

# A global central banker competency model

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**Dates:**

Received: 07 Feb. 2013  
Accepted: 30 Jan. 2014  
Published: 30 July 2014

**How to cite this article:**

Brits, D.W., & Veldsman, T.H. (2014). A global central banker competency model. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 12(1) Art. #575, 14 pages. <http://dx.doi.org/10.4102/sajhrm.v12i1.575>

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**Orientation:** No comprehensive, integrated competency model exists for central bankers. Due to the importance of central banks in the context of the ongoing global financial crisis, it was deemed necessary to design and validate such a model.

**Research purpose:** To craft and validate a comprehensive, integrated global central banker competency model (GCBCM) and to assess whether central banks using the GCBCM for training have a higher global influence.

**Motivation for the study:** Limited consensus exists globally about what constitutes a 'competent' central banker. A quantitatively validated GCBCM would make a significant contribution to enhancing central banker effectiveness, and also provide a solid foundation for effective people management.

**Research approach, design and method:** A blended quantitative and qualitative research approach was taken. Two sets of hypotheses were tested regarding the relationships between the GCBCM and the training offered, using the model on the one hand, and a central bank's global influence on the other.

**Main findings:** The GCBCM was generally accepted across all participating central banks globally, although some differences were found between central banks with higher and lower global influence. The actual training offered by central banks in terms of the model, however, is generally limited to technical-functional skills. The GCBCM is therefore at present predominantly aspirational. Significant differences were found regarding the training offered.

**Practical/managerial implications:** By adopting the GCBCM, central banks would be able to develop organisation-specific competency models in order to enhance their organisational capabilities and play their increasingly important global role more effectively.

**Contribution:** A generic conceptual framework for the crafting of a competency model with evaluation criteria was developed. A GCBCM was quantitatively validated.

## Introduction

### Key focus of the study

Over the past 4–5 years, the role of central banks has grown increasingly important globally. Their role has shifted from national, micro regulation to global, macro regulation (Linde, 2012; *The Economist*, 2013; Vergara, 2012). In some quarters, it is contended that central bankers have become the most powerful players in the global economy. As stated in *The Economist*:

Before the financial crisis started in 2008 central bankers were often seen as back room technocrats: unelected, unexciting men in grey suits, who adjusted interest rates to keep prices stable on the basis of widely agreed rules. Today, the suits are the same, but not much else. Central bankers have become the most powerful players in the global economy. By providing massive liquidity to the financial system, they saved the world from economic collapse in 2008 (2012, p. 15).

### Background to the study

Although many central banks agree on what the core functions of a central bank should be, there is little or no consensus globally about what constitutes a 'competent' central banker. The growing importance of the global role of central bankers, as well as the absence of a global competency model for central bankers provided the rationale for this study. More specifically, the study was intended to establish a 'common language' for central banks to converse globally about central banker competencies (Stevens, 2013).

### Review of the literature

The literature reported here covers the following topics:

- competencies
- competency models
- competency modelling
- evaluating the effectiveness of a competency model.

## Competencies

A competency is a general description of the underlying knowledge, skills and attributes that people need to deliver worthy job performance (Stevens, 2013). According to Buford and Linder (2002), LaRocca (n.d.) and Parry (1998), competencies pertain to behaviour of a certain standard required for successful performance that cover a set of related knowledge, skills and attributes. Wynne and Stringer (1997, p. 20) define competencies simply as 'those things employees have to be, know and do, to achieve job outputs'. For Dubois's (n.d.) competence are the personal characteristics that drive superior job performance. Competencies allow organisations to translate their business strategies, imperatives and objectives into performance requirements for their employees (Stevens, 2013).

For the purpose of this article, a *competency* is defined as a composite of the knowledge, skills and attributes that lead to worthy job performance. In addition to the term competency, the terms *competency cluster* and *competency domain* were also introduced in this study. A competency cluster is defined as a collective name for a set of related competency domains. A competency domain, in turn, is defined as being made up of related competencies.

## Competency models

Competency models can provide organisations with a flexible and dynamic base from which to engender a competitive advantage (Soderquist, Papalexandris, Ioannou & Prastacos, 2010; Stevens, 2013). According to Garrett (n.d.), a competency model embodies a collection of the success factors necessary for achieving results in a specific job in the organisation, as well as the realisation of its strategy (Stevens, 2013). Mirabile (1997) describes a competency model as an enabler to distinguish between high and low performers. Since this study focused on the competencies required by occupational groups, a more accurate explanation of a competency model would be that it is a selection of competencies required by a specific occupational group at the individual, team and organisational levels (Stevens, 2013). A mere listing of competencies has more value for its users if similar competencies are grouped together to form a model (Parry, 1996).

For the purpose of this study, a *competency model* was defined as a set of competency domains, with their associated competencies, required by a specific occupational group.

## Competency modelling

A proposed competency modelling process, with its specific stages and commensurate steps for each stage, is discussed and summarised in Table 1.

Table 1 indicates that the development of a competency model requires a systematic ten-step process. The *first step* in the process is to communicate the need for the competency model. Durgin (2006) declares that, before a competency model is developed, it is important for everyone who will be involved to understand fully the purpose of having a competency model and what its benefits would be. The *second step* is preparing the organisation to accept the competency model and how the model will contribute to talent management.

The *third step* is to specify the design considerations for the competency model. This depends, according to Parry (1996), on how the competencies will be used in the organisation. The *fourth step* is to define the requisite levels of work applicable to the organisation. Jaques and Clement (1994) proposed the stratified systems theory, which states that there is increasingly complex, critical work at each successively higher organisational level. The *fifth step* is to collect information about the key activities performed by an occupational group.

The *sixth step* is to translate activities into the key knowledge, skills and personal attributes that make a master performer successful (Zemke & Zemke, 1999). The knowledge, skills and personal attributes applicable to various occupational groups must also be determined. This bundle or group of key activities make up a generic competency, not a single activity (Truesdell, 2001). The *seventh step* is to align the competency model with the organisational strategy, which constitutes its *vertical alignment*. According to Schippmann *et al.* (2000), the increased interest in organisational competencies, together with the fast pace of change in the business world, most likely encouraged a concurrent interest in individual competencies supporting the business strategy. An organisation should invest time and resources in developing competency models as a component of a larger commitment to talent management, connected to the overall business strategy (Brown, 2006).

Similarly, it is important to align the competency model with the people management framework, which constitutes its *horizontal alignment*. This goal is achieved by aligning all the people management functions to the competency model to ensure harmony and consistency (Rothwell & Wellins, cited by Ramlall, 2006). In this way, competency models remove the barriers that often arise between disjointed people management functions. This means that the competencies and their associated behavioural indicators become a common language across all people management functions (Campion *et al.*, 2011).

The *eighth step* is to officially sign off the competency model, preferably by the CEO, before it is implemented in the organisation. The *ninth step* is to provide opportunities for employees to obtain the new knowledge, skills and expertise as specified by the compelling model (Brown, 2006). The *tenth and final step* is to continuously assess the competency model for its relevance and added value.

**TABLE 1:** The competency modelling stages with their commensurate steps.

Stage	Step 1	Step 2	Step 3	Step 5	Step 7	Step 8	Step 9
Stage 1: Create awareness of the need to build a competency model.	Define and communicate the purpose and objectives of the competency model exercise throughout the organisation.	Determine the organisational strategy and objectives to inform the competency modelling exercise.	-	-	-	-	-
Stage 2: Prepare the organisation for the development of the competency model.	Obtain buy-in from key interest groups and change agents to act as sponsors of the change process for building and implementing the competency model.	Formulate the change navigation plan.	Organise information session with senior management to co-plan the process to be followed.	Schedule regular review and feedback sessions to inform senior management of progress made.	-	-	-
Stage 3: Set the design considerations for competencies and the competency model.	Establish the relevance of the competencies to be included in the competency model.	Decide on the level of analysis required.	Verify the similarity of competencies.	Prioritise competencies.	Validate competencies.	Define the requisite levels of work applicable to the organisation.	-
Stage 4: Collect data about the key activities performed.	Ascertain the purpose of the function.	Verify the frequency of key activities performed.	Ensure the relevance of activities.	Measure the difficulty level of key activities.	Determine the standards required to perform key activities.	Describe the level of commitment required to perform the key activities.	Consider the stability versus transience of the key activities performed.
Stage 5: Build the competency model by translating the key activities into competencies.	Cluster key activities into knowledge, skills and personal attributes.	Prioritise the knowledge, skills and personal attributes according to the key activities.	Cluster the knowledge, skills and personal attributes as these apply to the various occupational groups.	Develop a taxonomy (classification) of knowledge acquisition and application at different levels of complexity.	List the competency domains, and group the knowledge, skills and personal attributes under each domain.	Validate the competency domains and associated competencies.	-
Stage 6: Ensure alignment of the competency model with the organisation.	Align the competency model with the business strategy, focus areas and philosophy (vertical alignment).	Align the competency model with the people management framework and processes (horizontal alignment).	-	-	-	-	-
Stage 7: Signing off of the competency model.	Sign off the competency model.	-	-	-	-	-	-
Stage 8: Roll out and assess effectiveness.	Prepare the organisation for the implementation of the competency model.	Implement the competency model.	Monitor and assess the effectiveness of the model by measuring the value added by the model against key indicators.	Take corrective action to improve the effectiveness of the competency model.	Evaluate the success of the corrective action.	-	-

Source: Based on Campion, Fink, Rugeberg, Carr, Phillips and Odman (2011); Durgin (2006); Montier, Alai and Kramer (2006); Schippmann *et al.* (2000); Soderquist, Papalexandris, Ioannaou and Prastacos (2010); Stevens (2013).

Note: Please see the full reference list of the article, Brits, D.W., & Veldsman, T.H. (2014). A global central banker competency model. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 12(1) Art. #575, 14 pages. <http://dx.doi.org/10.4102/sajhrm.v12i1.575>, for more information.

## The evaluation of a competency model

The competency model also needs to be evaluated against a set of criteria. Such a set of criteria, sourced from literature, was developed by the researchers, as illustrated in Figure 1. A competency model, as the product of the modelling process, should be assessed in terms of these criteria, and enhanced if necessary. The best approach would be to have a knowledgeable person or persons, perhaps even the users of the model, conduct such an assessment, independently of the person (or persons) who developed the model.

## Problem statement and objective of study

The study was directed and guided by the following problem statement: The growing importance of central bankers and the fact that there is currently no globally validated competency model for central bankers prompted the need to develop and validate such a competency model. The objective of the research was twofold: firstly, to craft and validate a comprehensive, integrated, global competency model for central bankers and, secondly, to assess whether central banks that use a comprehensive, integrated competency model, and develop these competencies, have a higher global influence as a central bank.

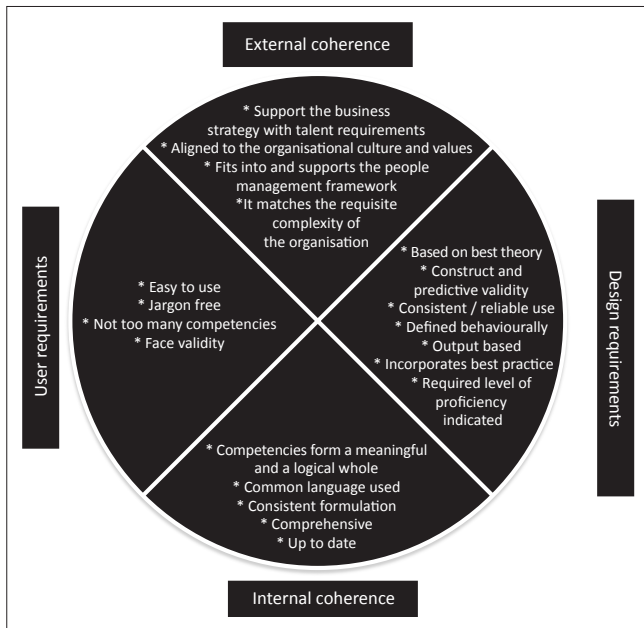
## The potential value-add of the study

The contention of the study is that a globally validated central banker competency model would make a significant contribution to enhancing central banker effectiveness. Such a model would also establish a sound and solid foundation for effective people management (Fisher, Schoenfeldt & Shaw, 1999; Rothwell & Wellins, 2004; Stevens, 2013; Veldsman, 2011).

## Method

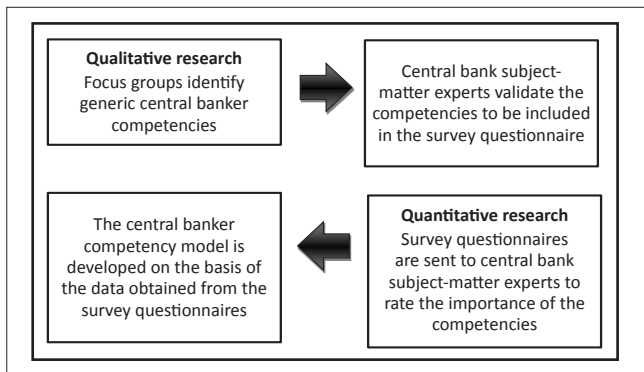
### Research approach

The sources and nature of the data to be collected to meet the objectives of the study called for a blended research approach. Jogulu and Pansiri (2011) assert that a combination of qualitative and quantitative research approaches is epistemologically coherent. Such an approach is useful for data generation and verification of findings. The use of a qualitative research approach, such as focus groups, allows for longer engagements with participants, which gives ample time to deliberate issues more intensively. In the case of this study, this approach assisted the researchers to use the qualitative data to construct more comprehensive and relevant survey questionnaires. The application of the blended research approach in this study is illustrated in Figure 2.

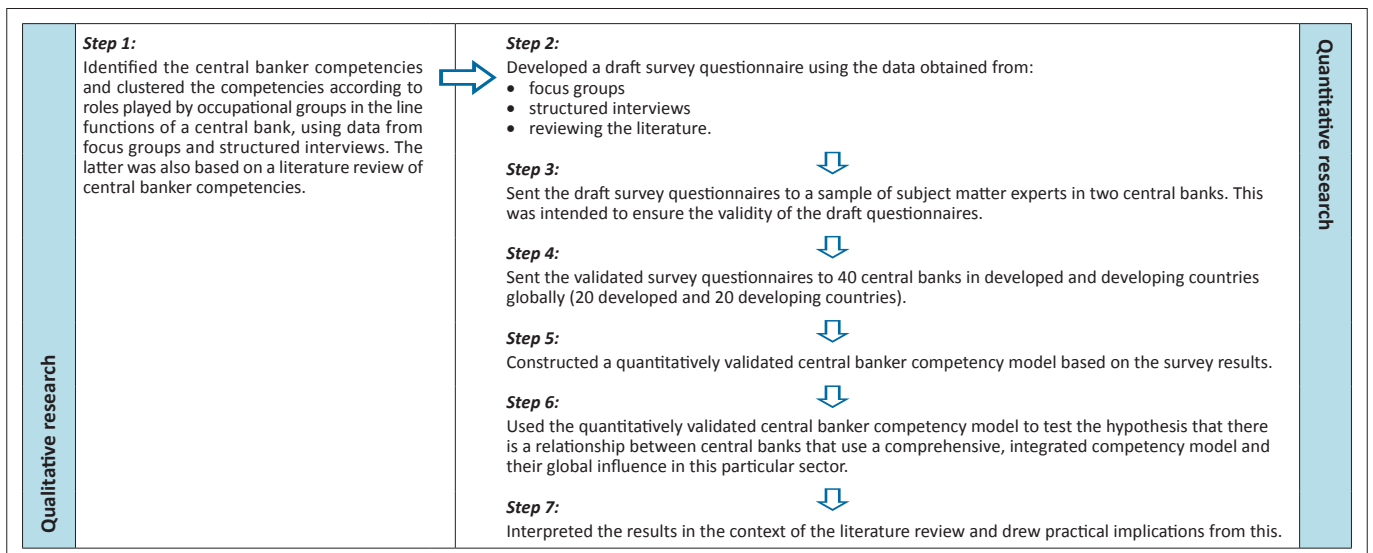


Source: Based on Brown (2006); Dalton (1997); Dutrisac, Koplowitz and Shepard (2009); Gangani, McLean and Braden (2006); Lievens, Sanchez and Corte (2004); Montier, Alai and Kramer (2006); Moyer (2001); Robinson and Robinson (1998); Stevens (2013); Verwey (2010); Wells (2009); Zemke and Zemke (1999).  
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**FIGURE 1:** Evaluation criteria for assessing a competency model as constructed by the researchers.



**FIGURE 2:** The blended research approach used in this study.



**FIGURE 3:** Research process employed.

From an ethical point of view, the respondents were given the assurance that their identities will not be disclosed. With regard to the data used, the use and misuse of the data presented were avoided by ensuring not only that the reported conclusions were based on accurately recorded data but also that all relevant observations are reported. A commitment was also given to the respondents that they will receive the generalised results of the study.

### Research design

The research process followed three successive phases. During Phase 1, a proposed central banker competency model was generated, based on a review of the available literature. During Phase 2, this proposed model was converted into a qualitatively enhanced central banker competency model, using the information obtained from focus groups. Finally, in Phase 3 the global central banker competency model was quantitatively assessed by means of a questionnaire survey of a representative sample of central banks. The research process used in this study is illustrated in Figure 3, in the form of a sequential process flow, showing the seven steps that the researchers followed across the abovementioned three phases.

During Phase 2 of the study, the empirical data collection entailed identifying the key activities that are performed by global bankers, by engaging subject matter experts in multiple functional specialist focus groups (106 participants in 16 focus groups). The focus group were conducted in a single central bank forming part of the high global influence group. The output from the focus groups, in the form of competencies, was used in constructing the survey questionnaires. The draft questionnaires were sent to select persons in central banks globally to review. During Phase 3 of the study, the empirical data collection proceeded by sending the final questionnaires to respondents in central banks from the G-20 countries (i.e. those banks that could be regarded as having a higher global influence), plus other central banks that are not part of the G-20 countries (i.e. those banks that could be regarded as having a lower global influence).

### Research participants

The population consisted of all of the central banks in the world. The sample was drawn by selecting central banks from both developed and developing countries, as well as differentiating between banks with higher and lower global influence. In order to measure effectively the dependent variable, namely global influence, the sample was selected using the criterion of membership in the Group of Twenty (G-20) – the finance ministers and central bank governors from the 20 major economies of the world. Central banks from European Union (EU) countries were also regarded as having a higher global influence, because they make up the European Central Bank, which is the 20th member of the G-20. Central banks falling outside this group were regarded as having a lower global influence.

In total, 40 central banks were invited to participate in the study. Thirty banks responded. The fact that 30 out of a potential 40 central banks responded (75%) is deemed an excellent response rate. However, a limitation of the study was that, for various reasons, a number of major central banks decided against participating, namely the Federal Reserve Bank of New York, the People's Bank of China, the European Central Bank and the Bank of Japan.

The 30 participating central bank training providers per country and G-20 members were: Australia (G-20), Austria (G-20/EU), Botswana, Belgium (G-20/EU), Canada (G-20), Czech Republic, United Kingdom (G-20), France (G-20), Germany (G-20), Italy (G-20), Kenya, Malawi, Malaysia, Namibia, Netherlands (G-20/EU), New Zealand, Portugal, South African Reserve Bank College (G-20), Seychelles, South Africa (G-20), Slovakia, Spain (G-20/EU), Swaziland, Switzerland, Tanzania, Mauritius, Mexico (G-20), Mozambique, Zambia and Zimbabwe.

### Measuring instruments

The independent variable of the study was the presence or absence of a comprehensive, integrated central banker competency model. The measurement of the independent variable focused on the extent to which the central banker competency model for a given central bank was integrated and comprehensive.

Two questionnaires, constructed by the researchers, were used for the measurement and validation of the competency model. The first questionnaire dealt with the functional and professional specialisation competencies within a central bank. The second questionnaire consisted of four sections: (1) enabling competencies, which addressed the knowledge and skills individuals should have to get along well with co-workers and to function effectively in the central bank, (2) leadership or management competencies, dealing with competencies related to leading and managing people, (3) ethical competencies, focusing on ethical and values-related

competencies and (4) contextual complexity competencies, addressing increasingly more complex critical competency requirements at each successive organisational level.

The dependent variable referred to the global influence that a central bank has. High global influence was defined as being a member of the G-20. Low global influence was defined as a central bank being not a member of the G-20.

### Research hypotheses of the study

Two sets of hypotheses were tested in this study.

#### Hypothesis 1:

$H_0$ : The presence or not of a comprehensive, integrated central banker competency model does not affect the global influence of a central bank.

$H_a$ : The presence of a comprehensive, integrated central banker competency model does affect the global influence of a central bank.

#### Hypothesis 2:

$H_0$ : The training offered or not in terms of this competency model does not affect the global influence of a central bank.

$H_a$ : The training offered in terms of this competency model does affect the global influence of a central bank.

The relationship between the study variables and hypotheses is illustrated in Figure 4.

### Statistical analysis

The data generated during Phase 3 of the study was analysed using the SPSS 12 (2004) software package to provide statistically processed answers to the empirical research questions. Descriptive statistics were used to determine the profile of the sample from which the data had been obtained, as well as the statistical features of the data collected. The Mann-Whitney *U* test and Pearson's chi-squared test were used to test the hypotheses. The small sample size led to the decision to use these non-parametric tests, as they are not as sensitive to deviations from multivariate normality and smaller sample sizes.

## Results

The results are reported according to the three phases followed in the study.

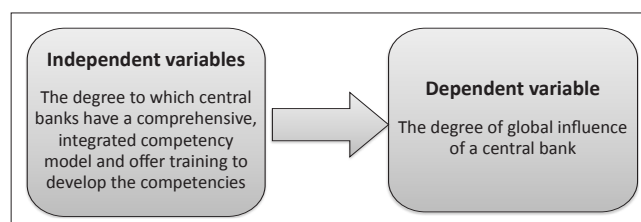


FIGURE 4: Relationship between the study variables.

## Phase 1: A proposed central banker competency model

In building the proposed central banker competency model, a literature review was conducted of publicly available competency models. Four generic competency models were reviewed: the SHL universal competency framework (Bartram, 2012), the World Health Organization (WHO) global competency model (WHO, 2010), the leadership competency model (Central Michigan University, n.d.) and the organisation-person fit competency model (Veldsman, 2010).

In general, the assessment of these models against the competency model evaluation criteria showed the following strengths: (1) each competency model formed a meaningful and logical whole, (2) a common language was used throughout to describe the competencies, (3) the models were based on sound theory and best practices and (4) the competencies did not merely constitute a wish list.

The four models, to varying degrees, also have shortcomings in terms of: (1) not supporting specific organisational strategies with their talent requirements, (2) limited alignment to specific organisational cultures and values, (3) having too many competencies, (4) not supporting a specific people management framework and (5) not indicating the level of proficiency required. The shortcomings listed regarding (1), (2), and (3) may not be real weaknesses, but a function of the models claiming to be generic (or universal) models (except for the WHO global competency model), which implies that organisations using any of these models need to customise them to fit their organisations.

As regards the currently available competency models for central banks, two models were reviewed: the European Central Bank (ECB) competency model (Fehlker, 2004) and the unendorsed South Africa Reserve Bank competency model (Gidlow, Ngcobo, Du Plooy & Smal, 2002). The following overall key strengths were identified for these models: (1) a common language was used throughout, (2) the models supported the organisational strategy, (3) the models were comprehensive enough to support the range of competencies making up the functions of a central bank and (4) they matched the requisite complexity of the central banks concerned.

The following overall key weaknesses were identified: (1) due to the comprehensiveness of these models, they could be cumbersome to use, (2) the behavioural descriptions of each competency were not consistently described in an output-based format and (3) there was a need for some form of measurement to distinguish between varying levels of proficiency for each of the competencies.

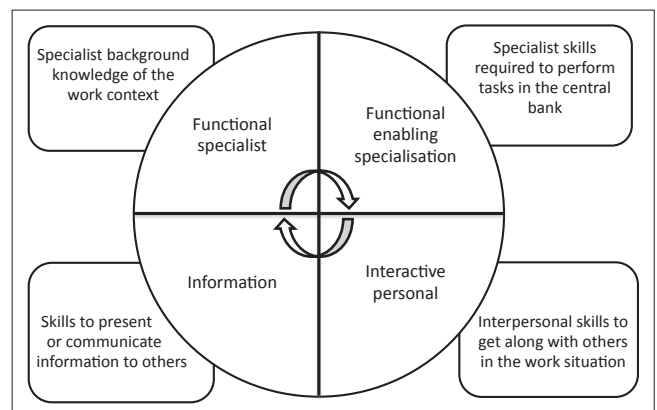
The literature review of publicly available competency models helped the researchers to develop a proposed central banker competency model. The proposed model comprises four competency clusters with their associated competency domain descriptions, and is given in Figure 5.

## Phase 2: Qualitatively expanded central banker competency model

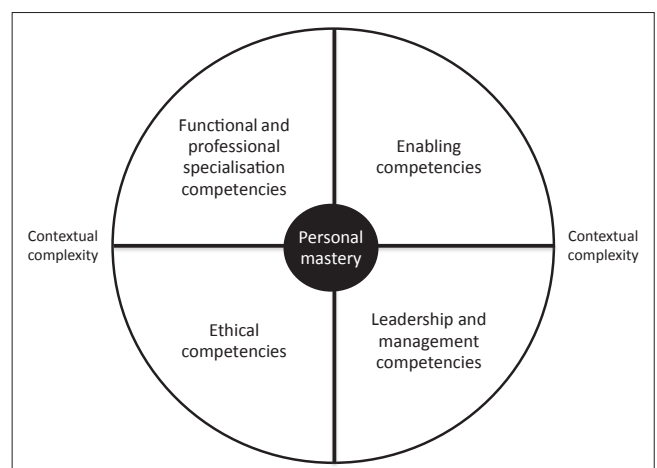
The proposed model served as a conceptual framework for the development of a qualitatively expanded central banker competency model. The inputs obtained through the focus groups assisted the researchers to identify competency clusters and competency domains with their associated competencies.

This qualitatively expanded central banker competency model comprised the following competency clusters: (1) functional and professional specialisation competency cluster, which was constructed using the information obtained from focus group meetings and from the proposed central banker competency model, (2) enabling competencies, (3) leadership or management competencies, (4) ethical competencies and (5) contextual complexity competencies. Competencies (2)–(5) were all constructed from the information sourced from the generic, publicly available and central bank competency models reviewed. The various competency clusters comprising the qualitatively expanded central banker competency model are given in Figure 6.

According to Figure 6, the levels of work (Jaques & Clement, 1994) provide the context, that is, the contextual complexity competencies, in which all of the other competency clusters are embedded and have to be made specific to the requisite



**FIGURE 5:** Phase 1: The competency clusters of the proposed central banker competency model as constructed by the researchers.



**FIGURE 6:** Phase 2: The competency clusters of the qualitatively expanded central banker competency model as constructed by the researchers.

complexity of the respective organisational levels and an organisation's overall complexity. Personal mastery, one of the two competency domains of the enabling competencies cluster, is central to all four competency clusters, because of the researchers' view that it forms the basis of all of the other competency clusters.

### Phase 3: A quantitatively validated global central banker competency model

Two survey questionnaires were constructed, based on the competencies making up the qualitatively expanded central banker competency model resulting from Phase 2. The purpose of the first questionnaire was to validate quantitatively the *functional and professional specialisation* competencies (i.e. the competencies specific to central bankers). The purpose of the second questionnaire was to validate quantitatively the *enabling, leadership or management* and *ethical* competencies, as applicable to central bankers.

The quantitatively validated global central banker competency model (GCBCM) is, in essence, the same as the qualitatively expanded central banker competency model of Phase 2, with two exceptions: (1) the relevance of the competencies was quantitatively confirmed and (2) the areas in which training was offered by central banks were determined.

With regard to the functional and professional specialisation competency cluster, the profile sample of central bank technical subject matter experts (e.g. economists) who responded was:

- Length of service: 33.3% had 21 years of service.
- Period in current position: 54.0% had been in their current position for up to 5 years.
- Position held: 50.0% were managers.
- Function: 32.0% worked in the bank supervision or financial stability areas.

With regard to the enabling, leadership or management, ethics and values competency clusters, the profile sample of central bank officials (e.g. managers or training officials) who responded was:

- Length of service: 35.0% had between 16 and 20 years of service.
- Period in current position: 65.5% had been in their current position for up to 5 years
- Position held: 38.5% were training and development practitioners or experts and 27.0% managers.
- Function: 48.0% worked in the learning and development area (e.g. training department or institute or corporate university).

The GCBCM, as constructed by the researchers, is diagrammatically displayed in Figure 7.

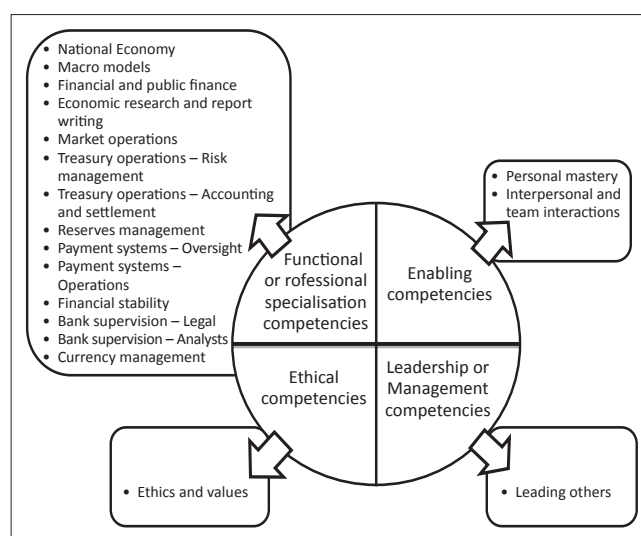
According to Figure 7 the GCBCM comprised four competency clusters: the functional and professional specialisation competency domain, the enabling competency domain, the leadership or management competency domain and the ethical competency domain. The levels of work provide

the context (contextual complexity) in which the critical competencies making up the central banker competency model have to be embedded, and be made specific to each organisational level.

## Psychometric properties of the competency survey questionnaires

### Reliabilities

Cronbach's alpha correlation was used to measure the internal consistency (reliability) of the survey questionnaires. Table 2 displays the Cronbach's alpha reliability coefficients for all three competency clusters, with their associated competency domains. The closer the Cronbach's alpha correlation coefficient is to 1.0 the greater the internal consistency of the items in the scale.



**FIGURE 7:** Overview of the quantitatively validated GCBCM as constructed by the researchers.

**TABLE 2:** Cronbach's alpha reliability coefficients of the competency survey questionnaires.

Topic	Category	Cronbach's alpha	Number of items
Functional and professional specialisation competency cluster with associated domains	National economy	0.74	13
	Macro models	0.95	11
	Financial and public finance	0.92	17
	Economic research and report writing	0.93	18
	Market operations	0.9	16
	Treasury operations: Risk management	0.91	16
	Reserves management	0.94	14
	Treasury operations: Accounting and settlement	0.86	16
	Payment systems: Oversight	0.82	14
	Payment systems: Operations	0.84	13
	Financial stability	0.74	14
	Bank supervision: Legal	0.81	13
	Bank supervision: Analysts	0.92	15
	Currency management	0.92	23
Enabling competency cluster with associated domains	Personal mastery	0.83	33
	Interpersonal and team interactions	0.92	16
	Leading others	0.89	31
Ethical competency cluster	Ethics and values	0.91	16

As indicated in Table 2, the Cronbach's alpha correlation coefficients ranged between *excellent* and *good*, with only two coefficients in the *good* range: national economy and financial stability. George and Mallery (2003, p. 231) give the following rule of thumb in this regard:  $\geq 0.9$  = excellent,  $\geq 0.8$  = good,  $\geq 0.7$  = acceptable,  $\geq 0.6$  = questionable,  $\geq 0.5$  = poor and  $\leq 0.5$  = unacceptable.

### Inter-correlations of the competency clusters

The overall inter-correlations of the means for the four competency clusters are displayed in Table 3.

Table 3 shows significant correlations between the enabling, the leadership or management and the ethical competency clusters ( $p \leq 0.05$ ). No significant correlations were found between the hard and soft competency clusters. One could readily accept that relationships would exist between the enabling, the leadership or management and the ethical competency clusters, because they contain soft competencies, in contrast to the functional professional competencies, which are made up of hard competencies.

The inter-correlations of the contextual complexity domain with the four competency clusters are displayed in Table 4. There was a significant positive correlation between contextual complexity and the enabling and leadership or management competency clusters ( $p \leq 0.05$ ).

### Global central banker competency model competencies: Relevance and training offered

Due to space limitations, the detailed GCBCM is not represented here, but is available upon request. However, the GCBCM showing only the 10 most relevant competencies per competency domain, together with the degree to which training is offered in these competencies, is given in Table 5.

A five-point Likert response scale was used for assessing the relevance of the central banker competencies. A score of 1 represented very high relevance, and a score of 4 represented

very low relevance. In terms of the scale, a competency was regarded as relevant if a response was equal to or smaller than a rating of 2. A cut-off point of 2 was used for reporting the relevancy results. A cut-off of 60% or more was used to indicate in which competencies training was mostly offered. The researchers considered: (1) the distribution of the scores and (2) the category definitions of the response scale when making decisions on cut-off points.

Overall, the competencies were scored as either very high relevance or high relevance. An average of 80% of the respondents scored all of the competencies as most relevant across all four of the competency clusters.

In the case of the functional and professional specialisation competency cluster, the respondents viewed most of the proposed competencies as most relevant, with an average of 91%. In the case of the enabling, leadership or management, and the ethical competency clusters, the respondents viewed most of the proposed competencies as most relevant, with an average of 76%.

The highest percentage of competencies trained in per cluster was 59% (finance and public finance domain of the functional and professional specialisation competency cluster) and 60% (interpersonal and team interaction domain of the enabling competency cluster). Only 17% training was given in the ethics and values domain competencies. Across all competency domains, the average was 31% training (median: 27%), with the corresponding averages being 32% (median: 30%) and 28% (median: 20%) for, respectively, the hard (functional and professional specialisation cluster) and soft competencies (the enabling, the leadership or management, and the ethical clusters in combination).

### Global central banker competency model competency clusters: Relevance and training offered

The relevance using the overall mean score for each competency domain is given in Table 6. The relevance percentages are given for each competency domain.

**TABLE 3:** Inter-correlations of the four competency clusters.

Cluster	Contextual complexity	Functional professional specialisation competency cluster	Enabling competency cluster	Leadership or management competency cluster	Ethical competency cluster
Functional professional specialisation competency cluster	Pearson correlation	1	0.14	0.1	0.06
	<i>p</i> -value	-	0.51	0.64	0.76
	<i>N</i>	-	23	23	22
Enabling competency cluster	Pearson correlation	-	1	0.91	0.75
	<i>p</i> -value	-	-	0.01	0.01
	<i>N</i>	-	-	23	22
Leadership or management competency cluster	Pearson correlation	-	-	1	0.74
	<i>p</i> -value	-	-	-	0.01
	<i>N</i>	-	-	-	22

**TABLE 4:** Inter-correlations of contextual complexity amongst the four competency clusters.

Contextual complexity	Functional and professional specialisation competencies	Enabling competencies	Leadership or management competencies	Ethical competencies
Pearson correlation	0.03	0.51	0.56	0.07
<i>p</i> -value	0.89	0.01	0	0.76
<i>N</i>	21	21	21	20



**TABLE 5:** Quantitatively validated global central banker competency model: Top ten most relevant competencies and training mostly offered.

Competency domain	Most relevant competencies	Training mostly offered
National economy	<i>Applying knowledge about monetary policy; analysing and drawing conclusions from economic theory; analysing the latest trends, developments and interactions in the real economy; analysing information about the international economy; using accounting principles; formulating and communicating arguments about the state of the national economy; analysing data; using the guidelines of international manuals; using econometrics; applying knowledge of research methodology</i>	42% of all competencies
Macro models	<i>Using knowledge of statistics in this area; using knowledge of micro, macro and monetary economic theory in this area; using knowledge of mathematics in this area; applying knowledge of the role and functioning of the economy in this area; analysing economic variables and building econometric models; analysing data; using statistical tools in macro modelling; using macro models to predict inflation and presenting and motivating research findings by means of well-structured writing skills; conducting research (specifically econometric research)</i>	55% of all competencies
Financial and public finance	<i>Using knowledge of money and banking; using knowledge of statistical principles; using knowledge of economic theory; using knowledge of the role and structure of financial systems and the economy; using knowledge of finance theory and markets; analysing issues related to public finance and its principles; using information about financial markets, financial institutions and instruments; using knowledge of regional and international economic cooperation; using knowledge of international trade and finance; using knowledge of the impact of globalisation on the economy</i>	59% of all competencies
Economic research and report writing	<i>Using knowledge of economic theory, history and political economics; using knowledge of statistics, econometrics and mathematics; using knowledge of the international and domestic economic situation; using knowledge of current economic policy issues and challenges; engaging in economic debate in and outside the organisation; using knowledge of the available data sources; analysing the interrelationships amongst economic variables; reading widely with understanding (e.g. journals and research publications); writing well-structured economic reports; using knowledge of the research process</i>	28% of all competencies
Market operations	<i>Using knowledge of the interaction between the foreign exchange and money markets; using knowledge about local and international markets; analysing and using financial market instruments; analysing the market (demonstrating market intelligence); analysing new systems and strategies to conduct daily operations; liaising with market participants; using knowledge of the systems used in the financial markets function; analysing and applying treasury risk management skills; applying the principles of government funding and finance (micro and macro); defending and motivating policy issues relating to financial markets</i>	31% of all competencies
Treasury operations: Risk management	<i>Using knowledge of the characteristics applicable to the various financial instruments; analysing, integrating and evaluating relevant information about the financial markets; applying quantitative methods; using knowledge of the different treasury products; analysing and calculating the returns on invested instruments and portfolios; analysing financial market instruments and pricing drivers; analysing exposure to risk – predominantly across fixed income; analysing the probability of returns using statistical methods; calculating and interpreting various measurements in the financial markets; calculating and analysing risk-adjusted returns</i>	33% of all competencies
Treasury operations: Accounting and settlement	<i>Using knowledge of treasury systems; using knowledge of accounting principles; using knowledge of the operations of the financial markets (domestic and foreign); using knowledge of payment streams; using knowledge of internal procedures (e.g. settlements); using knowledge of reconciliation; using knowledge of the principles and procedures of banking law; using knowledge of the SWIFT network; using knowledge of operational risks and analysing the use of different financial instruments</i>	19% of all competencies
Reserves management	<i>Analysing, integrating and evaluating relevant information about the financial markets; conducting pricing and analysing of financial market instruments and structures (fixed income); using specific software packages for analytical purposes, for example Bloomberg, Reuters, Finance Kit, Barra and Advanced Excel; using knowledge of economics to evaluate and recommend investment decisions; analysing, integrating and evaluating relevant information about the currency markets; doing quantitative analysis; using analytical and modelling techniques for investment and trading purposes and for portfolio management; applying trading skills; developing and using analytical and modelling techniques for risk management purposes; providing advice on the currency composition of reserves</i>	20% of all competencies
Payments: Oversight	<i>Using knowledge of clearing and settlement processes and procedures; using knowledge of the different payment instruments; using knowledge of new developments in the payment system environment; using knowledge of the banking environment; using knowledge of general accounting; analysing and comparing different payment systems; applying relevant risk management techniques; playing the different roles of a payment system official appropriately (e.g. knowing when you are the regulator, observer, etc.); using knowledge of the payment industry, including the main stakeholders and business interests; using knowledge of collateral and its use in the payment system environment</i>	25% of all competencies
Payment systems: Operations	<i>Using knowledge of payment concepts and the global payment environment; using knowledge of the role and functioning of the financial markets; using knowledge of retail operations; using knowledge of settlement and clearing; using knowledge of accounting principles; using knowledge of the different banking norms; using knowledge of networking (technical networks); analysing risks in payment for oversight (trends); applying information management and processing skills to payment systems; analysing and testing systems</i>	18% of all competencies
Financial stability	<i>Using knowledge about the functioning of the banking system in the economy; using knowledge about econometric analysis and quantitative techniques; analysing and interpreting economic and financial data and graphs; analysing the interaction amongst financial systems; analysing the impact of international economic developments on the domestic economy; collecting, analysing, interpreting, summarising, integrating, evaluating and presenting information on financial stability issues; interpreting bank results and writing reports on this matter; scanning the environment and identifying threats and weaknesses; evaluating possible threats to the financial system and giving reasons why these could impact on financial system stability; evaluating financial systemic matters and giving reasons why certain actions should be taken</i>	21% of all competencies
Bank supervision (legal)	<i>Using knowledge of the business of commercial banking; using knowledge of legal matters obtained through formal legal studies; using knowledge of the components of financial statements (reading these statements); using knowledge of interbank systems; applying the core principles of Basel; applying the principles and procedures of relevant bank legislation; interpreting relevant legislation (e.g. the Banks Act, regulations and procedures); analysing, interpreting and evaluating forensic investigations; analysing exemption notices; overseeing the corporate governance of bank operations</i>	17% of all competencies
Bank supervision (analysts)	<i>Using knowledge of local supervisory and regulatory frameworks; using knowledge of bank legislation pertaining to banks; using knowledge of the international regulatory and supervisory standards; using knowledge of the financial services sector; analysing and interpreting financial ratios; doing trend analysis; evaluating and reporting on risk issues (credit, liquidity, market, operational, interest rates, etc.); applying the Basel core principles; using knowledge of mathematics and statistics for risk management purposes; using knowledge of anti-money-laundering legislation</i>	33% of all competencies
Currency management	<i>Forecasting the demand for banknotes; considering the policy issues surrounding cash and its competitors; setting, monitoring, and maintaining fitness levels for currency in circulation; selecting the appropriate technology for note sorting to meet specific needs; formulating strategy, policy and processes for maintaining the integrity of the currency and for currency planning and issuance; motivating the latest thinking and trends in the provision of currency by a central bank; directing the management of currency integrity and security, including new banknote and coin development and combatting counterfeiting; directing the management of national currency planning and currency issuance; coordinating business continuity planning for the cash industry; liaising with the cash industry at business level</i>	50% of all competencies
Personal mastery	<i>Using knowledge of the business (core functions); developing and implementing business strategies; writing in a well-structured and logical manner; filtering, analysing and interpreting relevant information; delivering high-quality, accurate work outputs on time and according to requirements; conducting research and reporting and motivating findings; paying attention to detail; acting, if necessary, against the way things have traditionally been done; managing time – making good use of time by organising, prioritising and scheduling tasks; managing projects (project management)</i>	15% of all competencies
Interpersonal and team interactions	<i>Building positive and cooperative working relationships amongst team members; demonstrating oral and written communication skills; initiating the activities of groups, and leading others towards common goals; being comfortable with interacting and working with others (interpersonal skills); showing empathy towards others; teaching and coaching others; networking with others inside and outside the organisation; gaining clear agreement and commitment from others through persuasion and negotiation; making business presentations to sell and motivate ideas and proposals; listening attentively</i>	60% of all competencies
Leading others	<i>Developing strategic plans for the business unit aligned to organisational objectives; encouraging training and development in the business unit or department; encouraging team members when the going gets tough; monitoring the work performance of team members against measurable objectives; ensuring that roles, responsibilities and reporting lines are clear and understood by all; gaining clear agreement and commitment from others to achieve work goals; accepting joint responsibility for the team's successes and shortcomings; gathering comprehensive information to support management decision-making; ensuring that knowledge and learning are shared across the organisation – encouraging staff members to learn from one another; giving team members clear direction and support in meeting their objectives</i>	25% of all competencies
Ethics and values	<i>Demonstrating consistency between expressed principles and behaviour; dealing with others in a transparent way; not compromising ethical standards to advance a personal agenda; promoting and defending equal opportunities; treating others with respect and dignity; showing respect for the views and contributions of team members; following through – ensuring that one's promises are realised in behaviour; doing what one said one would do; discouraging gossip amongst team members</i>	13% of all competencies

Note: Text in italics indicates the competencies in which training is mostly offered.

**TABLE 6:** Quantitatively validated global central banker competency model: Relevant competency clusters and training offered.

Competency domains	Overall relevance: Mean scores		
	Overall mean: Highly relevant	Overall mean: Less relevant	≤ 1.5 and ≤ 2.0
Functional and professional specialisation competency domains	<ul style="list-style-type: none"> <li>• Macro models: (most relevant: 100%; training mostly offered: 73%)</li> <li>• Financial stability: (most relevant: 100%; training mostly offered: 21%)</li> <li>• Bank supervision (legal): (most relevant: 92%; training mostly offered: 9%)</li> <li>• Bank supervision (analysts): (most relevant: 100%; training mostly offered: 33%)</li> </ul>	<ul style="list-style-type: none"> <li>• National economy: (most relevant: 92%; training mostly offered: 38%)</li> <li>• Financial and public finance: (most relevant: 100%; training mostly offered: 59%)</li> </ul>	<ul style="list-style-type: none"> <li>• Economic research and report writing: (most relevant: 100%; training mostly offered: 28%)</li> <li>• Market operations: (most relevant: 94%; training mostly offered: 31%)</li> <li>• Treasury operations: Risk Management: (most relevant: 94%; training mostly offered: 38%)</li> <li>• Treasury operations: Accounting and settlement: (most relevant: 100%; training mostly offered: 19%)</li> <li>• Reserves management: (most relevant: 71%; training mostly offered: 15%)</li> <li>• Payment systems — Oversight: (most relevant: 86%; training mostly offered: 25%)</li> <li>• Payment systems — Operations: (most relevant: 85%; training mostly offered: 23%)</li> <li>• Currency management: (most relevant: 61%; training mostly offered: 55%)</li> </ul>
Enabling competency domains	-	<ul style="list-style-type: none"> <li>• Personal mastery: (most relevant: 81%; training mostly offered: 17%)</li> <li>• Interpersonal and team interaction: (most relevant: 63%; training mostly offered: 44%)</li> </ul>	-
Leadership or management competency domain	-	<ul style="list-style-type: none"> <li>• Leading others: (most relevant: 80%; training mostly offered: 26%)</li> </ul>	-
Ethical competency domain	-	<ul style="list-style-type: none"> <li>• Ethics and values: (most relevant: 75%; training mostly offered: 0%)</li> </ul>	-

Table 6 shows that the overall mean scores of the majority of the competency domains fell between 1.50 and 2.00. This indicates that the respondents scored the competency domains mostly as either being of very high relevance or high relevance. On average, none of the domains was scored as having a low relevance or very low relevance. The respondents scored the competency domains macro models, financial stability, bank supervision, legal and bank supervision (analysts) at the highest levels of relevance of all the competency domains. The average mean score for the relevancy of competency domains was 1.46. Regarding the functional and professional specialisation cluster, most of the respondents regarded the proposed competencies making up the respective competency domains as most relevant, with an average of 91% across all of these competencies. Training was provided in, on average, 33% of all of the competencies, not only the relevant ones included in this cluster.

For the enabling competency cluster, most of the respondents (average of 72%) regarded the proposed competencies making up the respective competency domains as most relevant, with an average of 31% of all of the competencies in which training is being offered. The average mean score for the relevance of these competencies was 1.74. In the case of the leadership or management competency cluster, most of the respondents (an average of 80%) regarded the proposed competencies making up the respective competency domains as most relevant. Training was being given in, on average, 26% of all of the competencies. The average relevancy means score was 1.73.

With respect to the ethical competency cluster, most of the respondents regarded the proposed competencies making up the respective competency domains as most relevant, with an average of 75%. The average mean score for the relevance of these competencies was 1.57. All of the respondents (100%) regarded the 'training least offered' category as relevant to this cluster.

### Presence of a global central banker competency model and the training offered and a central bank's global influence

The testing of the study hypotheses, namely that the presence of a comprehensive, integrated GCBCM, and the training offered in terms of this model, do affect the global influence of a central bank, are discussed next.

Table 7 presents the results of the hypothesis testing regarding the presence of a comprehensive, integrated GCBCM in relation to the global influence of a central bank.

Table 7 shows that significant differences in level of global influence were found in the case of two competency domains: (1) bank supervision (analysts) ( $p \leq 0.01$ ) and (2) currency management ( $p \leq 0.05$ ).

Table 8 shows the results of the hypothesis test of the relationship between the degree of global influence and the training offered by a central bank.

Table 8 shows that significant differences were identified in the levels of global influence of a central bank and the training offered. Higher global influence central banks offer significantly more training in the following competency domains: (1) macro models, (2) financial and public finance, (3) treasury operations (accounting and settlement), (4) reserves management, (5) payment systems (operations), (6) currency management and (7) ethics and values. Bank supervision (legal) was borderline in terms of significance.

### Evaluating the quantitatively validated global central banker competency model

The researchers co-assessed, as objectively as possible, the GCBCM against the evaluation criteria proposed in Figure 1, in a first attempt to test the robustness of the model. Ideally speaking, one should solicit an independent evaluation by multiple assessors or a panel of assessors to evaluate the GCBCM. This not having been done can be regarded as a limitation of the study, as well as an area for future research.

**TABLE 7:** Hypothesis testing: The level of global influence with respect to the competency model in use – results of the Mann-Whitney *u*-test.

Competency domains	Global influence categories	N	Mean	Standard deviation	Test statistics	
					Mann-Whitney	p-value
National economy	Lower global influence	10	1.38	0.28	-	-
	Higher global influence	12	1.63	0.42	42.5	0.24
	Total	22	-	-	-	-
Macro models	Lower global influence	10	1.28	0.33	-	-
	Higher global influence	12	1.44	0.58	55.5	0.75
	Total	22	-	-	-	-
Financial and public finance	Lower global influence	10	1.41	0.33	-	-
	Higher global influence	11	1.64	0.50	41.5	0.34
	Total	21	-	-	-	-
Economic research and report writing	Lower global influence	10	1.51	0.47	-	-
	Higher global influence	12	1.4	0.38	50.5	0.52
	Total	22	-	-	-	-
Market operations	Lower global influence	9	1.62	0.40	-	-
	Higher global influence	11	1.56	0.44	42.5	0.59
	Total	20	-	-	-	-
Treasury operations – risk management	Lower global influence	10	1.67	0.32	-	-
	Higher global influence	12	1.68	0.66	49.5	0.48
	Total	22	-	-	-	-
Treasury operations – accounting and settlement	Lower global influence	10	1.67	0.49	-	-
	Higher global influence	10	1.54	0.42	43	0.59
	Total	20	-	-	-	-
Reserves management	Lower global influence	10	1.93	0.62	-	-
	Higher global influence	11	1.57	0.54	37.5	0.21
	Total	21	-	-	-	-

**TABLE 8:** Hypothesis testing: Degree of global influence and training offered: Results of Pearson's chi-squared test.

Competency domains	Global influence categories	N	Offer training to develop this competency (%)		Pearson chi-squared value	Degrees of freedom	Exact significance (one-sided p-value)
			Yes	No			
National economy	Lower global influence	12	37.5	71.4	2.24	1	0.13
	Higher global influence	11	62.5	28.6			
	Total	23	-	-			
Macro models	Lower global influence	11	35.3	83.3	4.1	1	0.04
	Higher global influence	12	64.7	16.7			
	Total	23	-	-			
Financial and public finance	Lower global influence	11	35.7	85.7	4.67	1	0.03
	Higher global influence	10	64.3	14.3			
	Total	21	-	-			
Economic research and report writing	Lower global influence	11	36.4	58.3	1.11	1	0.29
	Higher global influence	12	63.6	41.7			
	Total	23	-	-			
Market operations	Lower global influence	10	33.3	63.6	1.81	1	0.17
	Higher global influence	10	66.7	36.4			
	Total	20	-	-			
Treasury operations (risk management)	Lower global influence	11	38.5	75.5	2.65	1	0.1
	Higher global influence	10	61.5	25			
	Total	21	-	-			
Treasury operations (accounting and settlement)	Lower global influence	11	30.0	72.7	3.83	1	0.05
	Higher global influence	10	70.0	27.3			
	Total	21	-	-			
Reserves management	Lower global influence	10	35.7	83.3	3.81	1	0.05
	Higher global influence	10	64.3	16.7			
	Total	20	-	-			
Payment systems (oversight)	Lower global influence	10	40.0	66.7	1.22	1	0.26
	Higher global influence	11	60.0	33.3			
	Total	21	-	-			
Payment systems (operations)	Lower global influence	11	25.0	88.9	8.41	1	0.01
	Higher global influence	10	75.0	11.1			
	Total	21	-	-			
Financial stability	Lower global influence	10	40.0	66.7	1.35	1	0.24
	Higher global influence	9	60.0	33.3			
	Total	19	-	-			
Bank supervision (legal)	Lower global influence	7	20.0	62.5	3.37	1	0.06
	Higher global influence	11	80.0	37.5			
	Total	18	-	-			

Nevertheless, the researchers are of the opinion that the GCBCM can be regarded as the most suitable competency model for central bankers globally.

Contrary to the two currently available central banker competency models discussed, the GCBCM: (1) indicates the required level of proficiency, (2) clearly links roles, competencies and outputs, (3) shows that the included competencies are meaningful and form a logical whole, (4) defines all of the competencies in behavioural terms, making them measurable, and, because central bankers themselves identified and prioritised the competencies, (5) is a highly authentic model.

## Discussion

### Finding 1: A globally validated global central banker competency model

The majority of the competencies included in the GCBCM were regarded as relevant by the respondents. This confirms the validity of the GCBCM because, firstly, subject matter experts were used for identifying the competencies in the focus groups in one central bank (Phase 2: The qualitative research approach) and, secondly, the same competencies were subsequently validated by other subject matter experts globally (Phase 3: The quantitative research approach).

With regard to the reliability of the questionnaire used to validate the competencies, the reliabilities obtained were excellent for a newly developed questionnaire. This may be ascribed to the tightly defined or closely related competencies in each of the competency domains, as was confirmed by the focus groups, as well as the high number of items per competency domain.

### Finding 2: Independent hard and soft competency dimensions

Central banks seem to place greater emphasis on the development of hard competencies than soft competencies. One reason could be that they regard themselves as essentially technocratic organisations. However, the researchers believe that soft competencies are becoming increasingly important in building healthy personal and interpersonal relationships in the workplace and engendering high levels of employee engagement.

### Finding 3: No differentiation of competencies in terms of levels of work

It is evident from the findings that central banks are not structured in terms of levels of work, and do not differentiate competencies according to these levels. By implication, they treat all competencies the same, regardless of variations in the requisite complexity across organisational levels. One implication could be that, if central banks do not differentiate according to levels of work and train and develop employees accordingly, their employees will not be able to contribute at the requisite level of complexity.

One could postulate that central banks, due to the increasingly pivotal role they are playing in national and international economies, should, at the governor level at least, operate at Level of Work 6 (corporate citizenship), where the role of the organisation is seen within an international context, and in some cases, like the Federal Reserve System of the USA and the European Central Bank, at Level of Work 7 (global prescience). In this case, the organisation affects a sector's design and functioning. If central banks at the highest level of work only operate at Level of Work 5 (strategic intent), they would predominantly pursue parochial, national interests, with limited regard for their global impact.

### Finding 4: Differences between central banks with higher and lower global influence according to the global central banker competency model

Significant differences were found in only two competency domains between central banks with respectively higher and lower levels of global influence: (1) bank supervision (analysts) and (2) currency management. Inversely, these results imply that the respondents in all of the central banks, regardless of their global influence, viewed the majority of the competency domains as relevant.

The significant difference in bank supervision in central banks with a higher global influence, however, is in stark contrast to what happened in practice with the bank failures that occurred in the USA and certain European countries during the 2008/2009 financial crisis. One would have thought that, in these countries, adequate and proactive measures through effective bank supervision or regulation would have been taken to counteract bank failures.

As regards currency management, various high-profile global incidents emphasised that it is important for central banks to have carefully considered and tested strategies to deal with shortages of cash due to anything from supplier problems to natural disasters. If central banks do not forecast the demand for banknotes and coins correctly, it could lead to a shortage of cash in circulation.

In conclusion, although significant differences were found between central banks with a higher and lower global influence in terms of relevance in two competency domains, namely bank supervision (analysts) and currency management, one can state with confidence that the competency model is generally valid across all central banks, regardless of their global influence.

### Finding 5: The training offered by central banks

A concern is that the responding central banks worldwide generally offer limited training to their staff members. From the findings, it is furthermore evident that central banks place a much greater emphasis on hard competencies than on soft competencies. This is worrying, because it is no longer good enough for central banks to have only highly competent technical experts, given their changing role. They

need the right people in the right jobs, who are fully engaged. Given the fierce global war for talent, soft competencies may just be the key differentiator in making one's organisation an employer of choice.

### **Finding 6: Comparing the training offered by central banks with a higher and lower global influence**

Significant differences were found between the training offered by central banks with a high global influence and those with a low influence, in the following seven competency domains: (1) macro models, (2) financial and public finance, (3) treasury operations (accounting and settlement), (4) reserves management, (5) payment systems (operations), (6) currency management and (7) ethics and values. Bank supervision (legal) was border line in terms of significance.

Of all the above mentioned competency domains, it is interesting to note that macro models (73%), financial and public finance (59%), and currency management (55%) were the competency domains in which all of the central banks offer most of their training. This means that central banks with both a higher and lower global influence regard these competency domains as critical areas.

What is also interesting is that the competency domain ethics and values is the only soft competency domain appearing amongst the hard competency domains. Central banks have a central position in the economy. Therefore, central banks should lead by example in terms of sound corporate governance and business ethics.

An important implication for central banks with a lower global influence is that they could rightfully ask why central banks with a higher global influence provide more training in the seven competency domains mentioned above.

In summary, *firstly*, there was no quantitatively validated GCBCM prior to conducting this study. The value of this study is that central banks now have a GCBCM, which could become an aspirational and benchmark model for central banks. *Secondly*, central banks should make a concerted effort to offer more training to their employees, and also give greater attention to developing the soft competencies. *Thirdly*, if central banks do not train their employees to meet the complex requirements of levels of work, central banks may not be able to make their expected contribution, nationally and globally.

### **Conclusion**

From a theoretical value-add point of view, the study provided an updated, comprehensive process for competency modelling, with the criteria for assessing the robustness of the model produced. Methodologically, the value added by the study lies in the provision of two new validated and reliable questionnaires that are available to determine: (1) the relevance of competencies in the GCBCM and (2)

whether training is provided to develop these competencies. Practically, the value added by the study is that it reflects the current thinking amongst central bankers globally about what constitutes a competent central banker.

The study has several strengths. Firstly, through a comprehensive literature review, a sound foundation was laid for the empirical research. Secondly, the blended research design helped the researchers to obtain richer data, because different data sources were used, and, through triangulation, this multi-method approach added to the richness of the study. Thirdly, because the researchers could integrate the data obtained from both qualitative and quantitative research, more reliable and complete competency survey questionnaires with high levels of internal consistency (reliability) could be constructed. Fourthly, because a high percentage of the respondents (33%) had 21 or more years of service in a central bank, good quality data could be collected. Finally, the relatively high level of global participation by central banks makes it possible to generalise the research results to central banks worldwide.

The weaknesses of the study are, firstly, that the classification of central banks into the higher and lower global influence categories was taxing, because information on their global influence and reputation is scanty. The researchers were forced to rely on only two sources of information, although both were reliable. The 20 major economies in the world were used as the primary data source for central banks with a higher global influence. A cross-validation of level of influence through a review of journal articles and the Internet served to corroborate the primary data source. Secondly, the study was limited by non-participation of a number of major central banks. Thirdly, due to the relatively small sample size, the research was restricted to the use of non-parametric statistics, which are less powerful than inferential statistics. Lastly, the researchers did not use an independent panel to assess the GCBCM against the evaluation criteria.

Future research opportunities are as follows: firstly, to conduct an independent evaluation using multiple assessors to determine the extent to which the GCBCM meets the evaluation criteria; secondly, to differentiate the GCBCM in terms of levels of work; thirdly, to select a larger sample so that: (1) factor analysis can be applied to the questionnaires, in order to determine the underlying factorial structure, and (2) a cluster analysis may be performed, to classify central banks in terms of the competency models applied by them, and in this way determine whether it would make sense to differentiate central banks by their degree of global influence, or according to the competency model used by them; fourthly, to assess if the GCBCM can be incorporated into all facets of the people management. If so, whether people management would be done differently; lastly, to investigate why central banks offer so little training in developing competencies, particularly soft competencies.

It is believed that this study has made a significant contribution to providing a GCBCM that could be used by central banks.

Additionally, the study contributed to the wider body of knowledge regarding competencies, competency models and competency modelling.

## Acknowledgement

### Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

### Authors' contributions

T.H. (University of Johannesburg) was the supervisor of the study and provided input. D.W. (University of Johannesburg) performed most of the research and prepared the samples and calculations with the assistance of Statkon at the University of Johannesburg. The article was jointly prepared by both authors.

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