Abstract

This conceptual paper outlines the definition of operational risk and its relevance to the operations management community. It argues that in overcoming inconsistencies in the Basel II definition of operational risks ‘risks associated to failure of people, processes, systems and/or external events, including legal but excluding strategic or reputational risks’, that Operational risk is rather ‘risk of process failure’, and places the challenge within the operations management conceptual paradigm. The ‘process perspective definition’ of Operational risk, and the core objective to seek efficiency and effectiveness in management of Operational risk, opens opportunities for association and research with a wider range of production, quality and performance management disciplines e.g. performance management systems, stakeholder and decision making theories. Further the revised definition has greater recognition and consistency with the concept of sustainability, and allows for attributing risk outcome into social, political and economic contexts.
Introduction

Operational Risk is an imprecise term, often used to denote a risk other than risk associated to market and capital risk, it is this negative description that leads to its heterogeneous application (Currie 2004:70).

Due to both rapid evolution (Power 2005: 581) and because it initially came about as a catch-all category for other risks (Lopez 2003), through this definition we see pluralistic translation in application causing the term either to be over generalised “it is a label for a diverse range of practices” (Power 2005:579), or de-scoped to have a meaning closer to ‘Operations Risk’ (Loader 2007). This concept stretch damages efforts for precise transfer out of a finance context. As a definition it is not global enough for transfer into other industries (Kalhoff & Haas 2004:5). Seeking precision in the definition has more than a theoretical benefit, through definition we see it as a concept being operationalised, it “re-positions their location and status for managerial and regulatory purposes” (Power 2005:578).

This paper accepts that the finance sector has originated the term Operational Risk, and that in its application (both at a practitioner level and as theory development) the discipline of Operational Risk Management has been developed under this paradigm. It is argued that under scrutiny the Basel II definition of risk has a number of consistency issues, which when resolved lead to an refined definition of Operational Risk. This refined definition (the process perspective) is not in contrast to the Basel definition, rather it clarifies the existing disputes in boundaries, providing delineation to credit and market risk, but in so doing places itself clearly in the domain of the Operations Management practitioner.

This paper begins by outlining the existing definition of Operational Risk and the existing disputes within the finance sector. A content analysis of journal papers from Operations Management, Finance and Economics are presented; demonstrating the relevance and need for the OM community to engage with the discipline of Operational Risk management.
The issues in existing definition are categorised as: internal, external and philosophical inconsistencies, and through example lead to a conceptual challenge. In response this paper presents a process perspective definition of risk, based on a causal approach to the term. Finally a conclusion is presented that offers opportunity for further research and engagement from the Operations Management discipline.

Defining Operational Risk

“The risk of loss resulting from inadequate or failed internal processes, people and system or external events. This definition includes legal risk, but excludes strategic or reputational risk.”

(Basel Committee 2006:para 644)

It is these inclusions (legal) and exclusions (reputational and strategic) that generate the greatest challenges in transfer from the finance sector; whilst the core definition of people process systems and external events in many ways are too general for assisting creation of structures in other sectors (Kalhoff & Haas 2004:5).

Operational Risk is a concept taken to include only pure risk, regardless of whether it is being applied to finance or non-finance industries. This position is supported through best practice guidelines (Institute of Operational Risk 2009), case studies into Operations failures and successes (Abkowitz 2008), Nicholas Leeson’s ‘rogue trader’ study (Loader 2007) which is situated as the origin of Operational Risk interest (Power 2005:579), failure-centric definitions in Basel II (1998) and wider presentation as loss-making events (Power 2005:584) (Engemann & Miller 1992:141). There is limited literature to support some practitioner’s perspective that Operational Risk is speculative risk management. Positive imprecision in an Operational Risk context does not lead to loss-making events, as such the effort is usually focused on downward mitigation (Institute of Operational Risk 2009).

Theoretical speculative risk is reflected in credit and market risk, which are risks associated to the financial dealings of the firm. As market and credit risk are closely associated terms, they should offer some definitional boundaries to Operational Risk. The next sections outline the
definitions provided through the Basel framework (2001, 2006). Operational Risk outside of the finance sector may be considered to be more aligned to ‘Pillar 2’ principles (Basel II 1998) – “risk management control and practices” (Power 2005:582), rather than the original objective of capital adequacy (Pillar 1).

Focus on Operational Risk

The purpose of defining Operational Risk in the Basel II paper (2006) is to set out requirements (or at least articulate requirements for convergence) for capital adequacy of active international banks (Power 2005:558). The Operational Risk definition was originally codified for this purpose, and not intended for roll-out to other industries. The Basel definition, even with its conflicts, is the most readily cited definition of Operational Risk in finance and economics literature.

A content analysis was undertaken using five of the principle US and UK operations management journals, based on a quarter one SJR ranking (SCImago 2008): The Journal of Operations Management: 0,057 SJR, Journal of Supply Chain Management: 0,041 SJR, Production and Operations Management: 0,049 SJR, Manufacturing and Service Operations Management: 0,049 SJR and International Journal of Operations and Production Management: 0,047 SJR (SCImago 2008) between 1999 and 2009. Using titles, keywords and abstracts containing the term ‘risk’ were coded to ensure risk was situated as a core topic within the paper (table 1). Other than an expected focus on Supply Chain (58% over the period), developing the discussion about risk has been diverse from Project Management through to off-shoring risks; but noticeably had only a single reference to ‘Operational Risk’ but not using the Basel II definition. The sample from JOM and JOSCM excluded nineteen papers that contained risk in the abstract, title or keywords, but did not develop the topic as a core element.
A contrasting content analysis was undertaken in six finance, economics and strategy journals:

Journal of Finance: 0.102 SJR, Management Science: 0.072 SJR, Journal of Money, Credit and Banking: 0.052 SJR, Journal of Banking and Finance: 0.043 SJR, Insurance, Maths and Economics: 0.051 SJR and International Journal of Production Economics: 0.056 SJR (SCImag 2008) between 1999 and 2000 for the more specific term of ‘Operational Risk’. The abstracts and titles were analysed to ensure suitability as being an ‘Operational risk’ focused paper, in the same manner as the first content analysis. Secondly they were analysed for their source of Operational Risk definition, results presented in table 2.

The findings show that there has been a steady (2.5 times) increase per year in reference and focus on Operational risk in our sample of finance, economics and strategy journals from 2001
onwards (using a regression analysis with $R^2$ of 0.89, and considered significant). Further that in 2009, 93% of papers used the Basel II definition (2006) of Operational Risk. Compared to a less significant trend ($R^2$ of 0.57) of the topic of ‘risk’ in OM journals that shows only a 0.9 annual increase on the subject, and no reference to the specific concept of ‘Operational Risk’; POM 2005 contained a special edition featuring risk, if this edition was removed the correlation improves to a $R^2$ of 0.75 and annual increase of 0.8. This establishes Operational Risk as a growing concern in finance, economics and strategy disciplines and establishes the Basel II definition as the benchmark by which further analysis should be undertaken.

As this paper shows the focus of Operational risk in the finance industry is one of a risk that is to be controlled and efficiently managed rather than avoided or paradoxically entered into, in contrast to market and credit risks management. Operational Risk has become the focus on process efficiency and control that is more akin to process engineering or operations management.

The problems identified in the continuing convergence of Operational Risk and Credit and Market risk in finance literature (Macaulay 2008), in transfer out of the finance sector, and in part the issues inherent in the initial Basel II definition can be identified under five headings

![Figure 3 Regression Analysis of Journal keyword/abstract in Risk/Operational Risk](image-url)
below; these are separate from Currie’s (2004:71) technical and applied challenges to the finance definition, instead focusing on definitional consistency.

**Issues in Internal Consistency**

Defining risk as “risk from people, processes and systems and external events” is causal in origin, whereas definition of *reputational risk* is an outcome based description. To be consistent, either cause or outcome should form the sole basis of the Operational Risk concept. Practitioner application of the existing definition has found to be deficient in reflecting these causal relationships (Vares 2004:25).

Regardless of the level of abstraction applied to the causal description of Operational Risk, it may be deduced that a failure in process or practice could lead to both an economic and reputational loss (amongst other losses). This is a one to many relationships between cause and outcome. I.e. process failure of Exxon Valdez (1989), resulting in $1.3billion dollars of direct financial loss to the Exxon Corporation also caused, significant reputational damage to the company, the ship as well as an outcome of *environmental* loss (damage), subsequently financially valued in clean up at $2.2billion (ExxonMobil 2004).

Whether our categories of risk are defined through causation, outcome or even by means of a temporal dimension, the critical element in definition must be consistency of terms (internal consistency). The same conflict of *cause* or *outcome* is seen in the exclusion of strategic risk, which is in itself a contentious term.

*Strategic risk* can be interpreted under two paradigms, either the risks associated in the position a strategy may place the organisation (a consequence of strategy) or a risk of strategic importance (severity). Where the originating cause of risk to be realised is consistent with the ‘people, process, system and external event’ classification, it should not be excluded by whether the risk has a tactical or strategic significance.
In a more abstract fashion, and more akin to a temporal consideration, is ‘strategic risk taking’, the product of a strategy (as a cause) and more closely aligned to the intended meaning in Basel (Macaulay 2008). A popular reference to the scale-centric view returns back to Baird and Thomas’ 1985 definition of strategic risk(taking) as “corporate strategic moves that cause returns to vary” (1985:231).

The decision process (or underlying analytical process) whether of a strategic or tactical decision maker will invariably still be the cause of the threat. In itself the cause of a strategic risk, will be underpinned by any issue from poor market information through to poor implementation of a strategy - “in the pursuit of business objectives” (Emblemsvag and Kjolstad 2002:846). Therefore this interpretation of strategic risk should be inseparable from the core principle that Operational Risk originates from people, system or process failure and most likely external events.

Issues in Philosophical Consistency

If traced to source one can argue that all risks originate with ‘people’, termed the origin. ‘Processes’ or ‘Systems’ are an intermediary step, one level of abstraction above that of the origin. Adopting a Realist ontological perspective, it is possible to differentiate, in the domain of the real (Bhaskar 2008) between structures that generate risk positions, i.e. data, external events or process from the power that generates the risk position, i.e. humans.

In an ultimate pursuit into the cause of a risk, we trace back to the critical factor - bringing the uncertainty (the risk) into the path of an organisation, or more appropriately ‘bringing the organisation into the path of an outcome (with loss potential) which it is uncertain of’.

Uncertainty and therefore the potential for a loss-event are brought around though human choices (these events occur in the Realist’s domain of the actual and experienced in the empirical). Taking two fictional examples to illustrate: a. Union strike preventing the sorting of mail b. Tornado that destroys a data centre (which under Basel is an external event caused loss). In (a) it is seen how failure in people (a strike) leads to the outcome of a loss of service i.e.
inability to deliver mail, this is an Operational failure brought around through a failure in people, or Industrial Relations processes; and consistent with the Basel definition. In (b), harder to see but equally attributed to a failure in people, or more precisely people decisions. The building and design of a data centre was ultimately a decision made by a person or group of people, uncertainty (subjective or objective) in the event of a tornado happening resulted in the loss-event. It was the building and design of the data centre that generated the loss (although it was at time of design and building a latent loss-event); approaching this from an alternative position, the tornado can be assumed was going to occur irrespective of the building of the data centre. Therefore the loss must be attributed to the instance of the building of the data centre, and more precisely its design. Consequently the loss may be traced back to the original causation of a human decision.

This dissection of the causation of all risk being attributed to people, is not a proposition that the definition of risk should be altered to reflect causation to be people-centric, else all risk have to be attributed to the social world, and therefore even market and capital risk definitions collapse. Instead the paper proposes that a theoretically sound and practically appropriate definition for Operational Risk is not looking at the failure in people or at the systems they design, instead it approaches failures in the business processes themselves; whether these are due to decisions, execution of task (intentionally or not) or lack of awareness of external forces.

**External events**

External events include social-political forces that may influence any market or organisational dynamic, ranging from interest and exchange rates (Market risk) through to sovereign ability to make payment (Capital risk).

This is an argument that positions the origin of risk, even ‘an act of god’ as human failure. This example identified *external events* as natural events. In realist terms the social world is an open and complex system; inherently brought around through human actions, and therefore subject to the same criticism presented before. Even if this criticism is refuted, using *external events* as an
inclusive characteristic of Operational Risk, builds conflict with Operational Risk as a product of market conditions i.e. macro economic conditions may cause a rise in interest rates (market risk), that may at the same time prevent the availability of housing and therefore access to a workforce (operational risk). Although the outcome may be observed through two different perspectives, use of *external events* as a differentiator assumes market and capital risk is caused only through internal financial failures. This definition if taken literally creates conflict, with credit and market risk definitions.

**Issues in delineation from Market risk**

Market risk in a non-finance context (i.e. not equity price risk, exchange risk or interest rate risk), is commodity risk (Crouhy et al 2001:179), and under an Operations Management paradigm can be placed in the domain of the internal or external supply chain.

Duplication with Market risk is most relevant where considering transfer outside the finance sector. As part of the definition of market risk, the importance of uncertainty (volatility) in price of commodities (Crouhy et al 2001:179) is observed. Although initially this term seems reserved for the price of commodities, it has an immediate consequence on ‘availability’ of commodities. Under a *pure risk* consequence not all firms have elasticity in their ability to purchase commodities. Therefore volatility in commodity price transfer can become volatility in availability.

This impact on availability, may be assigned to external supply chain risk (internal supply chains may be seen as a means of mitigating commodity availability risk), which is under existing definition both a product of external events and also failure in supply process, and using our definition of the origin (of risk) a failure in the process of forecasting commodity price. Even if excluded from Operational Risk definition outside of the finance sector, the transfer of Operational Risk is affected by the conversion of the classification of Market risk.
Issues in delineation from Credit risk

The non-finance sector may also exhibit counterparty credit risk as defined by Jarrow (2001:1766); extension of the finance definition may include the ability to secure and maintain credit lines from banks and therefore also considered credit risk. The dispute on delineation from process or system based Operational risk can be seen through challenging whether counterparty risk is a risk associated to the billing and collections process or even the credit checking and monitoring process?

Similar to the conversion issues of market risk between finance and non-finance sectors, credit risk also adopts new characteristics, or at least different priorities, than in the finance description. Where is a failure in transaction (one with for consideration of cash payment), a credit risk realised, or a failure in billing, collections or even credit checking – an Operational Risk, a challenge supported by Croughy et al (2001:475)? Perhaps the two may be divided, again using subjective uncertainty belief, that credit risk is the performance of the customer and their ability to pay, operational risk is the process of credit checking which inherently has an imbedded risk appetite/ tolerance built into the decision process.

A Process Perspective

To offer a revised definition of Operational Risk, the requirement for internal consistency, philosophical consistency and clear delineation to associated terms, must be met. Crouhy et al (2001:475-513) provide an alternative definition that is consistent with but not subservient to the Basel II definition. “Operational risk is the risk associated with operating a business” (Crouhy et al 2001:478), and are further subdivided into Operational failure risks (OFR) and Operational strategic risks (OSR) (Crouhy et al 2001:479); both of these definitions focus attention to the business as a set of inter-related and complex series of processes, of which may be subject to predictable and unpredictable failure. Crouhy et al (2001) present a causal relationship between an OSR and OFR (figure 4a) that an OSR may lead to an OFR. Whereas using the same approach and step in deduction propose that this relationship may be turned 180
degrees, that the processes to monitor and respond to strategic changes are themselves underpinned by business processes, what Crouhy et al refer to as OFR (figure 4b).

A. Relationship between OSR and OFR adapted from Crouhy et al 2001

Operational Strategic Risk (External Influences) → can lead to → Operational Failure Risks (Failure in PPS)

B. Proposed alternate view of relationship between OSR and OFR (author)

Operational Failure Risks (Failure in business process) → can lead to → Operational Strategic Risk (External misalignment)

Figure 4 Relationships between OFR and OSR

The approach is to conceptualise Operational Risk at the process level. This recommendation to classifying risk in this manner originates from both a practical perspective, and an adaptation from the realist philosophical belief. It is through the process perspective that the internal, external and philosophical inconsistencies are managed, particularly where the descriptions are set out as an ordered set of laws (rather than equal partners) Credit → Market → Operational. If the process is visualised as a number of interacting and complex sub-processes/ sub-tasks, comprised of systems, people, internal relationships and external affects, each may be seen to affect the output i.e. the potential for a loss-event. A failure of an information system (and therefore classified as a system failure) may have been due to a lack of skills from the application developer (person failure), in itself caused by market demands for specific technical skills at the time (external event). The classification into a single bracket becomes moot.

Managing this system failure may never become a loss-event if there exists risk management structures within the process i.e. manual error correction come into force. However the mitigation opportunity may reside in a different category of causation; so the approach should be to approach Operational Risk in a level of aggregation as a process.
With visualisation at a process level, probability of failures become theoretically significant in recognition and handling of risk, as management strategies can be considered. A process perspective removes isolated assignment to specific tools within the process i.e. knowledge, people or systems, rather that a process is an input-transform-output construction. Operational risk becomes ‘risk in the process’.

The process perspective is echoed in practitioner terms “In practical terms this [Operational Risk] involves the risk of things going wrong with the day-to-day processing activities of the firm...” (Securities Institute 2004:4-3). It is the focus on processing capabilities that becomes central to the definition. This process perspective is supported by the need to view the realisation of risk as a product of the system as a whole (Oren 2001), and not just threat of failure of a component part; this approach is particularly relevant as the specific cause of a loss-event is not always identifiable (Power 2005:588), whereas from a process perspective it becomes attributable.

As the definition of Operational Risk is more than a theoretical or ‘labelling’ exercise, it helps define jurisdictions and functions of Operational Risk management (Power 2005:584). A process perspective allows an organisation to analyse at a level of abstraction available to them; where a process is defined and therefore the intended output it becomes relevant to discuss and define Operational Risk. Where generalisation of a process becomes meaningless to the management of risk, it allows for segmentation of sub-processes i.e. planning errors can be broken down to A. Identification of existing costs B. Allocation of changes C. Entry onto spreadsheet D. Communication of new budgets – sub-division of this process, alters the approach to manage the risks: Identification phase requires the accurate identification of existing costs which will have specific mitigation strategies available, and different to risks associated to allocation of budget changes.
In provision of a generic and paradigmatically consistent definition I propose Operational Risk is:

*Where not a credit or market risk...*

*The potential for failure in an existing business process leading to a loss-event; the loss-event (realised or unrealised) will have a direct consequence resulting in an economic, social, political or environmental loss.*

**Conclusion and Further Research**

Dispersion in literature has occurred through the breadth of terms being employed to classify risk. These appear largely contingent and paradigmatically specific, i.e. Supply Chain Risk (Kleindorfer et al 2005:53), Disruption Risk (Kleindorfer et al 2005:54), Project Risk, Legal Risk (Basel II 2006), People Risk, Political Risk (Jensen 2005), Culture Risk (Securities Institute 2004:1-8) etc. Some of these are a description of the outcome (of the process): political risk, culture risk, disruption risk and reputational risk. UBS were unusual in their contradiction to Basel II definitions by presenting reputational risk as an outcome of all risk types, underlying market, capital and operational however this is distinct separation of outcome. Other definitions can be logically assigned to specific discipline operational risk categories, in a procedural framework i.e. Supply Chain Risk is caused through failures in the supply chain processes, Project risk is caused through failure in project management process etc. This therefore places Operational Risk as an umbrella category of risk, but distinct from market and capital risk.

In compliment to the finance community (who are largely accepted as leaders of risk forecasting and modelling practices), the OM (or OR) community where the expertise of process mapping and efficient operations may be brought to bear in the objective of efficient and effective management of Operational Risk. It may require that in Operations Management alignment of terms to define risks are required, that Supply Chain risk, Project Management risk etc become exemplars of Operational Risk management under a more specific and procedural perspective. In this manner Operational Risk should become the domain of the OM practitioner.
References


Operational Risk Management (ORM) is simply a formalized way of thinking about these things. ORM is a simple six-step process, which identifies operational hazards and takes reasonable measures to reduce risk to personnel, equipment and the mission. In FAA operations, decisions need to take into account the significance of the operation, the timeliness of the decision required, and what level of management is empowered to make the decision. Risk management must be a fully integrated part of planning and executing any operation, routinely applied by management, not a way of reacting when some unforeseen problem occurs. Operational risk management is an on-going activity and an inseparable and integrated part of the Bank's business operations and procedures. 4.3 Structure to identify and manage operational risks. The Bank’s activities and operations have been defined as a set of core and sub processes in which operational risks can occur, and in which the Bank's operational risks consequently will be identified, reported, followed up and managed. To reflect changes in the Bank’s operations and/or organisational structure, the defined core and sub processes might from time to time be amended. 4.4 Risk control strategies and guidelines.