; Ozili, 2019), capital management (Curcio & Hasan, 2015), signaling purposes (Kanagaretnam et al., 2005; Tran et al., 2019) and to reduce the transparency of reported earnings (Kanagaretnam et al., 2009). We extend this literature by predicting that economic policy uncertainty is another risk factor that bank managers will take into account when making provisioning decisions and the positive impact of EPU on provisions will continue to hold even after controlling for the discretionary behaviors such as capital management, income smoothing or signaling.

Our study extends the two related studies, namely, Ng et al. (2020) and Jin et al. (2019), in the following ways. The LLP literature clearly demonstrates the three main discretionary behaviors: capital management, income smoothing, and signaling (Soedarmono et al., 2017; Bouvatier & Lepetit, 2012). Ng et al. (2020) and Jin et al. (2019) focus on income smoothing behaviors and they do not consider capital management as discretionary behaviors in their empirical specification which is a drawback. Beatty and Liao (2011) state that the identification of earnings versus capital management is a serious challenge in the literature due to the fact that LLPs decrease both earnings and capital in the current regulatory regime. In contrast, in our paper, we calibrate the discretionary components of LLP into income smoothing, signaling and capital management components, and examine the effect of EPU on LLP accounting for each of the three discretionary behaviors. While Ng et al. (2020) mainly use fixed effects panel data estimation techniques, Jin et al. (2019) use the two-step least-squares (2SLS) Instrumental Variable (IV) approach. We extend their results using both dynamic panel data estimation techniques with Generalized Method of Moments (GMM) estimators and IV regressions with 2SLS estimators and properly account for endogeneity because LLP is highly affected by its previous values (Bouvatier and Lepetit, 2008, 2012; Soedarmono et al., 2017).

To study the link between EPU and loan loss provisions for US banks, we rely on the EPU index introduced in Baker et al. (2016). This index consists of four components: the news-related, tax code expirations, disagreement over CPI forecasts, and disagreement over government purchases forecasts. The recent literature widely uses this index to examine the economic consequences of economic policy uncertainty (e.g., Ashraf & Shen, 2019; Berger et al., 2018; Bordo et al., 2016; Caglayan & Xu, 2019; He & Niu, 2018; Hu & Gong, 2019; Nguyen et al., 2020; Phan et al., 2020). Using a sample of 6384 US banks and yearly data from 2009 to 2019, we find that high EPU leads to increase in non-discretionary loan loss provisioning, and the majority of the explanatory power on loan loss provisions originated from the news-based and tax expiration components. There is also evidence that, in normal times, US banks use discretionary loan loss provisions for capital management and income smoothing purposes. Regarding the probable impact of managerial discretion on the link between EPU and provisions, we discover that US banks use provisions for income smoothing rather than capital management during times of high EPU and provisions are magnified with such behavior. Additional analysis regarding the type of banks highlights that private banks conduct more income smoothing through provisions under uncertain times as opposed to listed banks.

Our study makes two important contributions to the literature. First, it contributes to the recent literature on economic policy uncertainty. Prior studies showed the economic consequences of policy uncertainty on firms' corporate decisions and banks' lending

decisions (e.g., Ashraf & Shen, 2019; Baker et al., 2016, 2014; Berger et al., 2018; Bordo et al., 2016; Caglayan & Xu, 2019; He & Niu, 2018; Hu & Gong, 2019; Kim & Kung, 2017; Nguyen et al., 2020; Nguyen & Phan, 2017; Phan et al., 2020). Our paper complements these studies by showing that loan loss provisions are sensitive to economic policy uncertainty and as banks anticipate higher loan losses in times of higher policy uncertainty, they have a tendency to hold more provisions. Second, our paper contributes to the banking literature that investigates the determinants of LLPs under unique conditions such as regulatory changes and during financial crisis periods. These studies show that banks alter provisions to achieve certain outcomes in times of regulatory changes and financial crises (e.g. Aristei & Gallo, 2019; Balla & Rose, 2015; Beck & Narayanamoorthy, 2013; DeBoskey & Jiang, 2012; El Sood, 2012; Kilic et al., 2013; Ng & Roychowdhury, 2014). We add to this literature by showing that policy uncertainty, just like regulatory changes, is another determinant of LLPs in banks.

The remainder of the paper is organized as follows. Section 2 presents the empirical design including the data, research design and the hypotheses. Section 3 discusses the results. Finally, last section concludes and provides implications.

2. Empirical design

2.1. Data sources

We collect the bank-level data from FitchConnect, which is a comprehensive database providing data both on publicly listed and private banks around the world. The initial sample includes 7366 US commercial cooperative & savings banks for the years 2009–2019. We then consider banks that provide information on assets, loans, and non-performing loans (Bouvatier et al., 2014; Bouvatier & Lepetit, 2012) which leaves us with 6384 banks as our final sample. We follow Soedarmono et al. (2017) and eliminate any zero values in the variables so as to prevent unavailable data being treated as zero. All bank-level variables are winsorized at the levels 1% and 99% to mitigate the influence of outliers.

2.2. Hypothesis development

We aim to test whether US banks hold higher LLPs following periods of higher economic policy uncertainty. Economic policies implemented by the governments confuse economic agents in the society due to their opacity and unpredictability, generating asymmetric information and uncertainty shocks (Nagar et al., 2019). The banking industry is one of the most sensitive industries and banks immediately respond to policy uncertainties by adjusting their strategies for lending decisions. They become less willing to provide credit in anticipation that borrowers would have more difficulty in their loan repayments. Banks, under asymmetric information caused by economic policy uncertainty, would anticipate an increase in the loan defaults and set aside more LLP accruals (Chi and Li, 2017; Bushman & Williams, 2015).

The earnings and capital management literature emphasize agency problems that arise from the information asymmetry between banks, equity investors and regulators which have implications for financial reporting and loan loss provisions (Beatty & Liao, 2011; Bushman & Williams, 2015). The level of discretionary provisions is found to be affected by factors other than problematic loans (Bouvatier & Lepetit, 2012; Olszak et al., 2017; Peterson & Arun, 2018). Banks can act discretionarily to achieve desired outcomes on their financial reporting and performance, and three main behaviors are documented in the literature: capital management, income smoothing and signaling.

First, it is documented in the literature that banks might use their provisions in an attempt to maintain their regulatory capital levels, particularly the banks with capital ratios about to violate the regulatory capital requirements. A negative relationship between capital management and LLP is stated showing that when banks have low capital levels, they would have a tendency to hold more LLP (Anandarajan et al., 2007; Curcio & Hasan, 2015). Second, banks may have motivations to smooth reported income using provisions when their today's income levels are good but future expectations are negative. In that case, they may save today's current income by overstating loan loss provisions and a positive relationship is observed between income levels and provisions (Kanagaretnam et al., 2003; El Sood, 2012; Ozili, 2019). Third, when estimating loan loss provisions, bank managers might also be motivated to use their discretion to signal and communicate private information associated with positive future prospects. In this regard, a positive link is observed between favorable future income prospects and loan loss provisions (Kanagaretnam et al., 2005; Tran et al., 2019). Therefore, these three discretionary behaviors are likely to magnify or smoothen the relationship between EPU and LLP.

In this paper, in line with Ng et al. (2020) and Jin et al. (2019), we expect to find that banks will have a tendency to accumulate higher provisions during times of high economic policy uncertainty (EPU). Banks face increased information asymmetry in uncertain periods and as a precaution they would be more likely to set aside more LLP accruals to compensate for the possible increase in the loan defaults. We also benefit from EPU index having the following four components for the US: "the news-based", "the tax expirations index", "the CPI forecast disagreement", and "the federal, state, local purchases disagreement" which represent policy uncertainties originating from different angles such as economic, fiscal and monetary dimensions. We expect to observe that these four components are likely to exert different influences on LLP and examining them separately will help better understand which type of uncertainty is more relevant in banks' provisioning decisions. Moreover, we test whether the impact of EPU on provisions depends on whether banks use provisions for the discretionary purposes. While the effect of EPU on LLPs might be expected to change (increase or decrease) when discretionary purposes are accounted for, we still expect to observe that banks will have a tendency to accumulate higher provisions during times of high EPU. The reasoning is that in times of higher economic policy uncertainty, banks would be under high pressure due to asymmetric information, and they would prioritize the probable increase in their loan defaults over earnings and capital management and set aside more LLP accruals to account for their problematic loans (Chi and Li, 2017; Bushman & Williams, 2015). For these

purposes, we specify our hypotheses as follows:

Hypothesis 1a. Economic policy uncertainty increases loan loss provisions.

Hypothesis 1b. The impact of the four components of EPU on LLPs will be different.

Hypothesis 2. The effect of EPU on LLPs depends on the extent to which banks use LLPs for discretionary purposes such as capital management, income smoothing, or signaling.

2.3. Methodology

Following the extant literature on loan loss provisioning (Bouvatier and Lepetit, 2008, 2012; Soedarmono et al., 2017), we use dynamic panel data estimation with two-step system GMM (SGMM) estimators (Blundell & Bond, 1998) with robust standard errors. Baltagi (2005) highlights that the SGMM is more efficient as compared to the standard GMM. Our reasoning for using a dynamic model is that loan loss provisioning is dynamic and highly affected by the previous year's behavior. Moreover, we consider the reverse causality and control for endogeneity with our dynamic specification in that our model accounts for the fact that explanatory variables might be affected by the LLP behavior. We employ forward orthogonal transformations equation as suggested by Arellano and Bover (1995) and report two-step estimator utilizing the Windmeijer's (2005) finite sample correction. Following Bouvatier and Lepetit (2012), we limit the number of instruments by using lag-limits as 4 and use the "collapse option" (Roodman, 2009). While only the lagged dependent variable is instrumented using "GMM-style" instruments; other variables in the model are taken as strictly exogenous. In addition to dynamic panel data techniques with two-step system GMM estimators, we also conduct IV regressions with 2SLS estimators for robustness to control for potential endogeneity.

The empirical specification is based on Bouvatier and Lepetit (2008; 2012) which decomposes LLP into discretionary and non-discretionary components and distinguishes three main discretionary behaviors: capital management, income smoothing and signaling. We use the following empirical models:

$$LLP_{it} = \alpha_1 LLP_{it-1} + \alpha_2 EPU_t + \alpha_3 LOAN\ SHARE_{it} + \alpha_4 NPL_{it} + \alpha_5 \Delta NPL_{it} + \alpha_6 GDP\ growth_t + \varepsilon_{it} \quad (1a)$$

$$LLR_{it} = \alpha_1 LLR_{it-1} + \alpha_2 EPU_t + \alpha_3 LOAN\ SHARE_{it} + \alpha_4 NPL_{it} + \alpha_5 \Delta NPL_{it} + \alpha_6 GDP\ growth_t + \varepsilon_{it} \quad (1b)$$

$$LLP_{it} = \alpha_1 LLP_{it-1} + \alpha_2 EPU_t + \alpha_3 X_{it} + \alpha_4 LOAN\ SHARE_{it} + \alpha_5 NPL_{it} + \alpha_6 \Delta NPL_{it} + \alpha_7 GDP\ growth_t + \varepsilon_{it} \quad (2a)$$

$$LLR_{it} = \alpha_1 LLR_{it-1} + \alpha_2 EPU_t + \alpha_3 X_{it} + \alpha_4 LOAN\ SHARE_{it} + \alpha_5 NPL_{it} + \alpha_6 \Delta NPL_{it} + \alpha_7 GDP\ growth_t + \varepsilon_{it} \quad (2b)$$

$$LLP_{it} = \alpha_1 LLP_{it-1} + \alpha_2 EPU_t + \alpha_3 X_{it} + \alpha_4 EPU_t{*}X_{it} + \alpha_5 LOAN\ SHARE_{it} + \alpha_6 NPL_{it} + \alpha_7 \Delta NPL_{it} + \alpha_8 GDP\ growth_t + \varepsilon_{it} \quad (3a)$$

$$LLR_{it} = \alpha_1 LLR_{it-1} + \alpha_2 EPU_t + \alpha_3 X_{it} + \alpha_4 EPU_t{*}X_{it} + \alpha_5 LOAN\ SHARE_{it} + \alpha_6 NPL_{it} + \alpha_7 \Delta NPL_{it} + \alpha_8 GDP\ growth_t + \varepsilon_{it} \quad (3b)$$

where i stands for banks and t stands for time, respectively. While the emphasis in Models (1a) and (1b) is on the determinants of LLP that show the non-discretionary behavior of banks, Models (2a) and (2b) include the discretionary terms, X, which stand for proxies of discretionary managerial actions regarding capital management, income smoothing and signaling.[1] The aim in Models (2a) and (2b) is to test whether managerial discretionary behavior exists in our sample for LLPs and LLRs. Models (3a) and (3b) include the interaction terms, EPU*X, which aims to explore whether discretionary behaviors are adjusted under policy uncertainties.

2.4. Variables

The list of variables and their brief descriptions are provided in Table 1 and Table 2 presents the descriptive statistics. The main dependent variable is calculated as the ratio of loan loss provisions to gross loans (LLP) and we also use loan loss reserves to gross loans (LLR) as an alternative dependent variable for robustness considerations. Table 2 shows that the average LLP in our sample is 0.35% and the LLP average is 0.94%.

EPU is the economic policy uncertainty index for the US developed by Baker et al. (2016). The index measures uncertainty related to policy actions such as who will take such actions, which actions will be undertaken and when, and their economic impacts, reflecting the decision-making uncertainty implications of regulatory officials and governments (Akron et al., 2020). The index is calculated monthly in the database and, to match our sample's frequency, we transform it into yearly by taking a weighted average with weights of 1 and 2 for the first and last 6 months of a year. EPU Overall V1 is the overall index measures policy-related economic uncertainty and it is constructed as a weighted average based upon the following underlying four components: ½ weight on broad news-based policy uncertainty index (EPU NEWS), a weight of 1/6 for each the remaining three components being the CPI forecast disagreement measure

[1] Specifically, X includes the variables CAPITAL, INCOME and SIGNAL. Following Doan et al. (2020), Bouvatier et al. (2014), Soedarmono et al. (2017), Hu and Gong (2019), and Bouvatier and Lepetit (2008, 2012), CAPITAL is defined as equity to total assets, INCOME is constructed as the ratio of earnings before taxes and loan loss provisions to total assets and SIGNAL shows the change in INCOME from year t+1 to year t.

Table 1
Variable descriptions.

Dependent variables	Description
LLP	Loan loss provisions/Gross loans
LLR	Loan loss reserves/Gross loans
Independent variables	
EPU Overall V1	US Overall EPU index constructed by Baker et al. (2016). The index is a weighted average of the four components: 1/2 wt on the broad news-based policy uncertainty index and weight of 1/6 on each of the other three components (the tax expirations index, the CPI forecast disagreement measure, and the federal, state, local purchases disagreement measure). The index is available monthly and we calculate EPU V1 yearly as a weighted average with weights of 1 and 2 for the first and last 6 months of a year.
EPU Overall V2	US Overall EPU index which is calculated yearly as monthly average of all twelve months.
EPU Overall V3	US Overall EPU index which is calculated yearly as weighted average with weights of 1, 2, 3 and 4 for the first, second, third and last quarters of a year.
EPU NEWS	The news-based component of the policy uncertainty measure developed by Baker et al. (2016)
EPU CPI	The CPI forecast disagreement measure component of EPU, drawing upon the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters.
EPU TAX	The tax expirations component of EPU that is based on reports by the Congressional Budget Office (CBO) that compile lists of temporary federal tax code provisions.
EPU GOV SPENDING	The government spending disagreement component of EPU, drawing upon the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters.
LOAN SHARE	Net loans/Total assets
NPL	Nonperforming loans/Gross loans
ΔNPL	The first difference of NPL (NPL at time t – NPL at time t-1)
CAPITAL	Equity to total assets ratio
INCOME	The ratio of earnings before taxes and loan loss provisions (ER) to total assets
SIGNAL	(INCOME at t+1− INCOME at t) where INCOME is defined as above
GDP GROWTH	Real GDP growth rate

Table 2
Descriptive statistics.

Variable	N	Mean	Min	Max	SD
LLP	59222	0.35%	−0.60%	3.79%	0.62%
LLR	59104	0.94%	0.13%	3.26%	0.52%
EPU Overall V1	63840	135.48	83.79	193.42	33.60
EPU NEWS	63840	143.58	92.47	188.70	24.75
EPU CPI	63840	561.00	18.92	1597.30	584.83
EPU TAX	63840	85.20	55.74	123.40	24.94
EPU GOV SPENDING	63840	85.93	67.35	139.13	20.91
EPU Overall V2	63840	129.49	87.06	172.25	26.77
EPU Overall V3	63840	134.31	84.92	186.20	31.96
LOAN SHARE (%)	59436	62.56%	16.89%	89.74%	15.76%
NPL (%)	51459	2.38%	0.02%	15.56%	2.81%
ΔNPL (%)	43970	−0.27%	−5.86%	4.70%	1.44%
GDP GROWTH (%)	63840	2.28%	1.60%	2.90%	0.46%
CAPITAL (%)	59439	11.33%	5.01%	26.70%	3.44%
INCOME (%)	59177	1.27%	−1.30%	4.47%	0.81%
SIGNAL (%)	52721	0.01%	−1.59%	1.71%	0.43%

(EPU CPI), the tax expirations index (EPU TAX), and the federal, state, local purchases disagreement measure (EPU GOV SPENDING). The first component, EPU News index, draws on the search results of 10 large newspapers in the U.S., searching for the terms related to "uncertainty", "economy", "policy". The second component, EPU TAX, is generated from the temporary federal tax code provisions reports of Congressional Budget Office (CBO). Such temporary tax measures create a source of uncertainty for businesses and households because they are often extended without prior notice. The third and fourth components, EPU CPI and EPU GOV SPENDING, are calculated based on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. They are measured by the dispersion of the forecasts of CPI and purchases of goods and services by state, local governments, and the federal government, respectively. These forecasts are highly influenced by fiscal and monetary policy actions.

The descriptive statistics in Table 2 indicate that the EPU Overall V1 index has a minimum of 83.79 and a max of 193.42 with an average of 135.48 indicating the high volatility of uncertainty. While our main EPU measure is the EPU Overall V1, we also use the four components of the EPU index in our analysis for testing Hypothesis 1b. We further calculate overall EPU index in the two following alternative ways for robustness checks: EPU Overall V2 is calculated yearly as a monthly average of all twelve months and EPU Overall V3 is measured as a weighted average with weights of 1, 2, 3, and 4 for the first, second, third, and last quarters of a year, respectively.

The emphasis in Models (1a) and (1b) is on the determinants of LLP that show the non-discretionary behavior of banks. The impact of EPU on LLP is generally linked to the non-discretionary part of LLP as in the case of the procyclicality of LLP literature (Bouvatier and Lepetit, 2008, 2012). As being well-accepted in the LLP literature (Laeven & Majnoni, 2003; Bikker & Metzemakers, 2005), the non-discretionary component is mainly related to non-performing loans/gross loans (NPL) and the first difference of NPL (ΔNPL)

calculated as NPLi,t – NPLi,t −1. The loss in bank loan portfolios would be captured by NPL and ΔNPL and we expect to observe a positive relationship between for these two variables with LLP, showing that banks set aside higher LLP following a loss in their loan portfolios. The descriptive statistics in Table 2 indicate that the NPL average in our sample is 2.38% and ranges between 0.02% and 15.56%. Moreover, the average ΔNPL is −0.27% with a minimum of −5.86% and a maximum of 4.70%.

As a proxy for the overall credit portfolio default, we include LOAN SHARE calculated as net loans/total assets where a positive relationship is expected with LLP. The positive relationship indicates that when banks face higher credit risk, they tend to hold more LLPs. Table 2 displays that LOAN SHARE in our sample has an average of 62.56% and ranges between 16.89% and 89.74%. Finally, we include GDP GROWTH in the model, which is expected to influence LLP negatively, indicating the procyclicality of loan loss provisions. US GDP growth has an average of 2.28% over the years 2009–2019 with a minimum of 1.60% and a maximum of 2.90%.

X in Equations (2a)–(2b) stands for proxies of discretionary managerial actions related to capital management (CAPITAL), income smoothing (INCOME), and signaling (SIGNAL). CAPITAL is proxied by equity to total assets[2] And Table 2 indicates that equity to total assets in our sample has an average of 11.33% with a minimum of 5.01% and a maximum of 26.70%. INCOME is proxied by "the ratio of earnings before taxes and loan loss provisions to total assets" as in the literature (Bouvatier and Lepetit, 2008, 2012; Soedarmono et al., 2017).[3] As shown in Table 2, the INCOME variable in our sample has an average of 1.27% and ranges between −1.30% and 4.47%. As generally used in the LLP literature, we proxy SIGNAL by a one-year ahead change in earnings before taxes and loan loss provisions "INCOME at t+1− INCOME at t".[4] Table 2 reveals that SIGNAL has an average of 0.01% with a minimum of −1.59% and a maximum of 1.71%.

The correlation coefficients displayed in Table 3 do not indicate any multicollinearity issues, because the correlation between the independent variables are low.

3. Results

3.1. Baseline analysis

Table 4 documents the regression results where we use Equation (1a) as our model and LLP as the dependent variable. We investigate whether economic policy uncertainty has an influence on bank provisions. In column 1 we use EPU Overall V1 as our main independent variable of interest. We observe that an increase in EPU Overall V1 significantly increases LLP, showing that increases in economic policy uncertainties lead banks to accumulate higher LLPs, in line with Hypothesis 1a. The relationship is not only statistically but economically significant, implying that a one-unit increase in EPU leads to a 0.6% increase in LLP.

Having established how EPU influences provisioning behavior, we next examine which component of EPU matters the most to provisioning behavior. Considering the four components of EPU in Table 4 Columns 2–5; the findings reveal that the majority of the explanatory power on loan loss provisions originates from news-based and tax expiration indices. The coefficients of EPU GOV SPENDING and EPU CPI do not appear to be significant. This is in line with Hypothesis 1b where we indicate that the four components of EPU are expected to have a different impact on LLPs. While an increase in news-based and tax-expiration based components of EPU result in higher accumulation of LLPs; an increase in the CPI forecast and the federal, state, local purchases disagreement measures, on the other hand, do not have a significant impact on LLPs. This evidence documents that not all sources of economic policy uncertainty affect the provisioning behaviors of banks in the same way. This has crucial implications for policymakers as distinct sources of policy uncertainty would have different impacts of loan loss provisioning.

Next, Columns 6 and 7 use EPU Overall V2 and V3 as alternative calculations of overall EPU index and our results remain robust under these specifications. Considering the impact of control variables, LOAN SHARE and ΔNPL have a positive and statistically significant effect in all specifications, indicating that US banks use LLP for non-discretionary reasons such that higher loan share and increase in change of NPL are associated with higher LLPs. GDP GROWTH decreases LLP, in line with our expectations and procyclicality of LLP. These results are in line with prior literature documenting the procyclicality of loan loss provisions (Bouvatier & Lepetit, 2012; Soedarmono et al., 2017).

Column 8 in Table 4 uses instrumental variable (IV) estimation techniques to account for potential endogeneity of economic policy uncertainty and we re-estimate our regressions using the 2SLS IV approach. Following Gründler and Potrafke (2019) and Jeon et al. (2019), we use the following three instruments for EPU. First, we use the Transparency International's (TI) Perception of Corruption Index suggested by Gründler and Potrafke (2019). They indicate that the average of TI corruption index in the neighboring countries is a strong instrument for a country-specific uncertainty[5],[6]. And as the other two instruments we use the largest export and import market

[2] A negative relationship is generally observed in the literature between CAPITAL and LLP, implying that when banks have lower capital levels, they would have an incentive to hold more LLP (Bouvatier & Lepetit, 2012; Anandarajan et al., 2007).

[3] A positive relationship is expected between INCOME and LLP, meaning that as bank's income levels increase, they would have a tendency to hold more LLP to smooth their income so that reported earnings are never too high or too low (Bouvatier and Lepetit, 2008, 2012; Soedarmono et al., 2017).

[4] A positive relationship is documented in the literature under discretionary behavior between SIGNAL and LLP, indicating that banks signal their financial strength by increasing their LLP levels in response to increasing income levels (Leventis et al., 2012).

[5] TI corruption index is one of the most widely used indicator of corruption and ranks countries according to the corruption level of its public sector as perceived by experts and business executives. The data is extracted from the Transparency International's website (https://www.transparency.org/en/cpi). It takes values between 0 and 100 and lower values indicate a higher level of corruption. Since the US shares international borders with two nations, Canada and Mexico, we use the average value of their TI corruption indices as an instrument.

[6] We would like to thank the anonymous reviewer for suggesting TI corruption index as an instrument.

Table 3
Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) LLP	1															
(2) LLR	0.45	1														
(3) EPU Overall V1	0.24	0.11	1													
(4) EPU NEWS	0.11	0.02	0.71	1												
(5) EPU CPI	0.30	0.17	0.75	0.22	1											
(6) EPU TAX	0.28	0.18	0.55	−0.01	0.86	1										
(7) EPU GOV SPENDING	0.30	0.16	0.66	0.21	0.80	0.81	1									
(8) EPU Overall V2	0.29	0.14	0.93	0.68	0.85	0.68	0.78	1								
(9) EPU Overall V3	0.28	0.14	0.95	0.64	0.86	0.69	0.80	0.99	1							
(10) LOAN SHARE	0.05	0.29	−0.05	0.02	−0.10	−0.13	−0.09	−0.07	−0.07	1						
(11) NPL	0.40	0.46	0.18	0.04	0.25	0.28	0.25	0.22	0.22	−0.06	1					
(12) ΔNPL	0.07	−0.04	0.07	0.08	0.02	−0.02	0.07	0.06	0.06	0.0158	0.11	1				
(13) GDP GROWTH	−0.06	−0.06	−0.25	−0.27	−0.14	−0.26	−0.29	−0.30	−0.25	0.06	−0.08	−0.01	1			
(14) CAPITAL	−0.06	−0.03	−0.01	0.03	−0.07	−0.08	−0.05	−0.03	−0.03	−0.12	−0.04	0.01	0.03	1		
(15) INCOME	0.11	0.07	0.06	0.07	0.01	−0.02	0.02	0.04	0.04	0.20	−0.24	0.10	0.00	0.16	1	
(16) SIGNAL	0.06	−0.003	−0.03	−0.00	−0.04	−0.05	−0.03	−0.03	−0.03	0.01	−0.03	0.00	0.01	0.02	0.10	1

Table 4
EPU and Loan loss Provisions.

Variable	(1) (EPU Overall V1)	(2) (EPU NEWS)	(3) (EPU TAX)	(4) (EPU GOV SPENDING)	(5) (EPU CPI)	(6) (EPU Overall V2)	(7) (EPU Overall V3)	(8) (IV 2SLS)
EPU	0.006***	0.004**	0.003**	−0.00421	0.009	0.006**	0.006**	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LOAN SHARE	0.000***	0.001***	0.001***	0.001***	0.001***	0.001**	0.001***	0.007***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.006	0.007	0.005	0.008	0.006	0.006	0.006	0.062***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ΔNPL	0.022***	0.022***	0.024***	0.023***	0.023***	0.023***	0.022***	0.014***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
GDP GROWTH	−0.009**	−0.002**	−0.009	0.000	−0.015	−0.009**	−0.011**	−0.029
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
L.LLP	0.340**	0.332**	0.378**	0.339**	0.325**	0.323*	0.322**	
	(0.19)	(0.20)	(0.17)	(0.20)	(0.19)	(0.19)	(0.19)	
Observations	38421	38421	38421	38421	38421	38421	38421	37421
Number of Banks	6048	6048	6048	6048	6048	6048	6048	5933
Chi2	9893***	10155***	9655***	10115***	9973***	10038***	9878***	
AR1 p-value	0.042	0.058	0.015	0.056	0.059	0.054	0.048	
AR2 p-value	0.609	0.553	0.678	0.546	0.492	0.514	0.509	
Hansen p-value	0.183	0.199	0.237	0.233	0.23	0.241	0.259	0.566
Kleibergen-Paap Wald F test								117.48***

Note: This table shows results of EPU and LLP regressions. Columns 1–7 use dynamic panel data estimation with two-step system GMM estimators. Column 8 employs instrumental variable (IV) approach with two-Stage Least Squares regression (2SLS). Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.010.

country's EPU index.[7] The intuition is that the economic policy uncertainties in the major export and import partners of the US would likely to be contagious and induce an increase in the uncertainty of the US. However, the LLP behavior of banks is less likely to be directly affected by economic policy uncertainties and corruption levels in such countries. Our results are displayed in Column 8 show that The Kleibergen-Paap (2006) LM under-identification test reported at the bottom of the table shows that the instruments are valid and are jointly relevant to explain EPU. Besides, the over-identification test, Hansen J-statistics, indicates that instruments are not correlated with the error term. The coefficient of EPU is positive and significant which generates additional supportive evidence for earlier findings.

We go further in Table 5 and check the robustness of our findings using LLR as an alternative dependent variable as presented in Model (1b). All results remain robust under using an alternative variable for LLP, which strengthens our findings. Therefore, as well as increasing their provisions, banks also increase loan loss reserves in anticipation of economic policy uncertainties.

Table 6 investigates whether US banks act discretionarily when setting their LLP levels. As presented in Equations (2a)–(2b), we include three discretionary behaviors: capital management (CAPITAL), income smoothing (INCOME) and signaling (SIGNAL) in the regressions. Column 1 uses LLP, Column 2 uses LLR as dependent variables, respectively. The findings indicate that US banks discretionally use loan loss provisions, especially for capital management and income smoothing, but not for signaling purposes. The coefficient for the CAPITAL variable is negative and significant revealing that when US banks have low capital levels, they have a tendency for holding more LLP, in line with opportunistic capital management behavior (Anandarajan et al., 2007; Curcio & Hasan, 2015; Bouvatier et al., 2014).

The coefficient for the INCOME variable is positive and statistically significant. This shows that as banks report higher incomes, they tend to increase their LLP levels for the purposes of reporting a smoother income in line with the prior literature that documents income smoothing as a discretionary behavior of LLPs (Kanagaretnam et al., 2003; El Sood, 2012; Ozili, 2019; Gombola et al., 2016). The coefficient of SIGNAL variable appears to be not significant, revealing that signaling behavior of LLPs is not observed in US banks.

LOAN SHARE and ΔNPL continue to be positive and statistically significant and furthermore, NPL becomes positively significant which shows that the use of loan loss provisions for non-discretionary purposes is not altered when discretionary variables are included in the regressions. EPU still keeps its positive and significant impact on LLP and LLR. The coefficient of GDP GROWTH remains to be negative and significant.

Next, Table 7 explores the interaction of EPU and discretionary actions and reports the regression results of Equations (3a) and (3b). While Columns 1–3 use LLP, Columns 4–6 use LLR as dependent variables, respectively. In Table 7, LOAN SHARE, ΔNPL, NPL continues to be positively significant and the positive and significant impact of EPU on LLP and LLR is not altered. Considering the capital management variable, we consistently observe in Columns 1 and 4 that the link between CAPITAL and provisioning is negative and significant, consistent with opportunistic behavior and the findings in Table 6: a decline in capital ratios leads to higher accumulation of

[7] Major export and import markets of the US are Mexico and China, respectively, and the data is extracted from *the Observatory of Economic Complexity* website (https://oec.world/en/).

Table 5
EPU and Loan loss Reserves.

Variable	(1) (EPU Overall V3)	(2) (EPU News)	(3) (EPU Tax)	(4) (EPU Gov. Spending)	(5) (EPU CPI)	(6) (EPU Overall V1)	(7) (EPU Overall V4)
L.LLR	0.866***	0.868***	0.854***	0.863***	0.862***	0.865***	0.864***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
EPU	0.0014***	0.0037**	0.0015***	0.0011	0.0024	0.0015***	0.0018***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LOAN SHARE	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.006**	0.006***	0.007***	0.006***	0.006***	0.006**	0.006**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ΔNPL	0.029***	0.029***	0.029***	0.029***	0.029***	0.029***	0.029***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP GROWTH	−0.017***	−0.016***	−0.018***	−0.017***	−0.017***	−0.017***	−0.018***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	43903	43903	43903	43903	43903	43903	43903
Number of Banks	6088	6088	6088	6088	6088	6088	6088
Chi2	941,425***	971,452***	898,817***	940,009***	933,296***	944,013***	933,124***
AR1 p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR2 p-value	0.652	0.67	0.646	0.666	0.662	0.669	0.663
Hansen p-value	0.448	0.393	0.274	0.312	0.333	0.437	0.454

Note: This table shows results of EPU and LLR regressions. We use dynamic panel data estimation with two-step system GMM estimators. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.010.

Table 6
The influence of Discretionary behavior.

Variable	(1) LLP	(2) LLR
L.LLP	0.147***	
	(0.06)	
L.LLR		0.868***
		(0.03)
EPU	0.001***	0.002***
	(0.00)	(0.00)
LOAN SHARE	0.001**	0.002***
	(0.00)	(0.00)
NPL	0.025***	0.007***
	(0.01)	(0.00)
ΔNPL	0.010*	0.029***
	(0.01)	(0.00)
GDP GROWTH	−0.005	−0.015***
	(0.00)	(0.00)
CAPITAL	−0.011***	−0.002***
	(0.00)	(0.00)
INCOME	0.132***	0.027***
	(0.02)	(0.00)
SIGNAL	0.003	0.000
	(0.01)	(0.00)
Observations	33880	39349
Number of Banks	5990	6069
Chi2	9475***	900,598***
AR1 p-value	0.074	0.000
AR2 p-value	0.199	0.948
Hansen p-value	0.884	0.435

Note: This table shows results of EPU and LLR regressions. We use dynamic panel data estimation with two-step system GMM estimators. Robust standard errors in parentheses. *p < 0.10, **p < 0.05,***p < 0.010.

LLPs. However, the positive and significant coefficient of EPU*CAPITAL and negative and significant sum of coefficients of CAPITAL and EPU*CAPITAL lead us to observe that opportunistic capital management practices using loan loss provisions is offset under economic policy uncertainty and banks do not use capital management discretionarily in uncertain times.

Regarding the income smoothing variable, Columns 2 and 5 indicate that while the INCOME variable is not significant, the interaction with EPU is positive and significant. This implies that discretionary income smoothing behavior is only observed under

Table 7
The influence of EPU and discretionary actions.

Variable	(1) Capital	(2) (Income)	(3) (Signal)	(4) Capital	(5) (Income)	(6) (Signal)
	LLP			**LLR**		
L.LLP	0.298**	0.297*	0.149**			
	(0.19)	(0.18)	(0.06)			
L.LLR				0.861***	0.864***	0.865***
				(0.02)	(0.02)	(0.03)
EPU	0.0086**	0.0066***	0.001***	0.0031***	0.0015***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EPU*CAPITAL	0.0048*			0.004***		
	(0.00)			(0.00)		
CAPITAL	−0.008**			−0.0052***		
	(0.00)			(0.00)		
*EPU*CAPITAL + CAPITAL*	−0.003					
*EPU*CAPITAL + CAPITAL-p-value*	0.04					
EPU*INCOME		0.033***			0.0973***	
		(0.00)			0.00	
INCOME		0.005			−0.005	
		(0.02)			(0.01)	
EPU*SIGNAL			−0.001			0.000
			(0.00)			(0.01)
SIGNAL			0.003			−0.054
			(0.04)			(0.02)
LOAN SHARE	0.001***	0.00021	0.001***	0.002***	0.002***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.008	0.012*	0.012**	0.007***	0.007***	0.006**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
ΔNPL	0.021***	0.018***	0.017***	0.029***	0.029***	0.029***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
GDP GROWTH	0.001	−0.007	−0.011**	−0.012***	−0.015***	−0.017***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Observations	38421	38400	33880	43903	43843	39325
Number of Banks	6048	6047	5990	6088	6088	6069
Chi2	10221***	11137***	7363***	93380***	96677***	86669***
AR1 p-value	0.05	0.039	0.058	0.000	0.000	0.000
AR2 p-value	0.431	0.432	0.128	0.637	0.645	0.977
Hansen p-value	0.33	0.248	0.975	0.552	0.434	0.463

Note: This table shows the results of regressions that test whether the discretionary LLP behavior of US banks is adjusted under EPU. We use dynamic panel data estimation with two-step system GMM estimators. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.010.

uncertainties and US banks use LLPs for income smoothing only during such uncertain times. This finding is in line with El Sood (2012) which finds strong evidence of income smoothing behavior among US banks and documents that loan loss provisions are used intensively in crisis periods to smooth income upward. Columns 3 and 6 present the findings on signaling and it is seen that there is no significant usage of LLP for signaling purposes among US banks, even under economic uncertainties.

3.2. Additional analyses

We perform some additional analyses in Table 8. We observed from Table 7 that in times of higher economic policy uncertainties, US banks use LLPs for income smoothing rather than for capital management or signaling. We want to further examine whether being listed in a stock exchange market plays a role in such behavior. To test this, we create two dummy variables for private and listed banks and interact EPU*INCOME with private (PRIV) and listed (LISTED) bank dummies and include EPU*INCOME*PRIV and EPU-*INCOME*LISTED as interaction terms in our model. While Column 1 uses LLP, Column 2 incorporates LLR as dependent variables.

The findings from the interaction terms indicate that income smoothing under economic policy uncertainties is mainly observed for private banks but not listed banks. This is in line with Balla and Rose's (2015) results, which observe that shortly after the tightening of accounting constraints associated with the SEC's 1998 SunTrust decision, the relationship between earnings and provisions weakened for listed banks but not for private banks. This is expected because private banks are subject to less amount of regulations and monitoring and therefore are more open to managerial discretion (Balla & Rose, 2015; Nichols et al., 2009).

Furthermore, we want to examine whether the change in the US government with the last elections in 2016 affected the relationship between LLP and EPU. To test this, we include a dummy variable GOV CHANGE which is equal to 1 for the years 2016–2019 and 0 otherwise, and include the interaction term EPU*GOV CHANGE. The findings are presented in Columns 3 and 4 of Table 8 where LLP

Table 8
Additional analyses.

Variable	(1) LLP	(2) LLR	(3) LLP	(4) LLR
L.LLP	0.125*		0.416**	
	(0.07)		(0.16)	
L.LLR		0.864***		0.870***
		(0.02)		(0.03)
EPU	0.006***	0.002***	0.005**	0.001***
	(0.00)	(0.00)	(0.00)	(0.00)
EPU*INCOME*PRIV	0.003***	0.009***		
	(0.00)	(0.00)		
EPU*INCOME*LISTED	0.001***	0.007		
	(0.00)	(0.00)		
EPU*GOV CHANGE			−0.0009	−0.0006
			(0.00)	(0.00)
GOV CHANGE			0.042	0.011
			(0.00)	(0.01)
LOAN SHARE	0.0022	0.002***	0.004***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.012*	0.007***	0.005	0.006**
	(0.01)	(0.00)	(0.00)	(0.00)
ΔNPL	0.018***	0.029***	0.023***	0.029***
	(0.01)	(0.00)	(0.00)	(0.00)
GDP GROWTH	−0.007	−0.015***	−0.013**	−0.018***
	(0.01)	(0.00)	(0.01)	(0.00)
INCOME	0.004	−0.005		
	(0.02)	(0.01)		
Observations	38400	43843	38421	43903
Number of Banks	6047	6088	6048	6088
Chi2	11571***	966504***	10655***	971506***
AR1 p-value	0.039	0.000	0.016	0.000
AR2 p-value	0.425	0.646	0.945	0.661
Hansen p-value	0.26	0.434	0.34	0.252

Note: This table displays additional analyses. We use dynamic panel data estimation with two-step system GMM estimators. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.010.

and LLR are used as dependent variables, respectively. The variables GOV CHANGE and the interaction term EPU*GOV CHANGE neither appear to be significant and this shows that the recent government change has not affected the relationship between LLP and EPU. EPU exerts a positive and significant impact on LLPs irrespective of the government change. We further use split samples[8] as a robustness check where we split the sample into two which corresponds to the years 2009–2015 and 2016–2019 and perform the analysis without the GOV CHANGE dummy and the interaction term EPU*GOV CHANGE. Our results remain robust with split samples.

4. Conclusion and discussions

This paper examines whether US banks' accrual estimates, loan loss provisions, are sensitive to high economic policy uncertainties. We focus on US banks because the US has experienced several economic policy uncertainties especially in the last two decades (Baker et al. 2014, 2016). We use EPU as a measure of economic policy uncertainty, which has become a popular measure in the empirical literature since its release by Baker et al. (2016). Using a sample of 6384 US banks and yearly data from 2009 to 2019, we observe that banks increase their provisions following uncertain times. With regard to the four components of EPU, we observe that the majority of the explanatory power on loan loss provisions originates from news-based and tax expiration uncertainty indices. Furthermore, we find evidence that US banks discretionally use loan loss provisions in normal times for capital management and income smoothing. As regards to such discretionary behavior during uncertain times, we see that US banks use provisions for income smoothing rather than for capital management in such uncertain times, and this is implemented mainly by private banks as opposed to listed ones.

The findings of the study highlight EPU as an additional procyclical factor to influence bank LLPs and adds to a growing literature by showing that policy uncertainty may lead to the accumulation of bank accruals (Ng et al., 2020; Beatty & Liao, 2011). Such procyclical provision behavior of banks intensifies the economic shocks and leads to misallocation of lending resources. Therefore, policymakers need to be careful about any generated uncertainties when setting policies because this has crucial implications for banks' loan loss provisioning and credit levels. Regulatory bodies and governments should behave more transparently while developing economic policies and create a predictable and more stable economic policies (Gozgor et al., 2019).

We observed that banks tend to use more provisions discretionarily to smooth their income levels as a response to such uncertainty which is mainly observed for private US banks as opposed to listed banks Therefore, regulatory bodies could impose additional accounting discipline and supervisory standards to private banks to limit their discretionary behavior during times of high policy

[8] The results are not presented but available upon request.

uncertainty, because the procyclicality of LLPs is magnified due to such behavior, leading to further tightened lending conditions. Since banks play a very important intermediary role in providing credit to the domestic economy, any provisions more than necessary due to such uncertainty can deteriorate bank credit levels and can have severe impacts on economic growth.

The findings in this paper apply to the US context and cannot be generalized to other countries; therefore, future studies can extend the research question to other countries especially to emerging economies that experience higher levels of economic policy uncertainties. In this way, a comparison of bank loan loss provision behavior between countries can be performed. Besides, future research could include ownership types (i.e. state, domestic, foreign ownership) in the analysis and investigate whether the results would differ for these different ownership types. Moreover, alternative uncertainty measures such as geopolitical risks can be used and the studies can examine which uncertainty measures matter more for LLP behavior of banks.

CRediT authorship contribution statement

Gamze Ozturk Danisman: Data curation, Methodology, Formal analysis. **Ender Demir:** Conceptualization, Writing - original draft, Visualization. **Peterson Ozili:** Conceptualization, Writing - review & editing.

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