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# Are bank capital requirements optimally set?

## Evidence from researchers' views

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*29 April 2020*

### Abstract

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We survey 149 leading academic researchers on bank capital regulation. The median (average) respondent prefers a 10% (15%) minimum non-risk-weighted equity-to-assets ratio, which is considerably higher than the current requirement. North Americans prefer a significantly higher equity-to-assets ratio than Europeans. We find substantial support for the new forms of regulation introduced in Basel III, such as liquidity requirements. Views are most dispersed regarding the use of hybrid assets and bail-inable debt in capital regulation. 70% of experts would support an additional market-based capital requirement. When investigating factors driving capital requirement preferences, we find that the typical expert believes a five percentage points increase in capital requirements would “probably decrease” both the likelihood and social cost of a crisis with “minimal to no change” to loan volumes and economic activity. The best predictor of capital requirement preference is how strongly an expert believes that higher capital requirements would increase the cost of bank lending.

JEL Codes: G01, G28

Keywords: Bank regulation, capital requirements, expert survey

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## I. Introduction

The literature on bank regulation has made much progress in the aftermath of the Global Financial Crisis of 2007-2009.<sup>1</sup> However, many of the key questions, including the optimal level of bank capital, are still open as results from theoretical and empirical studies vary greatly. Further, there have since been a number of notable initiatives from researchers to fundamentally change bank capital regulation (see e.g. Admati and Hellwig 2013) but it is unclear how commonly these views are shared within the academic community. At this juncture, it has become important to draw together results from the literature and form a balanced view of them. What have we learned regarding the current state of bank capital regulation? Which issues in bank capital regulation enjoy relatively strong consensus vis-à-vis those subject to considerable disagreement? How should these research results translate into actual regulation?

In this paper we survey leading academic researchers in banking and finance and macro-finance on their views on bank capital regulations to address these questions. Although surveys of the literature have been recently conducted (cf. Dagher et al., 2016; BCBS, 2019), this is the first time to the best of our knowledge that academic experts exclusively have been directly surveyed on bank regulation.<sup>2</sup> We invited 1,383 academic experts to participate in the survey in the first quarter of 2019, of which 149 responded, translating to a response rate of approximately 11%.<sup>3</sup>

The results support the current overall regulatory design but are stricter regarding the level of banks' minimum capital requirements, particularly the non-risk-weighted equity-to-assets ratio (i.e., the "leverage ratio" requirement).<sup>4</sup> According to the average response, banks should have approximately

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<sup>1</sup> See e.g. Kashyap et al. (2011), Admati and Hellwig (2013), and Freixas et al. (2015) for overviews of the literature.

<sup>2</sup> Welch (2000) is a prior example of surveying academic financial economists (on the equity premium expectations in his case) and the number of responses he received (226) is also broadly comparable with ours. Choi and Robertson (2019) is a recent example of a study in financial economics based only on survey results.

<sup>3</sup> Such a response rate appears to be quite standard in similar settings; see e.g. Graham and Harvey (2001).

<sup>4</sup> The starting point of the Basel III recommendation is 3%. Basel III uses a specific definition for the non-risk-weighted leverage ratio which also includes off-balance sheet items in the denominator and is hence not directly comparable with the ratio we asked about in the survey. Note that in the Basel terminology, the leverage ratio means an equity-to-assets type of ratio, not its inverse.

a minimum of 15% of common equity in relation to their total assets at all times. The median response is somewhat lower, 10%. There is a considerable skew in the distribution of responses to even higher ratios. Moreover, there is a statistically significant difference between North-American respondents who on average prefer an 18% minimum equity-to-assets ratio and Europeans who on average prefer 13%. We explore potential explanations to this difference such as Europe's more banking-oriented financial system, and accounting differences between the two jurisdictions. The response distribution concerning the risk-weighted minimum capital requirement is broadly similar (see Figure 1), and the average response is remarkably close to that for the leverage ratio requirement.

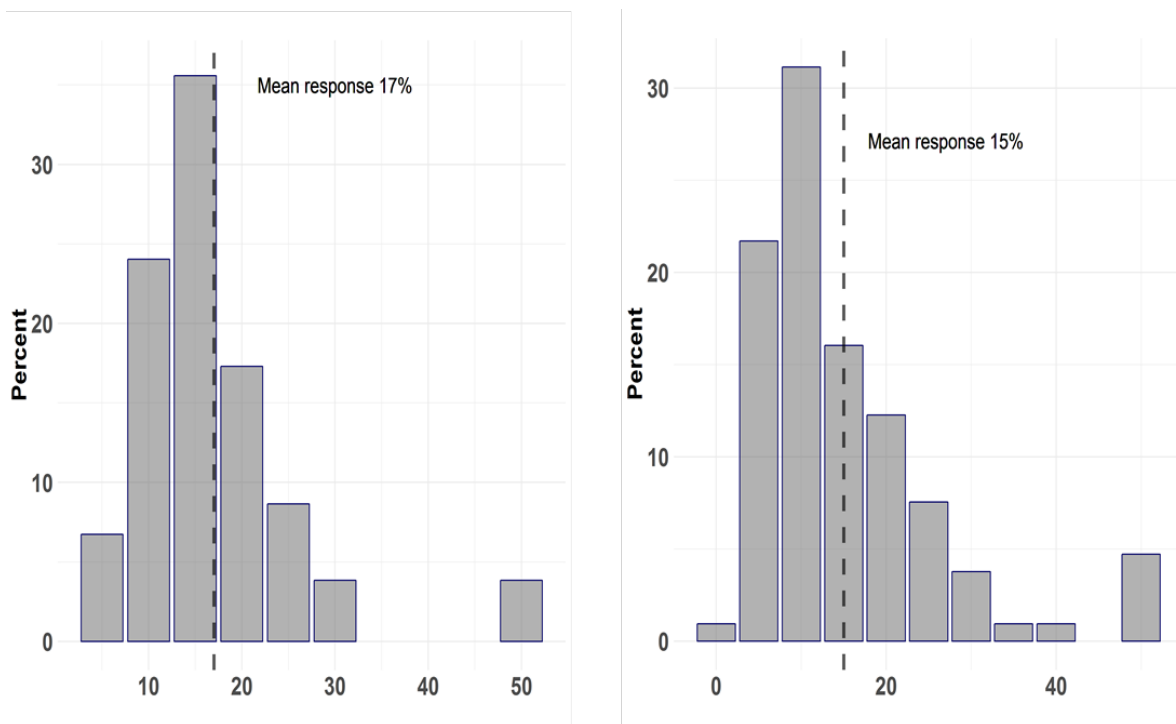


Figure 1. Distributions of the preferred minimum capital requirements; common equity to risk-weighted assets (left panel) and common equity to total assets, i.e., the leverage ratio requirement (right panel)

Respondents were asked to answer the following questions, part a) referring to the leverage ratio requirement and part b) to the risk-weighted requirement: “What approximate values of the following capital ratios (in terms of book value equity and in percent) is closest to your view of the level of capital that all banks should have as a minimum at all times: a) common equity to total assets b) common equity to risk-weighted assets? Possible values for the responses were limited to the range from 0% to 50% in 5 percentage points increments (e.g. 0%,5%,10%,15%...). The highest possible response value of 50% means 50% or higher. Mean responses in the figures are rounded to the closest integer.

Second, the majority of respondents approves of the new elements in banking regulation introduced in the Basel III reform after the Global Financial Crisis. In addition to the leverage ratio requirement, clear approval was given to an extra capital charge on the largest, systemically important banks, a counter-cyclical component to capital requirements, and additional liquidity requirements. Somewhat weaker, yet clear approval was given also to the eligibility of hybrid and bail-inable securities in fulfilling the minimum capital requirements. The consensus was strongest regarding the surcharge for systemically important banks and weakest regarding the use of hybrid and bail-inable securities. Furthermore, most respondents would favor an additional market-based capital requirement to complement the current book value-based capital requirements on banks.

Third, respondents generally believe that higher capital requirements would probably decrease both the likelihood and the social cost of banking crises while causing minimal decline, if any, to the level of economic activity. Regarding the impact on provision of lending, responses were more divided between minimal change and a probable decrease.

Taken together with the average respondent's preference for higher capital requirements, these results suggest the following interpretation of the trade-off that determines the optimal level of bank capital: more bank capital (than required by the Basel rules) would further reduce the likelihood and the social cost of banking crisis with only small if any decline in economic activity. Therefore a higher than the current level of bank capital requirements would be closer to the optimum.

We document how these views differ across respondents based on their self-rated expertise, years of experience in different fields, and region of residence. We also regress respondents' views on minimum capital requirements, other components of bank regulation, and the current and future state of the financial system on their perceptions of effects of (higher) capital requirements. We find that a respondent's view on the effect of capital requirements on the cost of bank lending is the most robust predictor of her preferred level of minimum capital requirements.

The paper is structured as follows. In Section II we provide further motivation for a survey approach to study optimal bank capital requirements and introduce the survey design and implementation. Section III provides an overview of the key results concerning preferred capital requirements. Next, the relation of bank capital requirement preferences to respondents' background characteristics (Section IV) and to their perceived effects of capital requirements (Section V) are analyzed. Section VI analyzes consistency of the responses and Section VII compares the results with earlier literature. The final section concludes.

## II. Survey description

We motivate the survey approach to studying bank capital requirements from several perspectives. First, a survey of academic experts who can be expected to be familiar with the literature but may also draw different conclusions from it, using their expert judgment, provides a complementary way of drawing together results from the literature and forming a balanced view of them. A survey can also complement an aggregated view obtained from a meta-analysis of the literature (cf. e.g. Boissay et al., 2019; Fidrmuc and Lind, 2018). Moreover, the distribution of responses to specific questions provides information of what are the issues of bank regulation of which there is relatively high consensus vs disagreement. This may help guide the choice of future research questions.

Second, many of the economic mechanisms that determine the optimal level of bank capital requirements are subject to major modelling challenges. The optimum essentially depends on the trade-off between reducing the likelihood and social costs of banking crises while possibly reducing credit and hence short-term economic growth (cf. e.g. Aikman et al 2018). Ideally, this question should probably be studied in a sufficiently realistic macroeconomic model which incorporates the possibility of a large-scale banking crisis with potentially prolonged economic consequences, the mechanisms of how banks and bank lending contribute to economic growth, and how both of these are affected by bank capital structure. Although important steps have been taken in the recent literature, macroeconomic models are still struggling with incorporating many central aspects such

as highly nonlinear effects of crises and their possibly protracted aftermaths as well as the choice of appropriate welfare criteria. Therefore, a survey of experts on the key question of optimal level of bank capital requirements provides judgement-based information that is supplemental to the current generation of formal models.

In order to make the survey as comprehensive as possible and to maximize the number of responses, it was designed and implemented in the following way. A balance has to be struck between the number and the level of detail of questions in order to avoid overburdening respondents, which might lead to a lower response rate. The survey questionnaire was pre-tested on a limited sub-group of experts and was designed under the guidance of an Advisory Board.<sup>5</sup> The resulting questionnaire consisted of 18 question groups which could be completed in about 5–15 minutes.

The survey questionnaire focuses on three key aspects. Firstly, the effects of bank capital requirements; secondly, how much capital banks should have at the minimum; and thirdly, the design of regulatory requirements. We ask about the background factors of respondents such as gender, region of residence, and areas of expertise. We also include questions regarding general views of the current state of bank regulation and resilience of the financial system. Table 1 provides a summary of the questions by category. The full set of questions and response distributions are available online.<sup>6</sup> Given that bank capital regulation is a multi-dimensional issue and deeply interconnected with other aspects of banking regulation, the survey was designed to take the various aspects into account while striving to maintain clarity and sufficient simplicity.

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<sup>5</sup> See Acknowledgements.

<sup>6</sup> See: [https://www.suomenpankki.fi/globalassets/en/research/bank-capital-survey/bofbankcapitalsurvey\\_report.pdf](https://www.suomenpankki.fi/globalassets/en/research/bank-capital-survey/bofbankcapitalsurvey_report.pdf)

Table 1. Survey responses summary

	Question	Modal Answer	No. of categories <sup>a</sup>	Dispersion index <sup>b</sup>	Obs.
<b>Demographic</b>	Region	Europe	3	0.160	149
	Gender	Male	2	0.581	143
<b>Expertise</b>	Self-rating on banking regulation	Expert	4	0.170	148
	Main Field	Banking and Finance	3	0.177	147
	Academic experience (years)	10	11	0.030	144
	Priv. Sector experience (years)	5	11	0.257	73
	Pub. Sector experience (years)	5	11	0.106	90
<b>Minimum capital requirements</b>	Answer option	I will give values for book equity to risk-weighted assets AND leverage ratio	3	0.099	140
	Leverage ratio	10	11	0.114	106
	Equity to risk-weighted assets	15	11	0.152	104
<b>Effect of higher requirements</b>	Average cost of capital to the bank	Probably increase	5	0.251	14
	Loan volumes	Minimal to no change	5	0.209	144
	Cost of bank lending	Probably increase	5	0.304	148
	Economic activity	Minimal to no change	5	0.343	146
	Likelihood of crisis	Probably decrease	5	0.238	147
	Social losses in crisis	Probably decrease	5	0.236	145
<b>Mode of regulation</b>	Leverage ratio	Yes and would complement risk-weighted capital requirements	3	0.387	146
	Additional G-SIB requirements	Yes	2	0.547	146
	Counter-cyclical buffer	Yes	2	0.261	143
	Use of hybrid instruments	Yes	2	0.050	134
	Market-based measures of capital	Yes and would complement book-/accounting-based capital requirements	3	0.143	146
	Liquidity coverage ratio	Yes and a complement to capital requirements	3	0.534	138
	Net stable funding ratio	Yes and a complement to capital requirements	3	0.423	127
<b>General views</b>	On strictness of Basel III	Somewhat strict	4	0.167	13
	On strictness of own views relative to peers	Somewhat strict	4	0.528	133
	Improved resilience of financial system relative to the past	Yes	4	0.237	148
	Improved resilience of financial system going forward	No, about the same	4	0.144	143
	Likelihood of crisis over next 5 years	Unlikely	4	0.273	144

<sup>a</sup>No. of categories is the number of possible answer options excluding “No Opinion.”

<sup>b</sup>Dispersion index is a standardized Simpson/Herfindahl-Hirschman Index defined as  $(HHI - 1/N)/(1 - 1/N)$  where N is the number of categories.

We address the survey to experts primarily from the academe. This is motivated by political economy considerations in reaching agreements on bank capital requirements and in the assessment of the current state of bank regulation. Even if bank regulators are well-informed of research-based evidence, the actual agreements on bank regulations may well be affected by the interests of various stakeholders such as the banking industry. Therefore, when the research question focuses on the optimal design and level of bank capital requirements vis-à-vis the actual requirements, surveying academic experts that are arguably the most impartial group of experts on the issue is informative. In the survey we ask about the respondents' experience (in years) in the academia as well as in the private and the public sector, which partly allows us to assess the neutrality of their views.

The selection of respondents is intended to reach as many as possible of the leading academic researchers and experts on issues of bank capital regulation. What we mean by experts in the current context are not only academics who have contributed to research on bank capital regulation but who can be expected to have been exposed to that research or are known to have an interest in this area.

The selection took place in two phases. First, an algorithm was used to search researchers from IDEAS/RePEc, using relevant fields of specialization and the author ranking. Specifically, the "raw list" includes the top 10 % authors in thirteen fields and comprises 932 names.<sup>7</sup> Second, the raw list was manually checked for possible omissions as some researchers may not have an IDEAS/RePEc account.<sup>8</sup> When adding names, the researcher's general standing in the field was also taken into account. The final list at the launch comprised of 1,045 names. Moreover, we added 338 respondents in connection with the first reminder. These were collected with a similar two-stage procedure. However, this time the first stage was conducted by searching the editorial boards of the leading journals that publish banking, bank regulation or macroprudential analysis related research for

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<sup>7</sup> <https://ideas.repec.org/> The fields included in the search are accounting and auditing, central banking, corporate finance, finance, financial markets, macro, banking, regulation, monetary economics, risk management, micro finance, open macroeconomics, and dynamic general equilibrium.

<sup>8</sup> We removed names of deceased and those for whom we could not find a valid email address.

academics that were not included in the original list. The additional invitations were sent in order to secure a sufficient number of responses after the flow of responses between the launch and first reminder was observed.

Overall, we do not claim to have collected an exhaustive list of relevant researchers but believe that the final list is representative of the leading researchers in fields relevant to the subject matter.

The survey was conducted anonymously in order to facilitate truth-telling and raise the likelihood of participation as providing full anonymity eliminates any reputational risks that participation might otherwise bring about. The invited respondents or those who responded are not revealed and the latter are not identifiable to the authors either. To ensure that ex post identification is not possible either, at least a certain minimum number of invitations was sent to each combination of background groups such as gender and region. The trade-off from anonymity is that it precludes the use of any other information than what is asked in the survey questionnaire.

The survey was launched online on 14 February 2019, and concluded on 10 March 2019. We sent invitations to 1,383 academic researchers and 149 of them replied. The first “wave” of 1,045 experts were invited to participate in the survey on 14 February 2019. Reminders were sent on 25 February and 8 March. The additional 338 experts were invited on 25 February and were also sent a reminder on 8 March.

Finally, we note that in addition to their benefits, surveys are subject to problems of their own as a research method. As Graham and Harvey (2001) point out, a survey measures beliefs, not actions. It is possible that if faced with a real decision-making problem and all the real world uncertainties, an academic expert might come to a different conclusion concerning, for instance, the desirable level of bank capital. On the other hand, as we have emphasized earlier, as an independent expert she may be less exposed to influences from various stakeholders.

### III. Preferred bank capital regulation: overview of the results

In this section we present the basic results concerning views on bank capital requirements and other forms of bank regulation. Table 1 provides a brief summary of the results by providing the modal answer and a dispersion index measure for each question.

Our key results concern the desired level of bank capital requirements. As a separate question, we first ask if the respondent wants to give a number to both the minimum non-risk-weighted capital requirement (henceforth, the leverage ratio requirement) and the risk-weighted minimum capital requirement or only one of them. We find that only 50% wanted to give a number for both, although, as we discuss in more detail below, more than 70% prefer to have both the leverage ratio requirement and the risk-weighted capital requirement as part of bank capital regulation. This discrepancy may suggest that many respondents find it challenging to calibrate the two different types of capital requirements at the same time, perhaps given the many trade-offs their simultaneous use involves but which are difficult to quantify.<sup>9</sup>

Figure 1 provides the entire response distribution for both the minimum leverage ratio requirement and the risk-weighted minimum capital requirement. According to the average response, all banks should have a minimum of (approximately) 15% of common equity in relation to their total assets at all times. The median response is 10%. There is a considerable skew in the distribution of responses to higher ratios.

Note that in the two questions concerning the preferred level of the risk-weighted capital requirement and the leverage ratio requirement, respectively, the response options run from zero to 50% with five percentage point intervals, i.e., 0%, 5%, 10%,..., 50%. The respondents are asked to give the

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<sup>9</sup> For instance, Duffie (2017) argues that the leverage ratio requirement may have been detrimental to liquidity in some markets. Blum (2008) shows that adding a leverage ratio requirement can promote truthful risk reporting by banks. Kiema and Jokivuolle (2014) analyze implications for banks' portfolio risk under simultaneous risk-weighted and non-risk-weighted capital requirements.

“approximate value of the... capital ratio(s) (that) is closest to (her/his) view”. Hence the median answer must be one of the response options. Moreover, the 50% option is defined as “50% and over” which explains why we observe a response “peak” at the 50% level. Note that this also induces a potential downward bias in the average numbers. After collecting comments from the test respondents, we chose this response scale for simplicity and to facilitate answering.

Overall, even though the Basel III framework’s definition of leverage ratio is more complex than ours (see footnote 4), our results suggest that the respondents have a preference for a considerably higher regulatory minimum capital requirement for constraining bank leverage than the original recommendation of 3% in Basel III.

For the risk-weighted capital requirement, the mean response is 17% and the median is 15% of common equity per risk-weighted assets. These average views are considerably higher than the Basel recommendation for all banks.<sup>10</sup> It is interesting that the average respondent’s choice of the leverage ratio (15%) and the risk-weighted capital requirement (17%) are so close to one another. When we consider the difference between the two choices per respondent who gave answers to both, the average difference grows larger but is still relatively small. This result contrasts with the current Basel III recommendations where the difference between the minimum risk-weighted capital requirement and the minimum leverage ratio requirement is generally quite large, the risk-weighted requirement being much higher in relative terms. Although our results do not indicate a wide-spread preference for replacing risk-weighted capital requirements, one possible interpretation is that respondents are concerned about issues such as errors in risk estimation (see e.g. Berg and Koziol 2017) and banks’ incentives to manipulate risk weights (see e.g. Mariathasan and Merrouche 2014) to the extent that

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<sup>10</sup> However, they are more in line with the Financial Stability Boards’ minimum standard of 18% for the Total Loss-Absorbing Capacity (which includes also bail-inable debt) of global systemically important banks, to be phased-in by 2022; see e.g. Aikman et al. 2018.

they place much emphasis on the role of the leverage ratio requirement to serve as a backstop in safeguarding bank solvency.

We next discuss respondents' general views concerning desirability of the new forms of regulation introduced in the Basel III reform. As already discussed, a clear majority (more than 70%) prefers to have the leverage ratio requirement as a complement to risk-weighted capital requirements. Approximately 15% of respondents would prefer the leverage ratio requirement to replace the risk-weighted capital requirement, and nearly 10% would only have the risk-weighted requirement. Those who would like to have the leverage ratio requirement only, would on average set it at 22%. Those who prefer to have both requirements would set the minimum leverage ratio at 13%. The difference between these two averages is statistically significant at 1% level.

Roughly 60% to 80% of the respondents support also the other new components of bank regulation introduced in the Basel III reform, namely the extra capital requirement on systemically important banks (over 80% support), a dynamic (i.e., counter-cyclical) component to capital requirements (ca. 70% support), and the two liquidity related requirements; the Liquidity Coverage Ratio (over 70% support) and the Net Stable Funding Ratio (over 60% support), as complementary tools. Secondly, almost 60% of the respondents support the use of hybrid or bail-inable securities to meet capital requirements. However, there is a sizeable minority of more than 35% who oppose their use.<sup>11</sup>

Interestingly, we find that almost 60% would support the inclusion of market-based measures of capital to complement the accounting-based capital requirements. Roughly 15% think they should

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<sup>11</sup> Studies such as Flannery (2009) have argued that because many hybrid instruments have a tax advantage over equity thanks to their debt-like features, they may be used in bank capital requirements in order to reduce banks incentives to engage in regulatory arbitrage. In accordance with this argument, we find that those respondents who do support the use of hybrid and bail-inable instruments are also more likely to think that higher (common equity) capital requirements raise the weighted-average cost of bank capital.

even replace the accounting-based requirements. Almost 30% of the respondents oppose their use, though, given the accounting-based requirements.<sup>12</sup>

We also combine the “for” and “against” views into “net approval ratings” by taking the difference between their shares (see Table 2). The leverage ratio obtains the highest net approval (79%) while the use of hybrid instruments obtains the lowest (20%). There are some interesting differences across different subgroups of respondents. For instance, European respondents and those who assess themselves to be “experts” (as opposed to “knowledgeable” or “aware”) on the issues surveyed, give over 90% net approval rating to the leverage ratio requirement. American respondents are even less supportive of the use of hybrid and bail-in instruments in meeting capital requirements (12% net approval) than Europeans (28% net approval).

Table 2. Net approval ratings for various modes of regulation

	Leverage ratio	Additional G-SIB requirements	Liquidity coverage ratio	Net stable funding ratio	Counter-cyclical buffer	Market-based measures of capital	Use of hybrid instruments
<b>Self rating</b>							
Expert	91 %	72 %	55 %	33 %	52 %	31 %	23 %
Knowledgeable	77 %	85 %	63 %	48 %	57 %	50 %	19 %
Aware	54 %	42 %	71 %	42 %	29 %	46 %	13 %
<b>Region</b>							
Europe	92 %	81 %	75 %	46 %	65 %	35 %	28 %
North America	69 %	66 %	48 %	33 %	30 %	40 %	12 %
Other	60 %	60 %	50 %	60 %	60 %	80 %	22 %
<b>Total</b>	79 %	72 %	61 %	41 %	49 %	40 %	20 %

These are net percentages calculated as percentage of respondents saying “yes” minus percentage of respondents saying “no”. Survey questions are framed in the following way: Should/Is there a need for \_\_\_\_\_ form/as part of banking regulation? In questions concerning the leverage ratio requirement, market-based requirement, and the liquidity requirements, there are two options for “yes” answers, which are pooled together when calculating the net approval ratings.

<sup>12</sup> We asked about a market-based capital requirement partly motivated by findings that market-based capital ratios predicted problem banks in the Global Financial Crisis better than accounting based capital ratios (see Haldane 2011).

As a final note concerning the basic results, it is possible that our sample of respondents suffers from a selection bias in the sense that respondents who have more extreme views regarding bank capital regulation are more likely to answer. We can partly control for this with the survey question that asked how the respondent thinks his or her own views regarding the Basel III standards compare to his or her peers in terms of strictness. We find that, indeed, the number of respondents who think their own views are stricter than those of their peers' is larger than the number of those who think their views are more lenient. Using this information we estimate that a hypothetical respondent who views the Basel III standards as neither too strict nor too lenient would prefer a minimum risk-weighted and leverage ratio requirement of 16.75 and 14.62, respectively.<sup>13</sup> However, such "corrections" to the average survey answers, 16.78 and 15.14, respectively, would be quite small; about half a percentage point in case of the leverage ratio requirement.

#### IV. How background factors correlate with preferences regarding bank capital regulations?

In this section we analyze whether respondents' background factors can help explain their preferences regarding capital requirements. For instance, as the share of bank-based finance is larger in the European Union than in the United States, there could be differences in responses by European and North American residents. Further, a respondent's experience and expertise in the field of banking regulation together with the general area of her research focus (i.e. Macro-Finance relative to Banking and Finance) may shape her perspective on banking regulation.

Table 3 shows a breakdown of responses by demographic characteristics. Most respondents, 93%, currently reside in either North America or Europe. Only 11% of respondents are female. Roughly 40% of respondents identify themselves as experts while the rest consider themselves either "knowledgeable" or "aware" of issues in banking regulation. There are somewhat more respondents who specialize in banking and finance (54%) relative to those who identify themselves with macro-

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<sup>13</sup> Estimation details are available from the authors upon request.

finance (38%). About 60% of respondents have some experience in the public sector while roughly half have some experience in the private sector. Virtually everyone (97%) has experience from the academe, and the great majority has a 15-35 year experience, with a fairly uniform distribution within that range (see Ambrocio et al. 2019, figure 2).

Table 3. Breakdown of respondents by demographics

Invited			Gender			Region		
	No response	Response	Female	Male	No answer	North America	Europe	Other
<b>Obs.</b>	1234	149	17	126	6	67	72	10
<b>Share (%)</b>	89	11	11	85	4	45	48	7
Self-assessment			Field			Experience <sup>b</sup>		
	Expert	Non-expert <sup>a</sup>	Macro-Finance	Banking and Finance	Other	Academia	Public	Private
<b>Obs.</b>	64	85	57	80	12	144	90	73
<b>Share (%)</b>	43	57	38	54	8	97	60	49

<sup>a</sup>Respondents who are unaware, aware or knowledgeable on issues related to bank capital requirements are labelled as non-experts.

<sup>b</sup>Each respondent with at least one year of experience in a given sector is counted in the respected experience group.

Table 4 gives a breakdown of the average and median preference for the leverage ratio requirement and risk-weighted capital requirement by groups. Regarding gender, contrary to the hypothesis that female respondents are more risk-averse and may hence prefer higher capital ratios, there is not much difference in the average or median views across gender groups and female respondents even prefer somewhat lower capital ratios than male respondents.<sup>14</sup> The only difference that appears robust is that North-American respondents prefer a higher minimum leverage ratio requirement than Europeans.

To study this further, Tables 5 and 6 report regressions on the choices of minimum capital ratios on demographic characteristics. Table 5 confirms that respondents residing in North America have a preference for about 5 percentage point higher minimum leverage ratio requirement. On average, North-American respondents prefer an 18% minimum leverage ratio requirement while Europeans

<sup>14</sup> Adams and Ragunathan (2017) argue that although there is population level evidence of women being more risk averse than men, occupational selection to certain industries may reverse that.

Table 4. Preferred minimum capital ratio preferences by groups

		Leverage ratio requirement (%)		Risk-weighted requirement (%)	
Group	Subgroup	Mean	Median	Mean	Median
Gender	Female	13.8	10	13.3	15
	Male	14.9	10	16.9	15
Region	North America	17.6	15	18.3	15
	Europe	12.6	10	15.8	15
Field	Banking and finance	14.0	10	16.8	15
	Macro-finance	16.7	15	17.0	15
Self-assessment	Expert	14.4	10	18.3	15
	Knowledgeable	15.8	15	15.9	15
	Aware	17.1	15	15.6	15

Respondents were asked to answer the following questions, part a) referring to the leverage ratio requirement and part b) to the risk-weighted requirement: What approximate values of the following capital ratios (in terms of book value equity and in percent) is closest to your view of the level of capital that all banks should have as a minimum at all times: a) common equity to total assets b) common equity to risk-weighted assets? Possible values for the responses were limited to the range from 0% to 50% in 5 percentage points increments (e.g. 0%,5%,10%,15%...). The highest possible response value of 50% means 50% or higher.

prefer 13%. The difference is statistically significant both in the univariate and multivariate regressions (columns 1, 8 and 10 in Table 5). It turns out that the European-North American difference is robust also with respect to adding views on the perceived effects of capital requirements as explanatory variables (see Section V).

One potential explanation to this difference could be that because the US financial market is less bank-oriented, US-based respondents might think that the potentially negative effect on bank lending and hence economic activity of higher capital requirements is weaker in relation to what their European counterparts think.<sup>15</sup> However, we find the opposite: the US-based respondents indicate there is a stronger negative link between capital requirements and bank lending than the Europeans.<sup>16</sup>

<sup>15</sup> We asked respondents to assess the effect of (higher) capital requirements on bank lending generally, not specifically in their own jurisdiction.

<sup>16</sup> The results are available from the authors upon request.

Table 5. Regression of the preferred leverage ratio requirement on demographic factors

Dependent variable: Preferred minimum leverage ratio requirement										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
North America	4.957** (2.160)							4.635** (2.252)		4.650** (2.280)
Male		1.194 (3.202)						1.103 (3.523)		0.21 (3.654)
Banking and Finance			-2.715 (2.294)					-3.101 (2.483)		-2.872 (2.516)
Expert				-1.415 (2.127)				-0.969 (2.457)		-1.069 (2.784)
Academic exp. (years)					0.211** (0.081)				0.186* (0.100)	0.128 (0.113)
Private exp. (years)						0.111 (0.158)			0.001 (0.162)	0.023 (0.170)
Public exp. (years)							-0.218* (0.124)		-0.07 (0.145)	-0.052 (0.169)
Constant	12.596*** (1.488)	13.750*** (3.005)	16.667*** (1.825)	14.434*** (1.504)	10.566*** (2.044)	14.797*** (1.172)	16.685*** (1.369)	13.111*** (3.841)	11.603*** (2.968)	11.209*** (5.029)
Observations	99	101	98	106	106	106	106	89	106	89
R-squared	0.052	0.001	0.014	0.004	0.061	0.005	0.029	0.075	0.063	0.109
Adj. R-squared	0.042	-0.009	0.004	-0.005	0.052	-0.005	0.02	0.031	0.035	0.032

\*P<0.1; \*\*P<0.05; \*\*\*P<0.01.

The first four explanatory variables (North America, Male, Banking and Finance, Expert) are dummy variables taking value one if the respondent belongs to the respective demographic group. The last three explanatory variables (Academic experience, Private sector experience, Public sector experience) are in years.

Another potential explanation is that accounting differences in the EU and the US concerning netting rules make the reported US leverage ratios effectively lower than the European ones. In effect, the same leverage ratio requirement in both jurisdictions would be more lenient for the US banks (see Wall 2017). To target the same level of restricting bank leverage, US-based respondents (as arguably the dominant subgroup within North American respondents) would hence prefer a seemingly higher leverage ratio requirement than European respondents.

Interestingly, we find with the univariate models in Table 5 that an additional 10 years of academic experience is associated with about 2%-points higher preference for the minimum leverage ratio requirement. This would amount to a considerable difference in views between young academics in

Table 6. Regression of the preferred risk-weighted capital requirement on demographic factors

Dependent variable: Preferred minimum risk-weighted capital requirement										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
North America	2.53 (1.837)							1.698 (1.853)		1.678 (1.888)
Male		3.598 (2.580)						4.411 (2.785)		4.44 (2.842)
Banking and Finance			-0.158 (1.866)					-1.429 (2.019)		-1.24 (2.093)
Expert				2.518 (1.762)				2.548 (2.031)		2.468 (2.216)
Academic exp. (years)					0.063 (0.074)				0.059 (0.084)	0.056 (0.094)
Private exp. (years)						0.047 (0.149)			0.022 (0.159)	-0.015 (0.193)
Public exp. (years)							-0.03 (0.094)		-0.006 (0.105)	0.014 (0.132)
Constant	15.804*** (1.202)	13.333*** (2.420)	17.000*** (1.430)	18.256*** (1.349)	15.498*** (1.747)	16.656*** (0.957)	17.005*** (1.135)	14.478*** (3.318)	15.565*** (2.243)	13.089*** (4.619)
Observations	98	100	97	104	104	104	104	89	104	89
R-squared	0.019	0.019	0.0001	0.02	0.007	0.001	0.001	0.052	0.007	0.057
Adj. R-squared	0.009	0.009	-0.01	0.01	-0.003	-0.009	-0.009	0.007	-0.023	-0.024

\*P<0.1; \*\*P<0.05; \*\*\*P<0.01

The first four explanatory variables (North America, Male, Banking and Finance, Expert) are dummy variables taking value one if the respondent belongs to the respective demographic group. The last three explanatory variables (Academic experience, Private sector experience, Public sector experience) are in years.

the beginning of their research career and those close to retirement. Recall, though, that academic experience in years, which also serves as the best proxy for respondent age in our data, is fairly uniformly distributed so the sample average response should not be dominated by any specific age group of respondents. In contrast to the effect of academic experience, an additional 10 years of public sector experience is associated with about 2%-points lower minimum leverage ratio requirements. However, note that these findings are not very robust as in the multivariate model (see column 10 in Table 5) we find no statistically significant relationships between these demographic characteristics and preferences for the leverage ratio requirement.

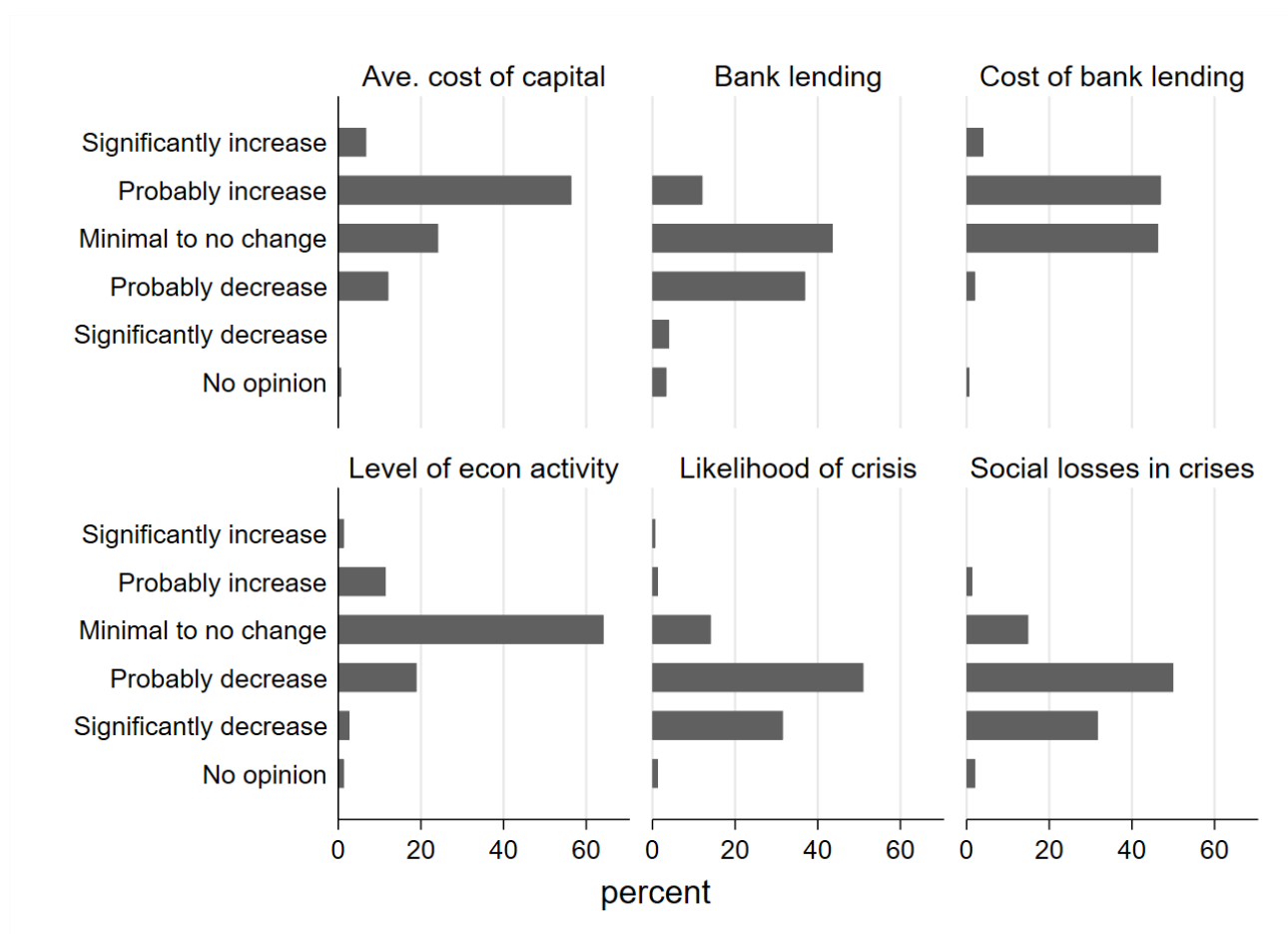


Figure 2. Breakdown of responses regarding the effects of higher capital requirements

Respondents answered the following questions: How are the following likely to be different (in the steady state) if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations: i) the weighted average cost of capital to the bank (upper left panel), ii) the provision of bank lending (upper middle panel), iii) the cost of bank lending (upper right panel), iv) the level of economic activity (lower left panel), v) the likelihood of banking crises (lower middle panel), and vi) the social losses incurred in the event of a banking crises?

In contrast to preferences regarding the leverage ratio requirement, none of the background factors explains respondents' preferences regarding the risk-weighted capital requirement (see Table 6).

#### V. Preferences relative to perceived effects of capital requirements

We now turn to respondents' views on the effects that increased capital requirements would have and how these views relate to their preferences regarding minimum capital requirements. Figure 2 provides a breakdown of responses to the questions on the effects of higher capital requirements. Each of these questions takes the following form: "How are the following (outcomes) likely to be

different in the steady state if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations?” The outcomes asked about are “likelihood of crises”, “social cost of crises”, “provision of bank lending”, “cost of bank lending”, “economic activity”, and “weighted-average cost of bank capital”.

In order to aggregate the views on these effects and facilitate their comparison, in Table 7 we quantify the response options into a scale -1, -0.5, 0, 0.5, 1 where “-1/-0.5” represent the response options *Significantly/Probably decrease* and “1/0.5” represent *Significantly/Probably increase*. The response option *Minimal to no change* is assigned “0”.

According to the means of the quantified responses, a five percentage point increase in capital requirements leads (approximately) to a probable decrease in the likelihood of a crisis (mean response is -0.56) and social losses incurred during a crisis (mean -0.57), minimal to no change in the provision of bank lending (mean -0.17) and the level of economic activity (mean -0.05), and a probable increase in the cost of bank lending (mean 0.27) and the weighted-average cost of capital to banks (mean 0.29). Interestingly, as Table 7 shows, the average responses of European and North-American residents are quite similar.

These findings suggest the following interpretation of our results. The average respondent prefers a relatively high capital requirement for banks (relative to the current regulatory standards) because she believes that marginal benefits of increased requirements would outweigh their marginal costs. In particular, she believes that higher requirements would probably decrease the likelihood and social costs of a crisis while having a minimal to no impact to the level of economic activity. Although she believes that the higher requirements would probably somewhat increase the weighted-average cost

of bank capital and (hence) the cost of bank lending, there would only be a minimal to no change in the provision of bank lending (and hence economic activity).<sup>17</sup>

Table 7. Quantified mean responses regarding the long run effects of increased capital requirements

	Group	Mean	SD	Obs.
Likelihood of crisis	Total	-0.56	0.38	147
	Europe	-0.56	0.41	72
	North America	-0.57	0.35	65
Social losses in crisis	Total	-0.57	0.36	145
	Europe	-0.61	0.36	71
	North America	-0.55	0.36	64
Bank lending	Total	-0.17	0.37	144
	Europe	-0.18	0.40	68
	North America	-0.17	0.35	66
Cost of bank lending	Total	0.27	0.31	148
	Europe	0.28	0.29	72
	North America	0.24	0.32	66
Level of econ activity	Total	-0.05	0.34	146
	Europe	-0.04	0.38	72
	North America	-0.05	0.30	64
Ave. Cost of capital	Total	0.29	0.40	148
	Europe	0.24	0.38	72
	North America	0.32	0.42	66

Respondents answered the following questions: How are the following likely to be different (in the steady state) if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations: the likelihood of banking crises/the social losses incurred in the event of a banking crises/the provision of bank lending/the cost of bank lending/the level of economic activity/the weighted average cost of capital to the bank? The answer options given were “significantly increase/probably increase/minimal to no change/probably decrease/significantly decrease/no opinion”. For the purpose of the analysis, we have afterwards quantified the first five answer options with values 1/0.5/0/-0.5/-1, respectively.

This interpretation gets further support from correlations between the perceived effects (see Table 8 where the “effects” variables reside in the last six columns and rows). Focusing on the “economic cost channel” of higher capital requirements, we first note that there is a positive 35% (statistically

<sup>17</sup> The structure of this trade-off to determine the optimal capital requirements for banks is broadly in line with those discussed e.g. in Aikman et al.(2018) and Dagher et al. (2016).

Table 8. Correlations between responses to a selection of survey questions

	Min RWCR	Min Lev	Crisis likely	Strictness: own	Strictness: Basel	Improved resilience	Effect: Crisis likelihood	Effect: Crisis losses	Effect: Loan volume	Effect: Lending cost	Effect: Economic activity	Effect: Bank WACC
Min RWCR	1.000											
Min Lev	0.774***	1.000										
Crisis likely	0.094	0.097	1.000									
Strictness: own	0.148	0.098	-0.001	1.000								
Strictness: Basel	-0.393***	-0.256**	-0.168*	-0.314***	1.000							
Improved resilience	-0.121	-0.295***	-0.399***	-0.028	0.283***	1.000						
Effect: Crisis likelihood	-0.119	0.135	0.261***	-0.099	0.154*	-0.256***	1.000					
Effect: Crisis losses	-0.006	0.227**	0.178**	-0.031	0.170**	-0.244***	0.648***	1.000				
Effect: Loan volume	0.229**	0.130	-0.079	0.141	-0.293***	0.027	-0.092	0.034	1.000			
Effect: Lending cost	-0.319***	-0.230**	-0.053	-0.305***	0.397***	0.044	0.165**	0.115	-0.433***	1.000		
Effect: Economic activity	0.226**	0.117	0.020	0.278***	-0.254***	0.093	-0.244***	-0.118	0.596***	-0.462***	1.000	
Effect: Bank WACC	-0.123	-0.168*	-0.148*	-0.038	0.322***	0.187**	0.174**	0.066	-0.344***	0.353***	-0.262***	1.000

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

The first two variables are the preferred minimum risk-weighted capital requirement (Min RWCR) and the preferred minimum leverage ratio requirement (Min Lev). The third variable (Crisis likely) is based on responses to the question: “How likely do you see a financial crisis with global reach occurring over the next five years?” The answer options were very likely/likely/unlikely/very unlikely/no opinion. The next two variables (Strictness: own, Strictness: Basel) are based on answers to questions: “How would you describe the overall strictness of the Basel III recommendations?” and “How would you describe the overall strictness of your views on banking regulation relative to your peers and colleagues?”, respectively. The answer options to each question were very strict/somewhat strict/somewhat lenient/very lenient/no opinion. The sixth variable (Improved resilience) is based on answers to question: “Is the current financial system better prepared for a global financial crisis than it was 10 years ago?” The answer options were yes and significantly so/yes/no, about the same/no and less prepared/no opinion. The last six variables are based on responses to the following questions: how are the following likely to be different (in the steady state) if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations: the likelihood of banking crises/the social losses incurred in the event of a banking crises/the provision of bank lending/the cost of bank lending/the level of economic activity/the weighted average cost of capital to the bank. The answer options in each question were “significantly increase/probably increase/minimal to no change/probably decrease/significantly decrease/no opinion”. From the third variable onwards, the first four answer options were afterwards quantified with values 1/0.5/-0.5/1, respectively.

significant) correlation between the perceived effect on weighted-average cost of bank capital and bank lending cost of higher capital requirements. In other words, respondents who believe that higher

capital requirements increase a bank's overall funding cost also tend to believe that this increases the cost of bank lending. Further, those who believe that higher capital requirements increase the cost of bank lending, also tend to believe that the volume of lending goes down (correlation between these is -43% and is statistically significant). Finally, there is a relatively strong positive correlation of 60% between the perceived effects on lending volume and economic activity; that is, those who expect higher capital requirements to reduce lending volume, also tend to expect a reduction in economic activity.

In sum, correlation analysis of the perceived effects is consistent with the following “causal chain”: higher capital requirements would increase banks' overall funding costs which would further feed into the cost of bank lending. This would lead to a reduction in bank lending, which would result in less economic activity. However, as already concluded, respondents on average appear to weigh more the perceived positive effects of higher capital requirements (less likely crises and lower social costs in crises) than the detrimental economic effect through this cost channel, as they on average would be ready to increase the current requirements, especially the leverage ratio requirement.

In Tables 9 and 10 we study which of the perceived effects best predict the respondents' capital requirement preferences. We find that respondents who believe that higher requirements raise the costs of bank lending tend to choose both lower leverage (Table 9, columns 4 and 7) and risk-weighted capital ratios (Table 10, columns 4 and 7). This is the only “effect” variable that is statistically significant with the expected sign both in the univariate and the multivariate models for both the leverage ratio and risk-weighted capital requirement.

Focusing on the minimum leverage ratio requirement, we also find in the univariate model (Table 9, column 6) that respondents who believe that a higher requirement raises the weighted-average cost

Table 9. Regression of the preferred leverage ratio requirement on the perceived effects of increased capital requirements

Dependent variable: Preferred minimum leverage ratio requirement							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
The likelihood of banking crises	3.878 (2.788)						2.000 (3.729)
The social losses incurred		7.082** (2.975)					6.579* (3.929)
The provision of bank lending			3.747 (2.827)				-0.055 (3.410)
The cost of bank lending				-7.903** (3.278)			-6.916* (4.023)
The level of economic activity					3.912 (3.275)		1.403 (4.371)
The weighted average cost of capital to the bank						-4.636* (2.660)	-2.761 (2.947)
Constant	17.465*** (1.976)	19.317*** (2.038)	15.817*** (1.160)	17.192*** (1.341)	15.414*** (1.084)	16.432*** (1.285)	23.014*** (2.516)
Observations	106	106	104	106	105	106	103
R-squared	0.018	0.052	0.017	0.053	0.014	0.028	0.127
Adj. R-squared	0.009	0.043	0.007	0.044	0.004	0.019	0.072

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

The explanatory variables are based on respondents' answers the following questions: How are the following likely to be different (in the steady state) if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations: the likelihood of banking crises/the social losses incurred in the event of a banking crises/the provision of bank lending/the cost of bank lending/the level of economic activity/the weighted average cost of capital to the bank? The answer options given were "significantly increase/probably increase/minimal to no change/probably decrease/significantly decrease/no opinion". For the purpose of the analysis, we have afterwards quantified the first five answer options with values 1/0.5/0/-0.5/-1, respectively.

of bank capital tend to choose lower leverage ratios. However, this result does not survive in the multivariate model.

Perhaps a puzzling result is that respondents who believe that higher capital requirements do not much reduce the social cost of crises tend to pick higher leverage ratios (see Table 9, columns 2 and 7). However, it is important to note that almost all respondents believe that higher capital requirements either decrease or strongly decrease the social cost of crises or leave them unchanged. Hence, one possible explanation is that those who think higher capital requirements are very effective in

Table 10. Regression of the preferred risk-weighted capital requirement on the perceived effects of increased capital requirements

**Dependent variable: Preferred minimum risk-weighted capital requirement**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
The likelihood of banking crises	-2.813 (2.315)						-2.552 (3.026)
The social losses incurred		-0.157 (2.481)					2.457 (3.357)
The provision of bank lending			5.661** (2.399)				2.221 (3.270)
The cost of bank lending				-9.465*** (2.783)			-7.810** (3.418)
The level of economic activity					5.767** (2.470)		1.151 (3.360)
The weighted average cost of capital to the bank						-2.731 (2.177)	0.374 (2.379)
Constant	15.088*** (1.641)	16.683*** (1.750)	17.929*** (0.996)	19.600*** (1.174)	17.140*** (0.878)	17.632*** (1.104)	19.463*** (2.239)
Observations	104	104	103	104	103	104	102
R-squared	0.014	0.00004	0.052	0.102	0.051	0.015	0.124
Adj. R-squared	0.005	-0.01	0.043	0.093	0.042	0.006	0.069

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

The explanatory variables are based on respondents' answers the following questions: How are the following likely to be different (in the steady state) if capital requirements were higher by approximately 5 percentage points across the board and relative to Basel III recommendations: the likelihood of banking crises/the social losses incurred in the event of a banking crises/the provision of bank lending/the cost of bank lending/the level of economic activity/the weighted average cost of capital to the bank? The answer options given were "significantly increase/probably increase/minimal to no change/probably decrease/significantly decrease/no opinion". For the purpose of the analysis, we have afterwards quantified the first five answer options with values 1/0.5/0/-0.5/-1, respectively.

decreasing the social cost of crises will actually find moderately higher capital requirements sufficient for achieving this goal.

Regarding the preferred minimum risk-weighted capital ratios, we find in the univariate model that respondents who believe that higher capital requirements reduce economic activity tend to choose lower minimum ratios. However, the result is not robust in the multivariate context (see Table 10, columns 5 and 7).

In sum, the most robust predictor of a respondent's choice of the level of bank capital requirements, whether it is the leverage ratio requirement or the risk-weighted capital requirement, is how strongly she believes that higher capital requirements (relative to the Basel III norm) would affect the cost of bank lending.

## VI. Consistency of expert views

The data offers several opportunities to assess the internal consistency of respondents' answers. As a first set of checks, Table 8 shows correlations between responses to the "strictness of views" questions and capital requirement preferences. We find that the strictness of a respondent's view on banking regulation relative to peers ("Strictness: Own views") is weakly positively correlated with both the respondent's preferred risk-weighted capital requirement and the leverage ratio requirement. This is consistent in that relatively stricter views are connected with higher capital requirement preferences although the correlations are not statistically significant.

Further, there is a stronger and statistically significant negative correlation between a respondent's view of the strictness of Basel III ("Strictness: Basel") and the preference for both capital requirements. In other words, if a respondent thinks that overall, the Basel III recommendations are not very strict, the respondent prefers both a higher risk-weighted capital requirement and a higher leverage ratio requirement. There is also a strong positive correlation (77%) between a respondent's preferences for the risk-weighted capital requirement and the leverage ratio requirement. Further, the strictness of a respondent's view on banking regulation relative to peers is negatively (and significantly) correlated with the respondent's view of the strictness of Basel III, which is also as expected.

Correlations in Table 8 provide further evidence of internal consistency of the responses. In particular, those who believe that the financial system is, at the time the survey was conducted, more resilient than 10 years before tend to prefer relatively lower minimum capital requirements. Those who think

a future financial crisis is more likely tend to believe that the financial system is (at the time of the survey) not more resilient. Further, those who think Basel III is too strict tend to believe that the financial system has improved in resilience, and that a financial crisis is unlikely. They also tend to think that their own views are not strict relative to their peers.

Overall, the response correlations across survey questions considered in this section generally speak in favor of consistency of the respondents' views.

## VII. Comparison to earlier literature

In this section we review the previous literature. We start by comparing our survey setting to similar ones from the methodological viewpoint. Second, we discuss results on the quantitative effects of (higher) bank capital requirements making use of earlier literature reviews in this regard. Third, we review the range of estimates for optimal bank capital requirements. Along the way, we comment on the approaches and results that compare with and help interpret our survey results.

### *Other expert surveys*

In addition to the aforementioned studies of Welch (2000), Graham and Harvey (2001) and Choi and Robertson (2019), there are a few surveys which are methodologically similar to ours. Fernandez et al. (2019) periodically conduct short email surveys of experts in finance with an average response rate of 9%. Krause et al. (2017) is a recent survey of European experts on labor market integration in Europe. Our survey is closest to theirs in terms of methodology in that both were conducted online with several email reminders. Possibly due to the closer association between the survey implementers and respondents, Krause et al. (2017) had a relatively high response rate of 42% (299 respondents from 708 invitations). A related but more policy-oriented regular survey of banks themselves on the

impact of Basel reforms is conducted by the Research Task Force of the Basel Committee for Banking Supervision (see BCBS 2019b for results on the latest round).<sup>18</sup>

Overall, our response rate (ca. 11%) compares well with similar studies. Our absolute number of respondents (149) is at the lower end of the range but broadly comparable to Welch (2000) who also focused on academic experts and had 226 respondents.<sup>19</sup>

### *Effects of capital requirements*

Several papers have surveyed the literature to make an assessment of the costs and benefits of bank capital regulation; e.g. Martynova (2015) and BCBS (2010, 2019a). A similar but model-based approach is to take existing models in the literature and conduct simulation exercises to provide a range of outcomes, e.g., Guerrieri et al. (2015). Notable recent contribution to this branch of the literature are meta-analyses which focus specifically on the effects of capital requirements; see the BIS FRAME repository (Boissay et al., 2019) and Fidrmuc and Lind (2018).

Martynova (2015) surveys the literature on the potential costs of higher capital requirements. Higher capital requirements tend to reduce the social costs of crises, but the evidence is mixed on whether this happens through mitigating banks' risk-taking incentives or by providing them with an additional loss-absorbing buffer. Related to banks' own funding costs and hence loan supply, she finds the evidence on the Modigliani-Miller hypothesis to be mixed; i.e, whether a change in a bank's capital structure has a material effect on the weighted average cost of the bank's capital. On the basis of her literature survey, one percentage point higher capital requirements lead to marginally higher interest

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<sup>18</sup> Key results from this survey indicate that banks take into account financial market conditions as well as return on equity and internal stress tests in managing regulatory constraints. Further, the survey documents heterogeneity on which particular requirement banks find hardest to meet and that complexity of regulation is a key challenge although appears to be manageable.

<sup>19</sup> Apparently Welch (2000), asking about views on the equity premium, surveyed academic financial economists in general while we have restricted the pool of academic experts to areas that are more directly relevant to bank regulation. This could partly explain the difference in our sample size.

rates on bank lending by 2-15 basis points. Short-term effects on bank lending volume from one percentage point higher capital requirements range at about 1%-5% reduction.

The Basel Committee's study (BCBS 2010) finds that higher bank capital requirements reduce the probability and associated costs of crises while potentially raising lending rates and dampening loan supply and economic output. In general, most studies tend to suggest that higher requirements reduce both the probability and costs of crises while increasing loan spreads and dampening output. However, using extensive historical data from multiple countries, Jordà et al. (2017) find that higher bank capital does not imply lower likelihood of a crisis but it does reduce the social costs of crises by helping to make macroeconomic recoveries from financial crises quicker.

Evidence from meta-analyses suggest that estimated effects on loan growth and output may be sensitive to whether second-round and general equilibrium effects are incorporated (Boissay et al., 2019). If they are, the negative effect on output and loan growth is mitigated. Consistent with this, macro models-based estimates (with general equilibrium features) tend to provide lower impacts than econometric approaches (Fidrmuc and Lind, 2018). Further, studies on more bank-based economies tend to provide stronger effects (Fidrmuc and Lind, 2018). Naceur et al. (2018) also find stronger negative impacts on loan growth in reaction to the Basel III by European banks relative to US banks. The US banks mainly adjusted to the new requirements by reinforcing their risk absorption capacities.

Estimates from a recent meta-analysis based on 48 studies suggest that there is on average a moderately negative effect on GDP of about 0.2 % for a 1 %-point increase in capital requirements (Fidrmuc and Lind, 2018). A recently constructed repository of studies providing a meta-analysis of the quantitative effects of higher bank capital requirements is provided by the BIS's FRAME (Boissay et al., 2019). For instance, using averages from 83 studies covering 15 countries and geographic groups, the meta-analysis reveals that the long run impact of a one percentage point increase in capital ratios is on average a 1 %-point reduction in the likelihood of a crisis while output decreases by a marginal 0.1 %, perhaps largely through investment which falls by 2.5 %. Further, there appears to

be a minimal if not a positive effect on bank lending with a 0.4 %-point increase in loan growth rate (apparently driven by studies which incorporate general equilibrium effects) and a 0.1 %-point increase in lending rates.<sup>20</sup> The latter effect is likely to result from the estimated 0.1 %-point increase in the weighted average cost of bank capital. Nevertheless, the meta-analysis by Boissay et al. (2019) reveals substantial heterogeneity in quantified impacts.<sup>21</sup>

How do views from this large literature compare with our findings? In our survey, we ask about the effects of five percentage points higher capital requirements (relative to the current Basel III norm) in a new steady state. Our response options are qualitative statements so we do not obtain quantitative estimates of the effects, only their sign. Overall, our findings are consistent with much of the literature in that higher bank capital requirements reduce the likelihood and the social costs of crises, tend to increase the weighted average cost of bank capital and cost of bank lending, and reduce loan supply and economic activity. Judging by the “average” or median answers, we find a clear emphasis on the strength of the first two effects, and an almost neutral effect in the case of economic activity. Hence, our qualitative findings based on expert views point to benefits of higher bank capital requirements relative to the current standards outweighing their costs.

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<sup>20</sup> The large strand of the literature that has investigated potential effects of higher capital requirements on loan supply include e.g. Hancock and Wilcox, 1998; Conti et al., 2018; De Jonghe et al., 2019; Deli and Hasan, 2017; Eickmeier et al., 2018; Fraisse et al., 2017; Glancy and Kurtzman, 2018; Imbierowicz et al., 2018; Kanngiesser et al., 2019; Meeks, 2017; Uluc and Wieladek, 2018; Tolo and Miettinen, 2018. At least a short-term negative effect on loan supply of higher capital requirements may be due to their positive effect on bank funding costs (Schmidt, 2019).

<sup>21</sup> An important subset of the literature has also explored unintended consequences of bank capital regulation as well as interactions with other forms of banking regulation, particularly liquidity requirements (Boissay and Collard, 2016; Faia, 2019; De Nicolo et al., 2014) and monetary policy (Gambacorta and Murcia, 2019; De Jonghe et al., 2019; Eickmeier et al., 2018; Meeks, 2017; Takats and Temesvary, 2019; Uluc and Wieladek, 2018). Other considerations are effects on banking competition (Corbae and D’Erasmus, 2019), liquidity in repo and other financial markets (Van Horen and Kotidis, 2018; Boissay et al., 2018; Haselmann et al., 2019; Cenedese et al., 2019), cross-border spillovers (Franch et al., 2019; Takats and Temesvary, 2019), risk-taking (Martynova et al., 2019) and portfolio rebalancing away from risky (but potentially productive) lending towards safer assets (bonds or household mortgages) (Cohen and Scatigna, 2016; Ambrocio and Jokivuolle, 2017; Juelsrud and Wold, 2018; Gropp et al., 2019; Mayordomo and Rodriguez-Moreno, 2018), the non-price terms of credit contracts (Mayordomo et al., 2019), and shift in intermediation towards shadow banks (Irani et al., 2018). Gehrig and Iannino (2018) find evidence which suggests that the introduction of internal credit risk models in regulation may have led to increased exposures to systemic risk.

As a methodological note, a key caveat to the results from literature surveys and meta-analyses is that the results from individual studies included in those are usually not directly comparable. They are sensitive to modelling assumptions and empirical settings. Consequently, how best to distill findings from a broad literature is left to the surveyor. Compared to these analyses our approach is complementary. By asking the experts themselves, we leave it to them to interpret their own research and knowledge of the literature.<sup>22</sup>

### *Optimal level of capital requirements*

As Dagher et al. (2016) note, in order to determine what is the socially optimal level of bank capital, one would need a model for estimating the costs and benefits of bank capital requirements, and to define an appropriate welfare function. Nonetheless, the seemingly precise answer from such an approach would be highly dependent on the specific model structure and parameterization.

Dagher et al. (2016) themselves survey the evidence in the literature to assess a related question: how much capital would have been needed to absorb losses in past crises. They come to the conclusion that 15 to 23 % of risk-weighted assets would have been sufficient. This is similar to estimates by Firestone et al. (2017) of 13-26 % for the US. BCBS (2010) suggests that optimal requirements are probably 13 %. However, a recent update (BCBS 2019a) finds that optimal requirements may be higher than previously reported. Proposed values from nine studies range from 10% to 25% of common equity (or Tier 1 capital) to risk-weighted assets. It was noted that an important source of variation in the estimates arises from differences in views on the long-term effects of higher requirements.

Work on the optimal level of capital requirements in light of other forms of banking regulation such as liquidity requirements and resolution regimes are still relatively scarce. Model-based assessments

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<sup>22</sup> Interestingly, Fidrmuc and Lind (2018) find a publication bias towards negative results, when they review studies on the effects of capital requirements. Our expert survey approach should in principle avoid such a bias.

of optimal capital requirements range from a 17% leverage ratio in Boissay and Collard (2016), a 28% leverage ratio in Goel (2016), Miles et al. (2012) suggest 19 %, Clerc et al. (2015) suggest 10.5%, Mendicino et al. (2018) indicate a range between 6% to 10% depending on the weight on savers as against borrowers in aggregate welfare, and Begenau (2020) suggests 12.4%. On the other end of estimates, Van den Heuvel (2008) suggests that the capital requirement of 10% was too high while Elenev et al. (2017) suggest that current requirements may be close to optimal given that their estimates range from 4% to 10%.

Our survey based average (median) estimate for the optimal risk-weighted minimum capital requirement of 17% (15%) falls well within the range of estimates obtained from the literature and may even be close to the midpoint of that range. Our survey based average (median) estimate for the optimal minimum leverage ratio requirement of 15% (10%) is more difficult to relate to the literature. Most of the purely empirical studies seem to focus on the risk-weighted capital requirement. On the other hand, few structural model-based estimates of optimal capital requirements explicitly model risk differences between loan customers (even at sectoral level). Hence the capital requirements they consider may effectively be closer to leverage ratio requirements. Moreover, we are not aware of studies that would consider the benefits and potential distortions resulting from simultaneous risk-weighted and leverage ratio requirements (as in the Basel III framework) in a sufficiently rich model that would lend itself to obtaining quantitative results for the socially optimal level of both type of bank capital requirements.

The relatively high dispersion of expert views on preferred bank capital ratios indicate that considerable uncertainty remains about optimal bank capital levels. The range of optimal bank capital ratios supported by the respondents seems to be even wider than the range obtained from the literature. Hence our survey results do not necessarily help to narrow down the range of estimates for optimal bank capital obtained from the literature. One possible interpretation is that there are doubts among experts of whether the current empirical or theoretical modelling approaches can capture all relevant

trade-offs that are needed to quantify the optimal level of bank capital requirements. It is also possible that the ranges of optimal bank capital requirements obtained from literature surveys and meta-analyses do not capture all estimation uncertainties related to individual studies.

## VIII. Conclusions

We have conducted a survey of 149 academic experts world-wide on their views on bank capital requirements and related bank regulations. Based on the average or median responses, the desirable (“optimal”) level of bank capital requirements, especially the leverage ratio requirement, is considerably higher than the current ones although there is large dispersion in views. The average preference for the minimum risk-weighted capital requirement and leverage ratio requirement are surprisingly close to one another. There is a marked difference between the average European and North American respondent, the latter of which prefers a significantly higher minimum leverage ratio requirement. The responses also provide general support for the new elements of the Basel III reform, as well as for adding a complementary market-based capital requirement to the current regulatory toolbox.

It is interesting to compare our results to some of the well-known reform proposals made in the literature. In their influential book, Admati and Helwig (2013, page 179) state that “(r)equiring that banks' equity be at least on the order of 20-30 percent of their total assets would make the financial system substantially safer and healthier”. According to our survey, roughly a quarter (23.6%) of respondents preferred a minimum leverage ratio requirement approximately between 20 % and 30 %. The share of respondents who preferred a minimum leverage ratio requirement of 20 % or more is 30.2%.

The survey also sheds further light on the channels through which bank capital requirements work in determining the trade-off between bank safety and economic activity. According to the respondents’

views, this trade-off mainly operates through the cost of bank lending: those who believe higher capital requirements raise the cost of bank lending more prefer relatively lower capital requirements.

The dispersion of responses to different questions help identify issues of bank regulation with relatively wide consensus vis-à-vis disagreement, and may thereby help guide future research efforts on bank regulation and its economic effects. On this basis, the use of hybrid and bail-inable securities in bank capital regulation might warrant further research.

Finally, we also received free-form comments from 52 respondents in the comment box provided as part of the survey, which we plan to analyze in future research.

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