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INTEGRATION OF FINANCIAL RISKS
WITH NON-FINANCIAL RISKS:
AN EXPLORATORY STUDY FROM PAKISTANI CONTEXT

Abstract: This research seeks to put forward a framework, from the perspective of practitioners and policymakers in Pakistan, about Financial and Non-Financial Risks integration and their impact on the Performance of Financial Institutions. We define total bank risk in terms of earnings volatility, which can be broken down into five major classes namey: market, credit, asset/liability, operational, and business. Out of these market, credit and Asset Liability risks are Financial Risks whereas operational and business risks are non-financial. Based on the thematic analysis of unstructured interviews of experts from the banking industry we position five sources of bank risks. We observe that the impact of Financial Risks decrease and Non-Financial Risks increase, along a spectrum from market risk to credit risk, asset/liability risk, operational risk, and business risk. The framework from this study could also be used to quantify total bank risks and contribution from each.

◼◼◼ INTRODUCTION

Financial Risk is the subject of majority of researches (Abdullah & Said, 2019). However, it is important to understand the extent of impact of financial and non-financial risks on earning volatility of a financial institution (Abdullah & Said, 2019). In this regard an important issue is the knowledge of risk dynamics by the risk managers (Tsintsadze, Glonti, Oniani & Ghoghoberidze, 2019). A knowledge that depicts thorough understanding of prioritizing risks within a framework (Asl & Nikouei, 2017). The practice of risk managers in financial industry is governed by Basel Accord which has promulgated risk based capital requirements (BCBS, 2001; Mburu, 2017).

Risk is the potential for deviation from expected results, and that practitioners are particularly concerned with adverse deviation. Within this context, we define financial and non-financial risks in terms that are closely related to the distinction made by Knight (1921) and used by Tsintsadze et al. (2019) between risk and uncertainty.

In general returns increase with the increase in risks. However, in the case of financial institutions this relationship is severely affected by the actions of various economic agents. This leads to various risk regulations a financial institution has to comply with. Regulations, which are particularly directed towards reducing the adverse consequences of risk taking. The risk return relationship within the context of a banking company is therefore not so straight forward, rather it has to be within a regulatory regime.

Quality of management is directly related with the expertise of risk managers. Current researches suggest that the focus of risk managers is also tilted towards managing financial risks although it has been established that the gravity and impact of non-financial risks is unknown, profound and a leading cause of financial setbacks. Risk Management is therefore need to be extended to develop a risk culture encompassing personnel, managers executives and organization working in line with the objectives of each other.

Based on this background our research questions are hereunder:

1. Whether the risks increase or decrease as both the ability to measure and disaggregate risk increase or decrease?
2. Whether recognizable and enigmatic risks increase or decrease as the ability to measure and disaggregate risk increase or decrease?

Given the interviews of experts, the rank order of these risks has based on two main characteristics: *quantification,* which reflects their ability to be measured, and *granularity*, which reflects their ability to be disaggregated. According to the ordering, market risk is the easiest risk to quantify and disaggregate, followed by credit risk, asset/liability risk, operational risk, and business risk. It follows that practitioners and policymakers "know" the most about market risk and the least about business risk. The boundary between what they know and don't know determines the portion of bankrisk that currently is (or at least can be) managed. The portion of risk that exists is managed, the portion of risk that is recognizable is managed and the portion of risk that is enigmatic is largely unmanageable.

REVIEW OF LITERATURE

Among practitioners, risk in banking is typically defined in terms of earnings volatility (Rajan, 2005; Becker & Buchkremer, 2018). Earnings volatility creates the potential for loss. Losses, in turn, need to be funded, and it is thepotential for loss that imposes a need for banks to hold capital (Hargarter & van Vuuren, 2017). Capital provides the balance sheetcushion that absorbs (downside) earnings volatility and prevents a firm from becoming insolvent (Berger, Herring & Szegö, 1995; Bouchet, Fishkin & Goguel, 2018).

The link between earnings volatility and capital is central to the way risk is measured in banking. Increasingly, risk is measured in terms of value-at-risk (VaR) or, equivalently, economic capital – the amount of capital needed to protect against earnings volatility at a prescribed confidence interval (Bovenberg & Nijman, 2017). The reason for measuring risk at a stated confidence interval is that volatility, by itself, is insufficient to describe the whole distribution of earnings (Butler & O'Brien, 2019). Two distributions with dramatically different shapes and differing amounts of downside risk can have the same volatility (Galli, 2019). VaR scales the volatility to a specified confidence interval so as to create a common currency for risk that allows different risk factors to be directly compared. It has been established over the period of time that stylized earnings (or loss) distributions for different bank risks have very different shapes, but, assuming a common time horizon, can each be measured in equivalent terms at the same confidence interval. Moreover, the standalone amounts for these risks can be aggregated (although, because of diversification effects,

not by simple addition) to create a single loss distribution for the bank overall (Kuritzkes, Schuermann & Weiner, 2003; Rosenberg & Schuermann, 2006; Tsintsadze et al., 2019).

The confidence interval for economic capital is usually set equivalent to the default rate associated with a bank's target debt rating or solvency standard. Assume, for example, that a bank's target debt rating is A-, and that the annual default rate for A- rated bonds is 0.1% or 10 basis points (bp). In this case, the bank would set the ruler for economic capital to be the amount of annual earnings volatility at the 99.9% confidence level, on the theory that this would determine the amount of capital the bank needs to remain solvent in all but 10 bp of possible loss scenarios – equivalent to the default risk of an A- rated bond.

While there is an internal logic for measuring risk at the same confidence interval as the bank's solvency standard, doing so implies an ability to quantify extreme events far out in the tail. To the extent that knowledge means being able to measure risks in terms of economic capital, then the threshold for A is set very high.

Taxonomy of Bank Risks

As risk management techniques have progressed, economic capital models have been extended to new classes of risk, providing greater resolution on the composition of total earnings volatility (Allen, Boudoukh & Saunders, 2004; Bui, 2019). These developments are reflected in the evolution of bank capital regulation under the Basel framework. In 1988, when the original Basel Capital Accord (Basel I) was adopted, bank risk management was overwhelmingly focused on credit risk (BCBS, 1988). Basel I based regulatory capital requirements solely on the size of a bank's credit assets, with varying risk weights intended to reflect (crude) differences in the levels of credit risk (Tsintsadze, et el., 2019). In 1996, the Market Risk Amendment to Basel I (BCBS, 1996) subjected the price risk of trading positions to an explicit capital charge, and helped institutionalize value at-risk measures for market risk within trading books. More recently, Basel II has singled out "operational risk" – defined to include losses from internal failures and external events – as a specific category of non-financial risk and is imposing a new capital charge to cover losses associated with operational risk.

Current practice among leading financial institutions is to break down earnings volatility into five main sources of risk as depicted in figure hereunder:

Figure 1. Taxonomy of bank risks
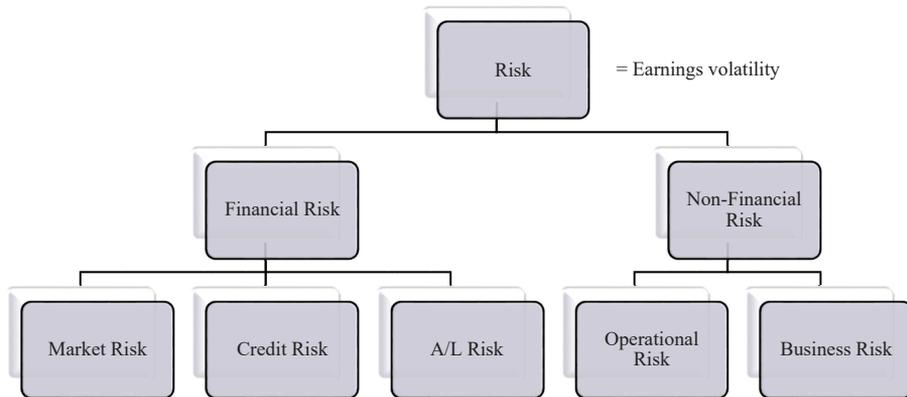
S o u r c e : Kuritzkes & Schuermann (2010).

This figure explains:
   i. Market risk, or the earnings impact associated with adverse price movements in the bank's principal trading positions (Musyoki & Komo, 2017);
  ii. Credit risk, or the potential for losses due to the failure to pay of credit counterparties (Van Zijl, Wöstmann & Maroun, 2017);
 iii. Structural asset/liability risk, or the earnings impact from shifts in interest rates on the bank's asset and liability positions (Cichulska & Wisniewski, 2017);
  iv. Operational risk, or (BCBS, 2005) "the risk of loss resulting from inadequate or failed internal processes, people, and systems, or from external events"; and
   v. Business risk, or the potential for losses from residual sources of non-financial earnings volatility.

The first three categories are sources of financial risk that are a direct result of a bank's role as financial intermediary or investor (Cichulska & Wisniewski, 2017). Since the assumption and transfer of financial risk are, in many respects, the defining features of a financial institution, these risks can be expected to predominate in banking (Costa-Climent & Martínez-Climent, 2018). The latter two categories refer to risks that are non-financial in nature, and common to all firms. Business risk, in particular, is a broad catch-all that includes all sources of non-financial risk not directly attributable to internal fail-

ures or external events (Hargovan, 2019). This category covers a host of sins, ranging from a drop in demand, a cost spike, technological obsolescence, regulatory change, price wars, and failed strategies, and can be expected to be the dominant risk faced by non-financial firms.

FRAMEWORK OF OUR STUDY:

Given the taxonomy of bank risk, we further categorize Financial and Non-Financial Risks into the following three categories; existing, recognizable and enigmatic risks, for taking the views of our practitioners where:

A risk is "existing" (A) if it can be identified and quantified. For a practitioner, risk quantification has developed a specific meaning: the ability to estimate downside tail risks or extreme loss events at high confidence levels associated with a bank's solvency standard. This concept is what underlies economic capital, the common denominator for risk measurement that has emerged within the banking industry. An economic capital approach to risk quantification is the basis on which capital requirements for credit, market, and operational risks are set under Basel II. All such risks are called financial risks.

A risk is "recognizable" (B) if it belongs to a set of risks that can be identified but not meaningfully quantified at present. An example of an unknown risk might be the impact of reputation risk following the criminal indictment of a bank's CEO for fraud. While the general class of reputation risks can be identified, the consequences are likely to be too diffuse and fact-specific to be meaningfully quantified. Over time, it may be possible for reputation risks to be linked to causal factors and estimated discretely, in which case reputation risks will become more "existent" but that is not the case given prevailing information and technology. For this reason, Basel II specifically excludes reputation risks from the category of "operational risks" for which banks must hold capital (BCBS, 2005). A risk is "enigmatic" (C) if the existence of the risk or set of risks is not predictable, let alone quantifiable. For instance, the risks that a terrorist attack might have on the businesses.

Based on these concepts, this paper proposes a framework for positioning different sources of risks of financial institutions in the A, B, C space from the point of view of risk managers and practitioners. Consistent with how risk is defined by practitioners, risk has been defined as deviation from expected earnings – or, equivalently, earnings volatility – and disaggregate risk into five main categories. The first three categories include market risk from trading

activities, structural interest rate risk from asset/liability management, and credit risk, which together constitute the main sources of financial risk. The remaining two categories refer to sources of non-financial risk, and include operational risk and "business risk" – this last category being a catch-all for residual non-financial earnings volatility.

We posit that these three types of risks vary according to two main factors. The first factor is *quantification*: We endeavor to explore dimensions between the above risk categories, as the ability to quantify risk increases. This relationship is axiomatic – it follows directly from our definition of A, B, and C – but it is important to recognize that the ability to quantify risk differs systematically by risk class.

The research methodology and the course of the research process

Research is primarily conducted under three major approaches i.e., qualitative, quantitative and mixed methods, though further variants are also possible by applying more than one method of a single approach in a particular research (Blaikie & Priest, 2019). Based on the nature of our research that is more of interpretive in nature because we are to understand the reasons of underlying motivations, reasons and opinions about integration of financial risks with non-financial risks, an interpretive approach (Creswell, 2003; Bryman & Bell, 2008) was adopted to capture the factors that influence Financial and Non-Financial Risks in Pakistani Banking Sector. The adoption of a qualitative research design allowed the researchers to explore and critically analyse the phenomenon of Financial and NonFinancial Risks in terms of their integrating affect on the volatility of their earnings. In addition, a qualitative research design helped the researchers investigate the meanings of participants' experiences in order to gain an in-depth understanding of how the risk manager and practitioners contextualize their experiences to gauge the integrated and individual impact of Financial and Non-Financial Risks of portfolio of the respective returns of their institutions.

Face-to-face qualitative interviews were conducted to gain rich data by means of participants" narratives through which to explore the phenomenon (Weiss, 1995; Sahiti, 2017). The interviews sought to analyse the factors that underpin risk managers' and practitioners' experiences in Pakistani Financial sector about Financial and Non-Financial Risks and have a unique influence. Participants for the study were selected using purposeful sampling (Marshall,

1996). Due to the data on Risk Professionals in Pakistan not being fully documented or reliable, purposeful sampling was supplemented with snowball sampling (Patton, 1990; Misund, 2017), in which respondents were asked to suggest and help to make contact with other risk professionals who fulfilled the following criteria used in the original purposeful sampling:

Risk managers who have atleast 5 years of working experience in Risk Management Division of Financial Institutions making policies about Financial and Non-Financial Risks.

Risk practitioners who have atleast 5 years of working experience in Financial Institutions implementing policies about Financial and Non-Financial Risks.

While not ideal, in the absence of a reliable/official register of Risk professionals fitting the required profile, this combined approach was necessary in order to augment the sample size.

Drawing on relevant literatures, an interview guide was developed that addressed the perception of both types Risk professionals. The interviews covered the perception of Risk Professionals about financial risks that include Market, Credit and Asset Liability Risk; and non-financial risks that included operational and business risks. We tried our level best to keep a balance upon addressing both types of risks during our interviews. However, due to most of the experience of risk professionals was in the area of financial risks therefore the discussion of financial risks during most of the interviews was very dominant. The interviews began with a brief introduction to the study. They were conducted in Urdu. Participants were assured about data confidentiality and personal anonymity. All interviews were recorded with the consent of the participant, transcribed and sent for member checking (Guba & Lincoln, 1989) to enhance the credibility and quality of the data. At the end of each interview, the participants were given a demographic survey to complete as a source of background information. Thematic analysis (Stirling & Attride, 2001) was undertaken to identify the emerging themes and organize data for qualitative analysis.

Analysis of Findings and Discussions of interview themes

The rationale for the current positioning of bank risks in the views of interview participants within the framework is as follows:

Market Risk

Discussing about the market risk from the category of financial risks during the interviews most of the risk professionals were of the opinion that market risk is the most "existent" of the all risks, our knowledge is far from perfect. Illiquid instruments, which "trade by appointment," may have daily VaRs calculated for them, but the underlying volatilities may not be very meaningful.

According to a Risk Manager Mr. S:

"More liquid instruments, such as currencies with managed exchange rates, are subject to regime change, as evidenced by the break-up of the European Exchange Rate Mechanism in September 1992."

Even the best models sometimes fail to capture complex correlations – witness the collapse of LTCM in the fall of 1998 (Jorion, 2000; Kumor & Poniatowska, 2017). For this reason, we regard a portion of the space in market risk as "recognizable" and "enigmatic".

Credit Risk

Discussing about the credit risk from the category of financial risks most of the risk professionals were of the view that the transaction-level attributes of credit risk indicate that credit risk measurement is highly granular, in principle down to the level of individual loans. This is the level at which credit risk is priced and managed, and a wide range of quantitative applications – including pricing tools, RAROC (Risk Adjusted Return on Capital) measures, and hedging models –support decision-making at this level.

As with market risk, the state of knowledge within credit risk varies by asset class. More is known about relatively liquid credit classes, including (in the U.S.) corporate bonds, mortgages, credit cards, other consumer receivables, and loans to publicly-rated, large corporate, and less is known about illiquid credit classes, such as loans to small businesses, commercial real estate, and middle-market companies (Treacy & Carey, 2000).

As according to a Risk practitioner Mr.Q:

"Even in the more liquid asset classes, credit risk quantification can only go so far. Default is a rare event, and sparse data sets – unlike the ultra-high frequency observations in market risk – limit the accuracy of measurement at both the transaction (PD, LGD, EAD) and portfolio (UL, economic capital) levels. Moreover, since credit default rates vary over the business cycle, the calibration and validation of credit risk measures pose unique challenges."

The research in credit risk measurement also suggests that credit risk is subject to more "recognizable" than market risk. Structural shifts in default risk, recovery levels, utilization rates, and credit correlations can all have a major impact on credit quantification. Credit risk is also subject to "enigmatic" unknowable regime change – e.g., a change in bankruptcy laws in the U.S. For example, Gross and Souleles (2002), in looking at the impact of bankruptcy regulation on consumer debt in the U.S., find that as bankruptcy costs decline, default likelihoods increase, often substantially.

Structural Asset/Liability Risk

Discussing about the Structural asset/liability risk from the category of financial risks, most of the risk professionals were of the view that this is related to market risk, although the measurement problem is far more challenging. While the dominant risk factor in asset/liability risk is movements in interest rates – and there is a long tradition among both financial economists and practitioners in modeling interest rate paths – this is not where the principal difficulty lies. The challenge comes from the need to characterize indeterminate cash flows on both the asset and liability side; from the valuation of embedded options and hedges in a bank's investment portfolio; from the long holding period assumed for a bank's structural balance sheet; and, perhaps most importantly, from the lack of convergence on a measurement standard (Bessis, 1998; Saunders, 2000).

Unlike market or credit risk, there is no standardized approach for asset/liability risk measurement. In fact, practitioners do not even agree on whether the appropriate measure is an earnings approach based on Net Interest Revenue volatility, or a value approach based on changes in the Economic Value of Equity (EVE) [defined as the present value of assets minus liabilities (Koch & MacDonald, 2000).

As pointed out one of the Participant Mr. A:

"The measurement debate is partly driven by the arcane accounting treatment of interest earnings from a bank's investment portfolio, with some assets (but not necessarily corresponding liabilities) receiving mark-to-market treatment, while other assets (those deemed to be "available for sale" or "held to maturity") are recognized on an accruals basis."

Lack of consensus on how to measure asset/liability risk was reported to be a major reason why interest rate risk outside the trading book was not sub-

jected to an explicit (Pillar 1) capital charge under Basel II but is covered under Pillar 2 instead (BCBS, 2005).

Given the lack of standardization, it is not surprising that there is a wide range of sophistication in asset/liability risk measurement. Simplistic approaches include calculating the impact of fixed rate shocks – such as a 100 or 200 bp parallel shift in yield curves – on the bank's EVE and net interest revenues. Basel II suggests such a simple 200 bp parallel shift test as a means of identifying banks that are outliers in terms of asset/liability risk. More sophisticated approaches subject the balance sheet to full simulation of interest rate movements, and calibrate outcomes based on probabilistically-weighted scenarios (including tail-risk scenarios) (Bessis, 1998).

Operational Risk

Discussing about Operational risks from the category of Non-Financial Risks the risk professionals were of the view that the operational risk is the newest risk class to emerge as a discrete category. Prior to the early consultative papers for Basel II, there was no agreement on what the definition of operational risk was, let alone how to measure it. Basel II established a standardized definition and classification scheme for operational risk – subdividing internal and external events into seven recognized categories, limiting operational risks to the "direct" consequences of operational losses, and excluding indirect consequences such as reputation effects from the definition. Going forward, Basel II requires that banks seeking to adopt the Advanced Measurement Approach for operational risk (the only option available for U.S. banks) develop internal economic capital models to estimate a bank's exposure to operational losses at the 99.9% level over a one-year horizon (BCBS, 2005). Prior to the Basel II pronouncements, operational risk was often included together with other non-financial risks as "operating risk," and measured in economic capital frameworks, if at all, through analogs and benchmarks such as revenue and expense ratios (Uyemura & van Deventer, 1992, Netter & Poulson, 2003; Valipour & Vahed, 2017).

Basel II has catalyzed a major industry effort to model and measure operational risks. The challenge in operational risk measurement, however, is that operational losses appear to be extremely fat-tailed (De Fontnouvelle, Jordan & Rosengren, 2006; Rosenberg & Schuermann, 2006; Peršić, Janković & Krivačić, 2017). The losses that are most relevant for measuring economic

capital are, by definition, low frequency, high severity events that are difficult to observe within any one firm.

According to one of our participant Mr. G:

"Consistent with the immature state of operational risk measurement, the world of the unknown in operational risk is commensurately larger than for market, credit, or A/L risks. Arguably, operational risk contains risks that are recognized today that were previously unknowable. An example was the World Trade Center attack on 9/11/2001, the direct consequences of which are an "external event" included within the Basel II definition of operational loss."

Similarly Kuritzkes and Scott (2005) note the general category of legal risk as being subject to ex post judicial and regulatory interpretations, some of which may not be foreseeable ex ante. Examples of such risks could include the vulnerability of Swiss banks to holocaust claims in the mid-1990s, four or five decades after the accounts of holocaust victims were mishandled, as well as more recent rulings and regulatory decisions in the aftermath of the Enron and WorldCom scandals holding banks to be vicariously liable for customer fraud. Valipour and Vahed (2017) show how this type of ex ante legal risk influences management behavior and earnings forecasts.

Business Risk

Discussing about Business Risks from the category of Non-Financial Risks the risk professionals were of the view that Business risk is the last frontier of risk classification and measurement. As with operational risk before Basel II, there is no standard definition of business risk, which is sometimes also referred to as strategic" risk (Slywotzky & Drzik, 2005; Rusanov, Natocheeva, Belyanchikova & Bektenova, 2017). Within the taxonomy above, business risk is best understood by reference to what it is not: it is residual earnings volatility that is *not* caused by any of the other defined categories, including market, credit, A/L, or operational risks.

According to one of our risk professional Mr. M:

"Many banks do not include an explicit measure of business risk within their economic capital frameworks. For those banks that do, business risk is measured through one of a few alternative approaches: the simplest approach is to infer business risk capital requirements from the capitalization levels of non-financial firms that are engaged in similar activities (e.g. processing, consulting, IT services). Another approach is to strip out financial and operational risks

from publicly-reported data on bank earnings and construct a proxy measure of business risk volatility for a sample of peer banks. A third approach is to develop an explicit model of residual revenue volatility and cost rigidity at the business line level."

In terms of granularity, business risk is easiest to observe at the bankwide level. Of all the risk types, it is the one we are the least able to break down to lower levels of aggregation. This is not to say that business risk is not "managed" but simply that it is hard to manage in a granular fashion. Banks, like the Basel II regulators, have tended to ignore the impact of business risk, or seem to think of it as indistinguishable from "strategy."

■■■ Conclusion

Referring to the discussion above our positioning of bank risks in the A, B, C space can be summarized in a few propositions. Our knowledge of bank risk increases as our ability to quantify risk increases. Our knowledge of bank risk increases as our ability to disaggregate risk to more granular levels increases. Our knowledge of bank risks shifts over time, as new risks become discretely classified and subject to measurement with increasing granularity. Based on these propositions, the evidence from market practice suggests that: 4) Our current knowledge of market risk > credit risk > structural asset/liability risk > operational risk > business risk. Although we know more about the ordering of risks than the contours of the A, B, and C typing analysis within the risk space, we reason that: The "existent" (A) type falls off between financial and non-financial risks, as market, credit, and structural asset/liability risks are much easier to quantify and disaggregate than operational or business risk; and The "recognizable" (B) type rises steeply for operational and business risk, given the diffuse nature of these risks and the lack of historical The second factor is *granularity*: A increases, and B and C decrease, as the ability to measure risk at lower levels of aggregation increases. The granularity dimension reflects systematic differences in the ability to measure and manage risks at multiple levels in the organization. The more granular the understanding of risk, the better one is able to identify it, measure it, and control it. In market risk, for example, the marginal impact of individual trades on a bank's overall market position can be measured, possibly even in real-time, with a fairly high degree of accuracy. Risk managers can therefore manage the risks of individual trades, as well as the cumulative risk in a bank's trading businesses, through dynamic

VaR limits. In business risk, by contrast, some risks, such as reputation risks, may only manifest themselves at the firm-wide level, and may not be capable of being disaggregated to lower levels. The inability to disaggregate such risks makes them more difficult to control at the source.

Based on these factors, a framework for positioning the sources of risk in banking.

Can be established where five main sources of bank risks can be ordered in terms of their ability to be quantified and disaggregated. The risks can be ranked in this framework from the most quantifiable and granular, and hence most "existent," to the least. Such framework also has a time dimension to it. Such ordering of risks reflects existing state of contemporary practice. Over time, the boundaries of the "existent" can be expected to be pushed out, as risks are more finely classified, additional data is collected, and new models are developed.

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