

THE INTERPLAY BETWEEN NATIONAL CULTURE AND DIFFUSION OF ACTIVITY-BASED COSTING: AN ASIA-PACIFIC PERSPECTIVE

Bülend Terzioglu

Elsie S. K. Chan

School of Business

Australian Catholic University, Australia

ABSTRACT

This paper provides an updated overview of the state of activity-based costing (ABC) and time-driven activity-based costing (TDABC) research in selected Asia Pacific countries and describes the association between national culture and ABC implementation. We reviewed literature on ABC and TDABC relating to selected Asia Pacific countries from 42 academic and professional journals published in the period 1987-2012. Our findings show substantial divergence in ABC implementation rates. In this study, we have not identified any research on TDABC in Asia Pacific countries that has been published. Opportunities exist for more extensive studies of ABC and TDABC that take account of Asia Pacific national cultures.

Keywords: Activity-based costing, Asian culture, diffusion of innovation, Asia pacific, Hofstede

INTRODUCTION

The Chartered Institute of Management Accountants (CIMA, 2008, p.3) defines activity-based costing (ABC) as “an approach to the costing and monitoring of activities which involves tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilizes cost drivers to attach activity costs to outputs.” Interestingly, strong academic and practitioner interest in ABC in the early years of its introduction

was followed by a period of decline. In the early 1990s Robert Kaplan, who introduced ABC, admitted that it had reached a stagnation point and suggested that it was time to replace it with time-driven activity based costing (TDABC), which is purportedly capable of rectifying the major stumbling blocks of ABC by providing accurate costing per time unit for processes and determining the time required to perform activities. Kaplan and Anderson (2007) developed the TDABC system to replace ABC, and reported about two hundred successful TDABC implementations in the USA. TDABC was devised to address not only the pitfalls which might have been responsible for the slow take-off of ABC but also to improve accuracy of cost information, and provide information regarding profitability of orders, products and customers. Despite Kaplan and Anderson's (2007) assurances, some researchers (Cleland, 2004; Adkins, 2008; Cardinaels and Labro, 2008) argued that TDABC was far from perfect and cautioned that the true measurement error could be problematic in TDABC. Similarly, Hoozée et al. (2012) found that collective worker participation and appropriate leadership styles were indispensable for operational improvements to emerge during the design and operation of TDABC systems. The topic is of interest given there is broad agreement that ABC is a conceptually sound system, but judging from implementation rates it seems to have failed to gain popularity among majority of firms. On the other hand, the paucity of case-based research in this area obstructs identification of factors that have been impeding its growth; the few existing empirical results are mixed with respect to TDABC's performance on cost control, competitiveness, quality of information for decision-making and profitability.

Empirical research suggests that accountants differ in their attitude towards considering management accounting innovations and taking initiatives for the improvement of strategic decision-making processes (Hopper, 1980; Emsley, 2005). In particular, Brewer (1998) pointed out the lack of ABC studies that consider cultural environment. In addition to firm characteristics and needs, Naranjo-Gill et al. (2009) found that willingness and ability of the chief financial officer to recognise the need for innovation and initiate the administrative change determine their propensity to implement innovations. These empirical findings lend support to the notion that the individual characteristics of people involved in decisions regarding management accounting innovations cannot be ignored. Unfortunately, there is a dearth of research into cultural factors that

underlie control systems. Otley (2003) argued that individuals are affected by a range of cultural differences beyond those of the nation in which they were brought up, or in which they currently work. Baird et al. (2004) found that culture is a strong determinant of the extent of ABC adoption. Outcome orientation and tight versus loose control were found to be important for all three levels of activity management (i.e. activity analysis, activity cost analysis and activity-based costing). Having an innovative culture was strongly associated with the activity analysis and activity cost analysis. On the contrary, Baskerville (2003) opposed cross-national accounting studies based on Hofstede's cultural measurement which she blamed for misleading dependence on cultural indices as an exploratory variable of differences in accounting practices and behaviour. Despite its critics, Hofstede remains a seminal work in cultural studies; therefore, we decided to use Hofstede's work as a basis of this study while acknowledging its limitations.

Our study, although preliminary, is timely in that it highlights the issues associated with ABC research in selected Asia Pacific countries. Current knowledge about the state of ABC in Asia Pacific countries is fragmented and most of the prior studies relating to national culture's impact on ABC implementation are scant and survey-based. Accordingly, this article has three specific objectives: (1) to ascertain the state of ABC and TDABC with respect to adoption rates by Asia Pacific countries, (2) to find out if TDABC has made any inroads in Asia Pacific countries, and (3) to provide a comparative cultural analysis of the countries being examined in association with ABC research. A unique feature of our study is that it focuses exclusively on ABC/TDABC research in selected Asia Pacific countries by incorporating cultural traits as they apply to ABC implementation. We acknowledge that this study has only scratched the surface of this complex phenomenon. Nevertheless, it is hoped that our study will spur investigation into ABC and TDABC in this fast-growing part of the world, and assist researchers by providing a platform for further culture-related research.

The outline of this article is as follows. The next section describes the methodology, and is followed by a discussion of results. Then conclusions and suggestions for further research are presented. In the final section we discuss the limitations of our study.

METHODOLOGY

The literature search was conducted in six phases:

1. Selection of countries;
2. Selection of timeframe;
3. Identification of journals and databases for the literature search;
4. Search for articles to include in the review;
5. Consensus between the authors on which articles to include and classification of papers; and
6. Analysis of articles.

Selection of Countries

According to the Asia-Pacific Economic Cooperation forum (APEC, 2013), Asia-Pacific countries are: Australia, Brunei Darussalam, Chile, People's Republic of China (PRC), Hong Kong, China (Hong Kong), Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, The Philippines, Russia, Singapore, Chinese Taipei (Taiwan), Thailand, The United States (USA) and Vietnam. This study, however, focuses exclusively on Australia, Hong Kong, Japan, Malaysia, New Zealand, People's Republic of China (PRC), Singapore, Taiwan and Thailand. This selection was purposive and subjective, made on the basis of the authors' areas of interest, availability of literature and the countries' economic relevance to Australia.

Period

Given that ABC was introduced in the mid-1980s, and the first academic outputs began to appear in 1987; we decided to cover the period from 1987 to 2012.

Identification of Journals and Databases

As this study focuses on the Asia Pacific region, we included the major Asian accounting journals. For a broader coverage we also included all international management accounting journals and a selection of other accounting journals. Although publications focusing on ABC/TDABC typically appear in accounting journals, it is not uncommon to find such

articles in non-accounting journals. Finally, two hybrid journals were included, which brought the number of journals reviewed to forty-two.

Table 1: Journals Reviewed for the Time Period 1987-2012

Journal*	Journal*
<i>Accountancy</i> (0)	<i>International Journal of Managerial and Financial Accounting</i> (1)
<i>Accounting, Auditing & Accountability Journal</i> (0)	<i>International Journal of Production Economics</i> (6)
<i>Accounting & Business Research</i> (0)	<i>Journal of Accountancy</i> (0)
<i>Accounting & Finance</i> (3)	<i>Journal of Accounting & Organizational Change</i> (1)
<i>Accounting Forum</i> (1)	<i>Journal of Accounting, Auditing and Finance</i> (0)
<i>Accounting Horizons</i> (0)	<i>Journal of Accounting Literature</i> (0)
<i>Accounting, Organizations & Society</i> (2)	<i>Journal of Accounting and Economics</i> (0)
<i>Accounting Research Journal</i> (4)	<i>Journal of Accounting Research</i> (0)
<i>Accounting Review</i> (0)	<i>Journal of Applied Management Accounting Research</i> (6)
<i>Advances in Management Accounting</i> (0)	<i>Journal of Business Finance & Accounting</i> (0)
<i>Asia Pacific Journal of Accounting and Economics</i> (0)	<i>Journal of Corporate Accounting & Finance</i> (0)
<i>Asia Pacific Management Accounting Journal</i> (2)	<i>Journal of Cost Management</i> (6)
<i>Asian Journal of Banking and Finance</i> (0)	<i>Journal of Management Accounting Research</i> (0)
<i>Asian Review of Accounting</i> (8)	<i>Journal of Modern Accounting and Auditing</i> (0)
<i>Behavioral Research in Accounting</i> (1)	<i>Journal of Performance Management</i> (1)
<i>British Accounting Review</i> (4)	<i>Malaysian Accounting Review</i> (2)
<i>Contemporary Accounting Research</i> (0)	<i>Management Accounting Quarterly</i> (1)
<i>Critical Perspectives on Accounting</i> (1)	<i>Management Accounting Research</i> (6)
<i>European Accounting Review</i> (0)	<i>Managerial Auditing Journal</i> (3)
<i>Financial Management London [Management Accounting (UK)]</i> (1)	<i>Pacific Accounting Review</i> (0)
<i>International Journal of Accounting</i> (5)	<i>Strategic Finance [Management Accounting (US)]</i> (0)

*The number of ABC/TDABC related articles found in each journalist shown in parentheses.

Selection and Classification of Articles

We targeted articles germane to ABC and TDABC as well as articles dealing with ABC implementation and/or cultural aspects of adoption of management accounting innovations (including ABC) in the selected countries. We considered theoretical, empirical and conceptual papers. The full text of each article was read, and those which are not directly related to ABC/TDABC were excluded. To check for missing literature, we searched the ProQuest ABI/Inform Complete database using the following keywords and entered them into Google Scholar:

1. Activity-based costing;
2. ABC;
3. ABC+Australia, ABC+China, ABC+Hong Kong, ABC+Japan, ABC+Malaysia, ABC+New Zealand, ABC+Singapore, ABC+Taiwan, ABC+Thailand;
4. Time-driven activity-based costing; and
5. TDABC+Australia, TDABC+China, TDABC+Hong Kong, TDABC + Japan, TDABC+Malaysia, TDABC+New Zealand, TDABC+Singapore, TDABC+Taiwan, TDABC+Thailand.

RESULTS AND DISCUSSION

Our search of the broad cross-section of journals listed in Table 1 and the ProQuest search yielded 65 usable documents with 12 papers excluded. Details of those articles are listed in Appendix 1. The distribution of articles by country of focus is presented in Table 2. Table 1 provides a breakdown of papers per journal. It is acknowledged that researchers' inability to access Japanese and Chinese-language accounting journals limited comprehensive coverage of ABC in Japan and China. In reference to ABC research in Japan, Ozawa and De Zoysa (2013) examined the three major accounting journals – *Kaikei*, *Sangyo-keiri* and *Kigyo-kaikei* – during 1988-1999 and reported that the annual number of articles with ABC in their title fluctuated between five and nine, with a decline towards the end of the period.

Table 2: Distribution of ABC and TDABC-related articles in each country

Country	Australia	China (PRC)	Hong Kong	Japan	Malaysia	New Zealand	Singapore	Taiwan ROC	Thailand
Number of articles*	21	11	3	3	12	9	4	3	1

* Total number of articles exceeds 65 as some cover more than one country.

In terms of numbers of ABC and TDABC-related articles published, Australia leads the way closely followed by Malaysia and the PRC. The numbers of papers focusing on other countries are relatively small. Note that while ABC uptake in Japan is much smaller than in other developed countries, this should not necessarily mean that they do not publish in this area. For example Japanese and Chinese researchers have their own accounting journals published in their own language.

The scatter plot in Figure 1 displays ABC publication numbers in our selected journals and time period. Evidently, the number of papers published peaked in 1997 and 2007, but has since declined.

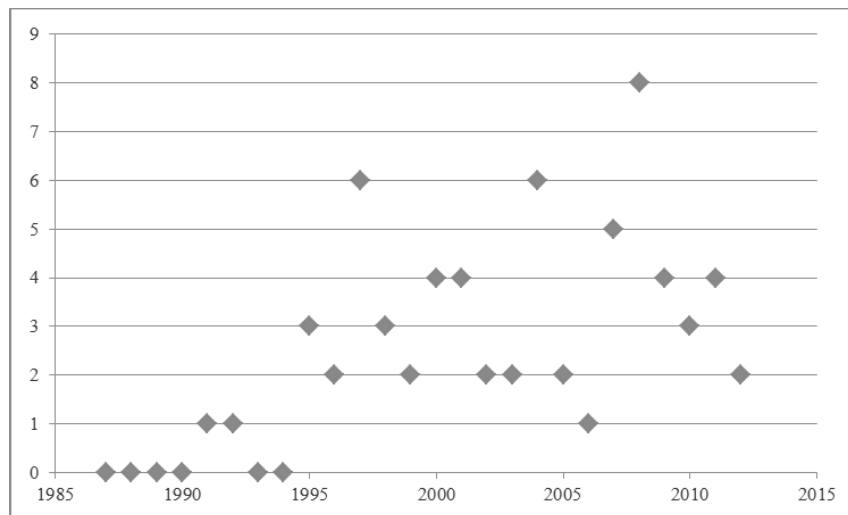


Figure 1: Number of ABC/TDABC articles published per year 1987-2012

Implementation Rates

One of the topical issues around ABC is its slow take up. Table 3 presents adoption rates per country. It is striking that adoption rates are extremely varied, and even differ in surveys carried out in the same year. In reference to Takahashi's study, Nishimura (2005) reports that most Japanese businesses prefer to use traditional management accounting and adoption of ABC (8.9%) is rather rare. Lee et al. (1994) attribute the unpopularity of ABC in Japan to the preference for standard costing systems for costing and relatively heavier reliance on nonfinancial measures. Lee et al. (1994) also indicate that Japanese cost management systems focus on measuring short-term progress on product and process improvement, which ABC cannot provide. Save for Smith et al. (2008); implementation rates for Malaysia are comparatively consistent and show a strong upwards trend since 1998. Significantly different usable response rates might be partly responsible for the difference in implementation rates in the years 2007 to 2009. Adoption rates for New Zealand are similar to Australia's and consist of blips without a clear pattern. Only three studies of ABC implementation in the PRC exist; and those for Singapore are dated. Figures for Thailand are reasonably consistent and show an upward trend in implementation since 2002.

Table 3: Comparison of ABC adoption rates in the Asia Pacific Region

Author/s (year)	Sample characteristics (usable responses)	Extent of ABC adoption	Research location
Aldukhil (2012)	Manufacturing and nonmanufacturing firms (108)	28.7%	Australia
Askarany et al. (2012)	Management accountants (310)	57.1%	Australia
James and Elmezughi (2010)	Manufacturing & nonmanufacturing (199)	14.3%	Australia
Askarany & Smith (2007)	Manufacturing firms in plastics industry (47)	13.7%	Australia
Baird et al. (2007)	Hospitals, universities, government agencies & government business enterprises) (122)	Public: 34.4% to a great extent 31.9% to a moderate extent Private: 41.9% to a great extent 36.2% to a moderate extent	Australia
Reeve and Warwick (2006)	CPAs working at both manufacturing & nonmanufacturing (166)	48.0%	
Xydias-Lobo et al. (2004)	CPAs from South Australia working in manufacturing, public service, financial services, education and community services (161)	31.1%	Australia
Preda and Watts (2004)	Manufacturing (62) and nonmanufacturing (226)	58.1% Manufacturing 47.8% Nonmanufacturing	
Baird et al. (2004)	Business units -400 firms with more than 50 employees (246)	41.9% to a great extent 36.2% to a moderate extent	Australia
Chenhall and Langfield-Smith (1998)	Manufacturing firms (78)	56.0%	Australia

Author/s (year)	Sample characteristics (usable responses)	Extent of ABC adoption	Research location
Booth and Giacobbe (1997)	Manufacturing firms (213)	12.0%	Australia
Nguyen and Brooks (1997)	Manufacturing firms (120)	12.5%	Australia
Warwick et al. (1997)	Manufacturing firms (49)	10.0%	Australia
Clarke and Mia (1995)	Largest manufacturing companies (not reported)	13.0%	Australia
Chen et al. (2001)	Manufacturing and nonmanufacturing firms (90)	11.1%	Hong Kong
Takahashi (2003)	Not reported	8.9%	Japan
Wijewardena and De Zoysa (1999)	Manufacturing firms - Japan (217) Manufacturing firms - Australia (231)	2.0% (Japan) 23.0% (Australia)	Japan & Australia
Sakurai (1992)	Manufacturing firms (157)	6.4%	Japan
Ahmad and Zabri (2012)	SME manufacturing firms (160)	44.0%	Malaysia
Azhar and Abdul Rahman (2009)	Public institutions of higher education (15) Private institutions of higher education (17)	20.0% 47.1%	Malaysia
Smith et al. (2008)	Manufacturing firms (30)	23.0%	Malaysia
Maelah and Ibrahim (2007)	Manufacturing firms (108)	36.1%	Malaysia
Isa and Thye (2006)	Manufacturing firms (75)	28.0%	Malaysia
Isa and Foong (2005)	Manufacturing firms (122)	23.0%	Malaysia
Omar et al. (2003)	Manufacturing firms (387)	17.2%	Malaysia
Sithambaram (2002)	Manufacturing firms (not reported)	6.5%	Malaysia

Author/s (year)	Sample characteristics (usable responses)	Extent of ABC adoption	Research location
Abdul Rahman et al. (1998)	Manufacturing firms	4.0%	Malaysia
Askarany et al. (2012)	CIMA members (142)	40.0%	New Zealand
Cotton et al. (2003)	Chartered accountants in commercial firms, local government organizations, not-for-profit organizations and state-owned enterprises (224)	Manufacturing: 25.5% Non-manufacturing: 18.8%	New Zealand
Lamminmaki and Drury (2001)	Large manufacturing firms (85)	5.0% (a further 12% intending and 32.0% considering)	New Zealand
Hoque (2000)	Manufacturing firms (71)	Automated companies: 38.0% Non-automated companies: 42.0%	New Zealand
Adler et al. (2000)	Manufacturing firms with more than 20 employees (165)	19.4% (a further 4.8% indicating that it is being installed)	New Zealand
Xiong et al. (2008)	Manufacturing firms (127)	7.1%	PRC
Feng (2002)	Chinese firms (118)	29.6%	PRC
Firth (1996)	Foreign firms (535), Joint ventures (456), Chinese partners (432)	Foreign firm: 6.7-9.2% Joint venture: 6.8-11.2% Chinese partner: 2.8-4.6%	PRC
Ghosh and Chan (1997)	Manufacturing firms (39) and Nonmanufacturing firms (70)	13.0%	Singapore
Chung et al. (1997)	Manufacturing (not reported)	4%-21%	Singapore
Schoch et al. (1994)	Electronics firms (82) Electronics & food processing firms (300)	21.0% 8.0%	Singapore

Author/s (year)	Sample characteristics (usable responses)	Extent of ABC adoption	Research location
Sengphanich (2007)	Manufacturing firms (204)	25.0%	Thailand
Ruttaporn (2005)	Manufacturing firms (80)	22.6%	Thailand
Chongruksut (2002)	Manufacturing and nonmanufacturing firms (101)	11.9%	Thailand
Phadoongssitthi (2002)	Manufacturing (60) and nonmanufacturing firms (19)	Manufacturing: 20.0% Nonmanufacturing: 35.0%	Thailand

Why are survey findings so confusing? Reasons that underlie such a significant dispersion in results should be addressed in future studies. Such contradictory findings adversely affect the reliability of academic work and hinder our ability to draw meaningful conclusions. As stated in the literature, differences may well stem from the lack of clarity with respect to what constitutes ABC implementation. Other factors such as whether questions pertinent to levels of implementation are included should be investigated. In the literature there is no universal definition of ABC adoption. For example, ABC adoption can refer to firms which are *currently using* ABC (Brown *et al.*, 2004; Innes and Mitchell, 1995), but for others ABC adoption is defined as firms that are already *using, implementing or intending* to use ABC (Al-Omiri and Drury, 2007) and firms that *implemented ABC after adopting it* (Gosselin, 1997). Krumwiede (1998) and Brierley (2011) suggested defining non-adopters first, and considering those outside this definition as adopters. Non-adopters include firms that are not using ABC but have considered using it, those that are not using ABC but have considered using it (excluding those that are intending to use it), and firms that have rejected ABC and have not used ABC previously or do not use any ABC principles. Therefore, caution should be exercised in comparing adoption rates reported in various studies because some studies consider adoption in three levels which consist of activity analysis, activity cost analysis and activity-based costing (e.g., Gosselin, 1997; Baird *et al.*, 2007). In addition, managers are more likely to report that their firms are using ABC when they are not than the reverse; therefore ABC implementation rates found in surveys are upwardly biased (Lukka and Granlund, 2002). Furthermore, Drury and

Tayles (2005) pointed out that the surveys which allow respondents to self-specify whether their organisations operated an ABC system rarely include suitable control questions. Future research should take these methodological points into consideration.

Kaplan and Anderson (2004) devised TDABC as an improved version of ABC, which is purportedly simpler, cheaper, more flexible and easier to maintain. Interestingly, we could not identify a paper dealing with TDABC in the Asia Pacific region. The only known TDABC study was conducted on Sri Lanka, which was not included in our review as it is not an Asia-Pacific nation. Ratnatunga et al. (2012) conducted a case study at a listed manufacturing company in Sri Lanka and compared the results of ABC and TDABC implementation. They found that no difference existed between ABC and TDABC when standard activity times were used as cost drivers. In contrast to Hoozée et al. (2012) who reported that TDABC was increasingly accepted, Ratnatunga et al. (2012) predicted that fewer companies will implement TDABC than have implemented ABC.

Role of National Culture on the Adoption and Implementation of ABC and Hofstede's Cultural Framework

Asia Pacific is comprised of nations with distinct cultures, and in addition, several cultures can exist within one national culture. For example, Lawler et al. (1997) suggested that there is not a single Thai management style but rather Thai and Thai-Chinese versions, with additional bureaucratic influences coming from state-owned corporations and foreign influences. While Cooper et al. (1992) proposed that managers must use data from the ABC system for decision-making, Argyris and Kaplan (1994) recounted the reluctance of some senior operating managers to act upon the relative cost and profitability information furnished by the ABC system. An analysis of factors influencing the success of ABC implementation and problems being encountered by firms during implementation (difficulty in promoting ABC to staff, top management support, linking ABC to performance appraisal, user attitudes, etc.) reveals the embedded cultural element in such behaviours. Shields and Young (1989) argued that resistance to ABC adoption and implementation can be minimized once each of the following components influencing success of ABC systems can be managed properly: top managers championing the ABC project, providing staff with adequate ABC training,

encouraging cross-functionality and team orientation, linking activity-based and team-oriented metrics to employee compensation, delegating decision making to front line workers and adopting a long-term view of the benefits from ABC. In their study of the impact of national culture on budget control practices in the USA and Japan, Ueno and Wu (1993) found that individualism/collectivism was the key differentiating factor for the budget control practices in the two countries (i.e., communication and coordination, budgetary slack, controllability, short-term versus long-term performance evaluation). Replicating Ueno and Wu's (1993) study, Chang *et al.* (1995) compared budget control practices in Taiwan and the USA, and found that national cultural differences had significant impact on three budget control practices (i.e., short-term vs. long-term planning, budgetary slack and short-term vs. long-term performance evaluation). Through a comprehensive worldwide study of 116,000 people from 72 countries, Hofstede (1980) identified a framework of four dimensions (power distance, individualism/collectivism, masculinity / femininity and uncertainty avoidance) that differentiate national cultures. A fifth dimension of "long-term vs. short-term orientation" was added in 1984 (Hofstede and Bond, 1984), and almost a decade later "indulgence versus restraint" became the sixth dimension (Hofstede *et al.*, 2010). Non-availability of scores for the sixth dimension leads us to focus on the first five cultural dimensions. Hofstede's cultural dimension scores for the countries targeted in this article are given in Table 4.

Table 4: Cultural Dimension Scores by Country

	Power Distance	Individualism/Collectivism	Masculinity/Femininity	Uncertainty Avoidance	Long-term Orientation
USA	40	91	62	46	29
Australia	36	90	61	51	31
New Zealand	22	79	58	49	30
Hong Kong	68	25	57	29	96
Japan	54	46	95	92	80
Malaysia	104	26	50	36	n/a
PRC	80	20	66	30	118
Singapore	74	20	48	8	48
Taiwan	58	17	45	69	87
Thailand	64	20	34	64	56

(Source: Hofstede, 1980)

Although Hofstede's study was comprehensive and is universally accepted, it is not without critics including Baskerville (2003), who argued that Hofstede's dimensions are not based on cultural traits of nations but are mostly socio-economic in nature. Baskerville contended that the difficulties of conceptualizing national culture could hamper its quantification based on numeric dimensions and matrices. Niffenegger *et al.* (2006) stressed that culture is a complex phenomenon; and disputed Hofstede's cultural framework stating that it is too general and inappropriate to explain Thai culture.

Cross-Cultural Comparison

Anderson (1995) noted that system designers' lack of consideration of social settings underlies the rejection of ABC. Similarly, Brewer (1998) pointed out that when the influence of culture is overlooked, change management practices may trigger employee defensive attitudes, which in turn, impedes the use of ABC. Rogers (2003) reported that the features of an innovation (i.e., relative advantage, compatibility, complexity, observability and trial-ability) explain 49-87% of the variance in innovation adoption. Askarany et al. (2012), however, disputed Roger's (2003) finding, arguing that only the relative benefits of ABC were positively associated with ABC adoption. While acknowledging fundamental differences in management thinking between Asia and the West; Speece (2001) argued that there are also many commonalities between the two; and that many of these differences in management thinking between Asia and the West do not necessarily stem from culture as these differences may well be attributable to factors other than culture such as different levels of economic development or historical circumstances. Speece's point is noteworthy in explaining diffusion of innovations such as ABC with reference to culture only.

In order to compare the national cultures of Australia, Hong Kong, Japan, Malaysia, New Zealand, the PRC, Singapore, Taiwan, Thailand and the USA; based on the original Hofstede scores specified in Table 4; we calculated the arithmetic mean (M), standard deviation (SD), coefficient of variation (CV) and range (R) for each cultural dimension (Table 5). To compare cultural elements, we classified the countries studied into two groups on the basis of majority cultural heritage: Australia, USA and New Zealand in one group (AUS), and Hong Kong, Japan, Malaysia, the PRC,

Singapore, Taiwan and Thailand in the other (APA). This classification is consistent with typology proposed by Gray (1988), who classified Australia, USA and New Zealand under the Anglo heading, Hong Kong and Singapore together under an Asian-Colonial heading, and Taiwan, Thailand and Malaysia as less-developed Asian countries. For the purposes of this study, countries other than USA, Australia and New Zealand were grouped together.

Table 5: Dispersion of Cultural Dimensions

	Power Distance (PDI)		Individualism/ Collectivism (IDV)		Masculinity / Femininity (MAS)		Uncertainty Avoidance (UAI)		Long-term Orientation (LTO)	
	AUS*	APA#	AUS	APA	AUS	APA	AUS	APA	AUS	APA
Mean (M)	32.7	71.5	86.7	24.3	60.3	54.4	48.7	44.8	30	80.7
Standard deviation (SD)	9.5	16.8	6.7	9.8	2.1	19.7	2.5	29.0	1.0	27.3
Coefficient of variation (CV)	29.1%	23.5%	7.7%	40.3%	3.5%	36.2%	5.1%	64.5%	3.3%	33.8%
Range (R)	18	50	12	29	4	61	5	84	2	70

*AUS=Australia, USA and New Zealand

#APA= Hong Kong, Indonesia, Japan, Malaysia, PRC, Singapore, Taiwan, Thailand

Power Distance Index (PDI)

PDI concerns an individual's attitude towards equality. Cultures that score high on power distance stress that inequality is intrinsic and should be accepted as such by members of the society. Peoples of those cultures are not inclined to question authority. In contrast, countries which are low on power distance place emphasis on equality, open and often informal communication, and seeking opinion from subordinates. These cultures are more egalitarian.

The PDI scores of Australia, USA and New Zealand vary substantially but the dispersion among Asia Pacific countries is much higher (Table 5). Judging from the means for AUS and APA, significant difference between the two groups is evident. In addition to differences between the two groups of countries, dispersion within each group suggests that there is hardly any

commonality among the countries within each group. Brewer (1998) argued that Malaysia's higher power distance score and more collectivist culture of Malaysia (26) as opposed to more individualistic culture of the USA explains the more successful implementation of ABC in Malaysia than in the USA.

Individualism / Collectivism Index (IDV)

IDV refers to the manner in which individuals describe themselves and their relationship with others. In individualistic cultures, "I" is more important than "we", in other words, self-interest overrides collective interest. Individuals who belong to individualistic cultures tend to be assertive and define themselves with their own accomplishments. In collectivist cultures however, cohesion and group welfare prevail over self. The IDV dimension lies at the heart of cultural variation (Heine, 2007), and according to Niles (1998) the IDV is the single major cultural dimension in social behaviours with respect to embracing innovations. Individualism/collectivism scores of the USA and Australia are very close (Table 4), and New Zealand's is not far below; variability in the IDV scores of AUS countries is low. Dispersion (SD=9.8) among APA countries is higher and the overall mean (M=24.3) of this group of countries is significantly lower than the mean for the AUS countries (M=86.7) with a SD of 6.7. It is noteworthy that Japan's IDV score is much higher than the rest of Asian countries involved in this study, but still only half of that of USA and Australia. A higher IDV score is generally accepted as an indication of strong individualism, which fosters personal initiative, decision-making, and promotes embracing innovations such as ABC. A lower IDV score as witnessed in most Asian countries can be seen as an obstacle to the acceptance of ABC in the early stages of implementation, which may slow down the adoption as adoption of innovation decision is typically facilitated by consensus. However, once the adoption decision is taken, the features of collectivist culture (e.g., group-work, harmony, collective goals), have the potential to help manage the implementation phase more smoothly.

Masculinity/Femininity Index (MAS)

This dimension relates to the role of gender in a culture. Assertiveness, competition and material success are paramount in cultures characterized by masculinity while cultures that score highly on femininity emphasize

interpersonal relationships, quality of life and care for others, especially the weak. The mean MAS scores of the two groups are closer than previous mean scores (see Table 5). AUS countries are very similar to each other; whereas variability is much greater among APA countries. Again, Japan is an outlier with the highest MAS score of all countries, and Thailand on the low end.

Uncertainty Avoidance Index (UAI)

UAI relates to the manner in which individuals deal with uncertainty and ambiguity. Individuals who belong to cultures high on UAI tend to be intolerant, aggressive and compulsive, and place stress on taking steps to minimize ambiguity by way of introducing rules and formalized and standardized procedures. On the other hand, cultures with low on UAI are usually relaxed show no discomfort with uncertainty, happy to accept risks that might stem from uncertainty, tolerant and relaxed. AUS countries have similar UAI scores, but APA countries' scores are highly dispersed. To a certain extent, dissimilarity among APA countries is attributable to outliers (see Table 5).

Long-Term Orientation Index (LTO)

LTO reflects the teachings of Confucius and deals with short-termism versus long-termism. Cultures that score high on LTO adopt long-term approaches in assessing achievement; quick fixes and short-term profits are often shunned. Conversely, cultures that are low on long-term orientation are characterized by their short-term stance to phenomena. For example, Chow et al. (1996, p. 187) found that Japanese managers who come from a collectivist culture "would not be as short-term oriented or as prone to manipulate performance measures as the U.S. managers. Australia and New Zealand are the only two countries in the Asia-Pacific with a culture similar to that of the USA. Their LTO scores reflect that commonality (Table 4), that is to say more short-termism in those three countries' cultures. A comparison of the means of the groups (Table 5) shows a big difference. AUS countries show very little variation on this score whereas dispersion among APA countries is much greater. In contrast to Hofstede's findings, it is noteworthy to indicate that Chan (1998) found, albeit in a smaller sample (240 US and 160 Australian subjects), that Australians' LTO score was significantly higher than that of US subjects.

Final Comments on Cultural Comparisons

The substantial cultural differences between the USA, the country of origin of ABC, and many countries in the Asia-Pacific region displayed in Table 5 suggest that national cultures need to be considered during implementation of managerial accounting practices innovated elsewhere.

Morakul and Wu (2001) examined the effects of cultural differences on resistance to ABC adoption in the three largest state-owned enterprises in Thailand, and found that successful implementation necessitates modifications in ABC in line with the cultural characteristics of the country. Similarly, Otley (1980) cautioned against the blanket application of accounting practices to all organizations and in all environments, implying that those practices should be modified to suit different circumstances. Also, Anderson and Young (1999) emphasized the importance of considering an organization's environment, including its culture, in the adoption and implementation of management accounting innovations, and Brewer (1998) suggested tailoring of ABC projects to suit cultural contexts so as to ensure a fit between people and the principles of ABC.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

In this paper we examined the state of research into ABC and TDABC in the Asia-Pacific region, and investigated the association between ABC implementation and national cultures. ABC implementation rates reported in the literature are misleading and confusing and lack consistency. The evidence presented in this study confirms the continued decline of ABC research in the Asia-Pacific region. We were surprised not to come across even a single piece of research on TDABC implementation in this region. Empirical evidence suggests that national culture plays a role in implementation decisions relating to advanced management accounting practices, including ABC. Integrating the cultural aspects of ABC implementation in future research would help uncover some pitfalls which might be responsible for the sluggish progress in ABC adoption. Hofstede's cultural scores point to cultural similarities among Australia, the USA and New Zealand, and dissimilarities among the East Asian

countries studied. Brewer's (1998) framework for exploring the relationship between national culture and ABC success would be a useful tool for such research. Given that most of the prior research was survey-based, it would be instructive to carry out case study research to investigate the association between culture and ABC implementation, as it would enable researchers to uncover organizational dynamics including power structures, interpersonal relationships and decision-making mechanisms. Future studies should also examine the reasons for adopting ABC and the factors that affect its successful implementation. Following the observations of Otley (2003), research into culture should ideally involve a non-native researcher, as it might be difficult for a native to study his or her own culture. Papers published to date, by and large, are not concerned with the interplay of ABC and the domestic culture. Similar to Bhimani's (1996) work regarding management accounting practices in Europe, future research should explore historical development of ABC research and practice within the context of established managerial thought in every country examined. Reasons underlying the variability of ABC implementation rates among nations also need further investigation. This stream of research would highlight whether obstacles and enablers are similar in cross-country experiences. Future research that includes China and Japan should overcome the language barrier by involving researchers from these two countries or who speak those languages.

LIMITATIONS

Firstly, our search was limited to the journals specified in Table 1 and the results of a ProQuest database search; we might have missed articles on ABC in the Asia-Pacific region published in other journals. Second, our study was limited to studies published in English-language journals – a serious limitation, particularly in accessing research published in Japanese and Chinese journals. The third limitation stems from the use of search words. Although every effort was made to identify relevant work, some articles may have been missed. A fourth limitation concerns authors' subjectivity in selecting articles for inclusion in the study; elected articles were reviewed by both the lead author and the co-author, but other authors might have chosen differently. The final limitation relates to Hofstede's study, which forms the basis of the cultural comparisons contained in this article. Given

that Hofstede's measures date back to 1980, such comparative arguments ignore changes in cultural dimensions which might have occurred since then.

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APPENDIX 1: ABC/TDABC-related articles included (in alphabetical order)

	Author(s)	Journal
PRC	Abdallah & Li (2008)	Management Accounting Quarterly
Malaysia	Abdul Majid & Sulaiman (2008)	Asian Review of Accounting
New Zealand	Adler et al. (2000)	Accounting Forum
New Zealand	Askarany et al. (2010)	International Journal of Production Economics
Australia & NZ	Askarany et al. (2012)	International Journal of Managerial & Financial Accounting
Malaysia	Azhar & Abdul Rahman (2009)	Malaysian Accounting Review
Australia	Baird (2007)	Accounting & Finance
Australia	Baird et al. (2004)	Management Accounting Research
Australia	Baird et al. (2007)	Accounting & Finance
Malaysia	Brewer (1998)	Management Accounting Research
Australia	Briers & Chua (2001)	Accounting, Organizations and Society
Australia	Brown et al. (2004)	Accounting & Finance
Australia	Byrne et al. (2011)	Journal of Accounting& Organizational Change
Australia	Byrne et al. (2009)	Journal of Applied Management Accounting Research
Hong Kong	Chan & Lee (2003)	Managerial Auditing Journal
Hong Kong	Chen et al. (1997)	The International Journal of Accounting
Hong Kong	Chen et al. (2001)	Asian Review of Accounting
Australia	Chenhall & Langfield-Smith (1998)	Management Accounting Research
Australia	Chenhall (2004)	Behavioural Research in Accounting
Australia	Chong and Cable (2002)	Asian Review of Accounting
Thailand	Chongruksut & Brooks (2005)	Asian Review of Accounting

	Author(s)	Journal
Singapore	Chung et al. (1997)	Accounting Research Journal
New Zealand	Cotton et al. (2003)	Management Accounting Research
Australia	Drennan & Kelly (2002)	Critical Perspectives on Accounting
PRC	Firth (1996)	Accounting, Organizations and Society
PRC	Foong & Ho (2009)	Asia-Pacific Management Accounting Journal
Singapore	Ghosh and Chan (1997)	Managerial Auditing Journal
New Zealand	Gourdie (2001)	Financial Management
New Zealand	Guilding et al. (2000)	Management Accounting Research
New Zealand	Hoque (2000)	British Accounting Review
Australia	Hutchinson et al. (1997)	Accounting Research Journal
Malaysia	Iskandar and Pourjalali (2000)	Asian Review of Accounting
PRC	Ji et al. (2007)	Asian Review of Accounting
New Zealand	Lamminmaki & Drury (2001)	The International Journal of Accounting
Australia	Lamond (1992)	Journal of Cost Management
PRC	Lawson & Yang (2012)	Journal of Cost Management
PRC	Liu and Pan (2011)	The British Accounting Review
Japan	Nishimura (1995)	The International Journal of Accounting
Singapore	Ong (1995)	International Journal of Production Economics
Malaysia	Pike et al. (2011)	The British Accounting Review
Australia	Preda & Watts (2004)	Journal of Applied Management Accounting Research
PRC	Xiong et al. (2008)	Journal of Cost Management
Australia	Reeve & Warwick (2006)	Journal of Applied Management Accounting Research
Japan	Scarbrough et al. (1991)	Management Accounting Research
New Zealand	Shanahan and Dance (1997)	Accounting Research Journal
Australia	Shanahan (1995)	Journal of Cost Management
Malaysia	Smith et al. (2008)	Asian Review of Accounting
PRC	Liu and Pan (2007)	British Accounting Review
Singapore	Spedding & Sun (1999)	International Journal of Production Economics

	Author(s)	Journal
Malaysia	Sulaiman et al. (2004)	Managerial Auditing Journal
Malaysia	Sulaiman et al. (2008a)	Asia Pacific Management Accounting Journal
Malaysia	Sulaiman et al. (2008b)	Malaysian Accounting Review
Taiwan, ROC	Tsai (1996)	International Journal of Production Economics
Taiwan, ROC	Tsai (1998)	International Journal of Production Economics
Taiwan, ROC	Tsai et al. (2008)	International Journal of Production Economics
Australia	Tse & Gong (2009)	Journal of Applied Management Accounting Research
Malaysia	Tuanmat & Smith (2011)	Asian Review of Accounting
Malaysia	Tuanmat et al. (2010)	Journal of Applied Management Accounting Research
Malaysia	Velmurugan (2010)	Journal of Performance Management
PRC	Wang et al. (2005)	Journal of Cost Management
Australia	Warwick et al. (1997)	Accounting Research Journal
Australia & Japan	Wijewardena & De Zoysa (1999)	The International Journal of Accounting
PRC	Wu et al. (2007)	The International Journal of Accounting
PRC	Xiong et al. (2008)	Journal of Cost Management
Australia	Xydias-Lobo et al. (2004)	Journal of Applied Management Accounting Research