



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
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ELECTRONIC COMMERCE IN MALAYSIA: AN
ANALYSIS OF ELECTRONIC PAYMENT SYSTEM
AND ENCRYPTION TECHNOLOGY

BY

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A dissertation submitted in partial fulfilment of the
requirement for the Master of Comparative Laws

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MARCH 2006

ABSTRACT

Electronic commerce involves the exchange of goods and services for some form of money in the virtual world without the involvement of any physical presence. Although the growth of electronic commerce in Malaysia is still considered at the infancy stage, its potential should not be discounted particularly with the widespread utilisation of the Internet in the nineties. In tandem with this scenario, the Malaysian Government has made a gigantic move by launching the Multimedia Super Corridor (MSC) whereby one of its seven flagship applications includes the active promotion of the electronic business activities in the country. Nevertheless after almost 10 years from its inception, the acceptance level of the electronic commerce by the Malaysian consumers is still regarded very low compared to the other parts of the world especially the developed countries like the United States and the European Union. Apparently, the main culprit to the growth of electronic commerce in this country relates to the security of the electronic payment system. In relation thereof, the main objective of this study is to critically analyse the various types of electronic payment systems, the security issues and other related problems associated with the electronic payment systems. Further, some discussion would be devoted on the encryption technology as the technical solution to the security concern of the electronic payment system.

ملخص البحث

تقوم التجارة الإلكترونية على تبادل البضائع والخدمات في شكل من أشكال النقد في عالم واقعي بدون أي مظهر فيزيقي. بالرغم من أنّ نمو التجارة الإلكترونية في ماليزيا مازال في الأطوار الأولية، إلا أنه لا يمكن تجاهل احتمال تطوره، خاصة في ظل الانتشار الواسع لاستخدام الإنترنت منذ التسعينات. وفي ظل هذا السيناريو الترادفي، فقد أحدثت الحكومة الماليزية حركة عملاقة بإطلاقها معابر أو نوافذ الأنظمة المتعددة (MSC) التي من بين أهم تطبيقاتها السبعة الترقية الفاعلة لأنشطة التجارة الإلكترونية في الدولة. وبالرغم من مرور عشر سنوات منذ بدايتها، إلا أن مستوى قبول التجارة الإلكترونية لدى المستهلك الماليزي مازال ضعيفاً مقارنة بما يجري في أنحاء العالم المختلفة، خاصة في الدول المتقدمة كالولايات المتحدة والاتحاد الأوروبي. ويبدو ظاهرياً أن النقرة السلبية الرئيسة في نمو التجارة الإلكترونية تتعلق بتأمين نظام الدفع الإلكتروني. واستناداً إلى ما سبق ذكره، فإن الهدف الرئيس للدراسة الحالية هو التحليل الدقيق لنماذج أنظمة الدفع الإلكتروني وقضايا التأمين والمشكلات الأخرى المتعلقة بأنظمة الدفع الإلكتروني، بالإضافة إلى ذلك سوف تركز بعض المناقشات في صياغة رموز إلكترونية كحل تقني لقضية تأمين نظام الدفع الإلكتروني.

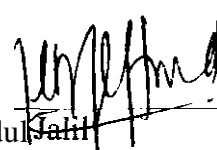
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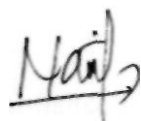
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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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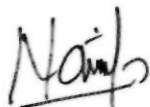
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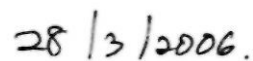
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Specially dedicated to my beloved wife Amalina Abdullah and my lovely children
Muhammad Aqil Darwish and Nur Husnina Darwishah.

ACKNOWLEDGEMENTS

In the name of Allah, the Most Gracious and the Most Merciful. First and foremost, I would like to express my heartiest gratitude and appreciation to my respected supervisor Assoc. Prof. Dr. Ida Madieha Abd Ghani Azmi who had assisted me in the preparation and accomplishment of this dissertation. Undoubtedly, without her extensive assistance in contributing ideas, comments and for reviewing a few drafts, this dissertation would have not been completed. I would also like to thank ASSOC Prof. Dr. Ibrahim Ali, the Dean of College of Business Management and Accounting, Universiti Tenaga Nasional (UNITEN) and my former Head of Department, Department of Marketing & Science Management, Dr. Rusinah Siron for their moral support during my study leave for the period of 18 months. I am also very much grateful to my parents, Haji Ismail @ Nawang and Hajjah Hasnah, my parents-in-laws Haji Abdullah and Hajjah Kamariah and all of my brothers and sisters as well as my in-laws for their support to me. Finally I would like to thank all the persons who are directly or indirectly involved in completing this dissertation. May all their sincere help be rewarded by Allah.

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CHAPTER ONE

1.1. INTRODUCTION

Malaysia's move into the Information Age¹ of the 21st century began as early as 1996 with the formulation of the National IT Agenda (NITA)² and the subsequent development of the Multimedia Super Corridor (MSC), the Malaysia's version of Silicon Valley.³ The MSC was launched by the former Malaysian Prime Minister Tun Dr Mahathir Mohamad on 1st August 1996 at the inaugural Multimedia Asia Conference and Exhibition' 96.⁴ This gigantic project seeks to provide a regional hub attracting investment and support from the world's most renowned Information and Communication Technology (ICT) and multimedia companies comparable to the Silicon Valley in the United States and Silicon Plateau in Bangalore, India⁵.

¹ The impetus of the Information Age is the widespread utilisation of the Global Infrastructure Network or the Internet. See Ding, Julian, *E-Commerce: Law and Practice*, Sweet & Maxwell Asia, 1999 at 4.

² National ICT Security and Emergency Response Centre (NISER), "NISER: About Us," <<http://www.niser.org.my/about.html>> viewed on 13 May 2005.

³ The term Silicon Valley was coined by journalist Don C. Hoefler in 1971. It is a nickname for the southern part of the San Francisco Bay Area in northern California, USA where high concentration of semiconductor chips made of silicon and computer related industries are the principal product of the area. It is contained by the San Francisco Bay on the east, the Santa Cruz Mountains on the west and the Coast Range to the southeast. See <<http://www.siliconvalley-usa.com>> and <http://en.wikipedia.org/wiki/Silicon_Valley> viewed on 13 May 2005.

⁴ For brief history of the conceptualisation of MSC see <<http://www.mdc.com.my/msc/milestones.asp>> viewed on 13 May 2005.

⁵ Rao, Madanmohan, "Silicon Plateau of India: Hope And Hype In Bangalore," *Bandwidth Magazine*, <http://www.commsday.com.au/magazine/asian_century/nov_dec2003/nov_dec2003_02.htm> viewed on 13 May 2005.

Despite the fact that MSC aims to become a world-class technology hub,⁶ the domestic electronic commerce industry will indirectly benefit from this bold venture. Moreover, the concerted efforts by the Malaysian government and the ICT industry including promoting electronic commerce, enhancing human resource development in ICT and expediting the implementation of the MSC flagship application⁷ has accelerated the growth of electronic commerce activities in Malaysia.⁸ This can be seen from the empirical data collected by International Data Corporation (IDC).⁹ According to IDC, Malaysia's ICT market is expected to reach RM40 billion in 2007 and total ICT spending in 2004 is estimated to be RM9.5 billion, expanding at an annual growth rate of 8.3 percent.¹⁰ Regarding the prospect of electronic commerce, IDC forecasts that business-to-business (B2B) electronic commerce market in Malaysia is projected to be RM29.6 billion while the business-to-consumer (B2C) electronic commerce market is expected to reach RM5.7 billion in 2005.¹¹

⁶ The words used by the Malaysian Prime Minister, Abdullah Ahmad Badawi in his opening remarks at the launch of the 8th MSC International Advisory Panel (IAP) Meeting on 2nd September 2004 at Putrajaya Convention Centre. See Malaysia External Trade Development Corporation (MATRADE), "Moving the MSC Towards Becoming a World-Class Technology Hub," <<http://www.matrade.gov.my/e-commerce/news-archive/2004/ecom-132004.htm>> viewed on 13 May 2005.

⁷ The MSC Flagship Applications consist of the Electronic Government, Multipurpose Card, Smart Schools, Telehealth, R&D Cluster, E-Business and Technopreneur Development. For further details see Multimedia Development Corporation (MDC) website at <<http://www.msc.com.my/msc/flagships.asp>> viewed on 13 May 2005.

⁸ MATRADE, "MITI: M'sia ICT Spending to Increase in Tandem with Global Trend," <<http://www.matrade.gov.my/e-commerce/news-archive/2004/ecom-122004.htm>> viewed on 13 May 2005.

⁹ IDC is the premier global market intelligence and advisory firm in the information technology and telecommunication industries. See <<http://www.idc.com>> viewed on 13 May 2005.

¹⁰ MATRADE, n. 7.

¹¹ MATRADE, <http://www.matrade.gov.my/e-commerce/fact_figure.htm> viewed on 13 May 2005.

Thus, based on the aforesaid figures it can be assumed that the potential of electronic commerce industry in Malaysia is very huge and should be regarded as an alternative to the brick and mortar business in this new millennium. Alas, even though electronic commerce can generate a long list of advantages and benefits, there are still problems and drawbacks that need to be considered before embarking on the online transaction. Apparently, the threats to electronic commerce come mostly from the area of security. For this reason, it is reported that one of the main obstacles to the growth of electronic commerce in Malaysia is security fear.¹²

1.2. SECURITY OF ELECTRONIC COMMERCE

Electronic commerce is the creation of commercial transactions between the parties which are done electronically.¹³ It involves the exchange of goods or services for some form of money in the electronic environment without the involvement of any face-to-face communication. The parties to the transaction are not at the same physical location and the transaction is conducted through electronic medium.

¹² The Economist, "Taylor Nelson Sofres: E-Commerce Stumbles in Malaysia," *ebusinessforum.com*, 13 July, 2001, <http://www.ebusinessforum.com/index.asp?layout=printer_friendly&doc_id=3984> viewed on 13 May 2005.

¹³ Ding, n. 1 at 21.

Obviously, the security of electronic commerce appears to be the main concern for consumers and businesses not only in Malaysia but also in other parts of the world. In the cyber world, the electronic system that supports electronic commerce is susceptible to abuse and failure in many ways such as fraud, theft of confidential information, disruption of service, violation of data integrity, breach of privacy, loss of customer confidence and many more. The list is not exhaustive of the various types of computer abuses and most likely to increase day by day in line with the rapid advances in technology.

While the reality of the Internet boom in the nineties has triggered the global explosion of the electronic commerce industry, numerous sources have touted security as the leading barrier to the widespread commerce on the Internet.¹⁴ To most consumers in Malaysia, the issue of security over the Internet is the most overwhelming impediment facing the adoption of electronic commerce.¹⁵ As a result, most potential electronic commerce consumers are reluctant to transmit their credit card numbers over the Internet.¹⁶

¹⁴ N. R. Adam *et al*, *Electronic Commerce: Technical, Business and Legal Issues*, Prentice Hall, 1999 at 123.

¹⁵ Norazah Mohd Suki, "Motivation and Concern Factors for Internet shopping: A Malaysian Perspective," Multimedia University, Malaysia, <<http://minbar.cs.dartmouth.edu/greecom/ejeta/second-issue.php?download=ejeta-2002.05.14.04.09.49.pdf>> viewed on 13 May 2005.

¹⁶ H. H. Perrit, Jr., "Legal and Technological Infrastructures for Electronic Payment Systems," *Rutgers Computer and Technology Law Journal*, vol. 22, no. 1 (1996): 1. LexisNexis, via Lexis, <<http://www.lexis.com>>.

Perhaps this is due to the wide publicity by the mass media which have been focusing on the cases of credit card fraud and consequently creating a distorted image to the electronic commerce. As the public at large are extremely influenced by the media, it is of no surprise when one report reveals that thirty seven percent of Internet users in Malaysia expressed worries about the potential misuse of credit card details in the electronic commerce.¹⁷

On this point, the author would like to concur with one view which asserts that such fear is unfounded.¹⁸ Indeed, the traditional use of credit cards in the offline transaction is by no means more secure and also vulnerable to fraudster strike. For instance, early last year, three card fraudsters have been arrested in Kajang, Selangor and charged under Section 472 of the Penal Code.¹⁹ The police believed that the card fraudsters were working with bank staff and merchants by installing a device on the credit card machine to extract data such as the account number of a card owner and the issuing bank. Once they have completed the jobs and the cards are ready for delivery, they would each be paid RM 10,000. The cards were later used to buy luxurious items such as expensive clothes and jewellery. Based on the initial investigation, the lost could amount to RM 35 million.²⁰

¹⁷ The Economist, n. 11.

¹⁸ Lee Swee Seng, "Legal Issues in B2C E-Commerce in Malaysia," *Malayan Law Journal*, <<http://www.mlj.com.my/free/articles/sslee3.htm>> viewed on 13 May 2005.

¹⁹ Act 574.

²⁰ P. Gill, "Cops Bust Cloning Gang," *The Star*, 7 February, 2004, 19.

Two other cases involving the use of counterfeit credit cards were reported last year. In the first case, police detained one suspect in Dengkil believed to be a member of syndicate selling petrol bought using cloned credit cards and uncovered 111 cloned cards including credit cards and company petrol charge cards in his possession.²¹ Whilst in the second case, police arrested two Malaysian suspects in Singapore and recovered about S\$15,000 worth of luxury goods and counterfeit credit cards in their possession.²² Thus, these cases prove that the hype surrounding electronic commerce is groundless as credit card fraud also arises in the brick and mortar business.

1.3. DEFINITION OF SECURITY

In relation to electronic commerce, security refers to protection of data, software or hardware against accidental or intentional damage from a defined threat.²³ The word 'security' is defined as 'measures taken to guard against espionage or sabotage, crime, attack or escape'.²⁴ Security is further defined in an additional

²¹ "Man Arrested with Cloned Credit Cards," *Bernama*, 18 December, 2004, via Bernama.com, <<http://www.bernama.com/bernama/v3/printable.php?id=109479>> viewed on 13 May 2005.

²² "Malaysian held for credit card fraud," *The Star*, 25 December, 2004, via The Star Online, <<http://thestar.com.my/services/printerfriendly.asp?file=/2004/12/25/asia/9745418.asp&sec=asia>> viewed on 25 January, 2005.

²³ E. M. Awad, *Electronic Commerce: From Vision to Fulfillment*, Prentice Hall, 2002 at 73.

²⁴ Adam et al, n. 13 at 123.

sense as 'freedom from danger,' and 'freedom from fear or anxiety'.²⁵ As for the word espionage, it refers to the act of spying by unauthorised persons to gain access to the government and private computer systems to view confidential information.²⁶ Meanwhile sabotage refers to the wilful destruction of property. On the Internet, saboteurs try to gain entry into computer systems to destroy information and their work can be devastating.²⁷

A number of high-profile security breaches have been reported in the United States including web sites representing the CIA, the U.S Air Force, the Department of Justice and NASA. For instance, in August 1996 the Department of Justice's (DOJ's) web site (i.e. www.usdoj.gov) was vandalized by crackers (i.e. people who try to gain unauthorised access to computer systems to alter, damage or steal information by guessing user IDs and passwords) who broke into the DOJ's web host machine.²⁸ Even, hackers have penetrated the closely guarded web site like Pentagon.²⁹ Due to this reason, some computer experts concluded that security is an illusion.³⁰

²⁵ Ibid

²⁶ F. Fuller, *Getting Started with Electronic Commerce*, Dryden, 2000 at 19.

²⁷ Ibid.

²⁸ A. K. Ghosh, *E-commerce Security: Weak Links, Best Defences*, Wiley Computer Publishing, 1998 at 11.

²⁹ Syed Mahbubur Rahman and M. S. Raisinghani (eds), *Electronic Commerce: Opportunity and Challenges*, Idea Group Publishing, 2000 at 377.

³⁰ R. Gainer, "A Cyberspace Perspective: Allocating the Risk of Loss for Bank Card Fraud on the Internet," *The John Marshall Journal of Computer & Information Law*, vol. 15, no. 39 (1996): 2. LexisNexis, via Lexis, <<http://www.lexis.com>>.

1.4. SCOPE OF ELECTRONIC COMMERCE SECURITY

Of to date, a variety of technological solutions have been developed to assure consumers and businesses of security in electronic transactions. In any online activity, a number of software (i.e. program which instructs the computer how to process data) components will be used to handle online transaction. Out of the various types of software components, the security of electronic commerce transaction is very much dependable on four fronts namely web client security, data transport security, web server security and operating system security.³¹ These are the most critical components that make up almost any electronic commerce transaction. A flaw in any of the components can compromise the security of the entire transaction.

Securing data during transport is important to protect sensitive data such as credit card numbers from being observed in transit by unauthorized third parties. As the transaction data can be read, modified or made up by anyone with sufficient experience and tenacity, many resources in securing electronic commerce have been heavily focused on data transaction security.³² Currently, several protocols are being employed to secure the data transaction in electronic commerce applications and almost all of these protocols relate to the electronic payment system.

³¹ Ghosh, n. 26 at 21.

³² Ibid., 23.

Nevertheless, it is important to emphasize that securing only one part of the software components i.e. data transport security would not be sufficient in securing the whole electronic commerce transaction. However, due to time constraints and word limitations, it is not the intention of this study to cover all facets of the security processes. In addition, further discussion on the software components would be highly technical in nature so as to be out of the scope of this legal study. Thus, this study would primarily focus on the most critical security concern for consumers engaging in electronic commerce i.e. the security of electronic payment system which is considered as the cornerstone of any financial transaction.

In relation thereof, the current study attempts to critically analyse the various types of electronic payment systems, the security issues and other related problems associated with the existing and new electronic payment system, the regulatory framework of the electronic payment system under the new Payment Systems Act 2003³³ and the legal protection accorded to the online customer for any security breaches of the electronic payment system under the Malaysian law as well as under various other jurisdictions. Beside the payment system, some discussion would be made on encryption technology as the technical solution to the security concern and a brief analysis of the future of electronic payment system in Malaysia.

³³ Act 627.

CHAPTER TWO

2.1. OVERVIEW OF ELECTRONIC PAYMENT SYSTEM

The exponential growth of electronic commerce in the recent years has raised the significance of developing suitable payment systems to accommodate online transaction. Since electronic commerce transactions involve communication and transmission of digital streams over telecommunication system, the whole payment mechanism for electronic commerce must be converted into digital ones and zeros. Thus, the traditional paper based payment instruments such as paper currency and cheque are no longer suitable. Accordingly, this scenario necessitates the use of electronic payment system either through the Internet or other electronic means in order to complement the nature of electronic commerce transactions.

Notwithstanding the fact that the use of cheques will continue to remain pervasive in Malaysia, particularly for non-cash retail payments, currently more consumers are realising the convenience and flexibility of electronic payment system.¹

This is reflected in the declining number of cheques cleared via the SPICK ('Sistem Penjelasan Imej Cek Kebangsaan') cheque clearing centres operated by the Central

Bank of Malaysia (BNM) which are located in three regions nationwide i.e. the

¹ Zeti Akhtar Aziz, "Governor's Speech at the Official Launch of the Financial Process Exchange (FPX)," Bank Negara Malaysia (BNM), <<http://www.bnm.gov.my/index.php?ch=9&pg=15&ac=159>> viewed on 14 May 2005.

Northern region, Central region and Southern region. In the first quarter of 2003, the number of cheques processed declined slightly by 3.19 percent to 42.62 million, compared to the previous quarter. Accordingly, the value of cheques cleared through these centres has also declined, albeit at a lower rate of 1.31 percent to RM265.25 billion.²

On the contrary, the volume and value of Interbank GIRO (IBG) transactions operated by the Malaysian Electronic Payments (1997) Sdn. Bhd. (MEPS) had increased during the first quarter of 2003 by 17.84 percent to RM 0.21 million transactions and 8.81 percent to RM1.41 billion from the fourth quarter of 2002.³

Although it is difficult to estimate precisely the potential of electronic payment system, the lower rate of cheques cleared through SPICK cheque clearing centres and the increase in IBG transactions could be regarded as a good sign that the use of electronic payment system is gaining greater acceptance from the Malaysian consumers.

Similarly, in most developed countries the use of cheque has also declined to negligible levels compared to the electronic payment system. For instance in the United States, the data from the Bank for International Settlements (BIS)⁴ and the

² Bank Negara Malaysia (BNM), "Payment Systems," First Quarter of the Quarterly Bulletin 2003, <<http://www.bnm.gov.my/files/publication/qb/2003/Payment.Systems.pdf>> viewed on 14 May 2005.

³ Ibid.

⁴ Bank for International Settlements (BIS) is an international institution operated by major central banks. See <<http://www.bis.org>> viewed on 14 May 2005.

National Automated Clearing House Association (NACHA)⁵ shows that even though cheque usage remains at an extremely high level, its share is trending downward as the growth in cheque use trails the growth of other electronic payment types.⁶ Credit cards, debit cards, automated clearing house (ACH) transactions and wire transfers are all experiencing faster growth than cheque, whereby the sum of the transaction shares rose from 21 percent in 1993 to 28 percent in 1997.⁷

For this reason, the Clinton Administration in 1997 issued a Framework for Global Electronic Commerce (the Framework) that established five basic principles to facilitate the development of commerce on the Internet.⁸ Significantly, the Framework had also identified electronic payment system as a key element of global electronic commerce.⁹ Corresponding to this idea, BNM and the local financial institutions have introduced a vast array of electronic payment systems to facilitate the online transfer of value between the contracting parties without the need for any physical face-to-face involvement.

⁵ NACHA is a not-for-profit trade association that develops operating rules and business practices for the ACH Network and for other forms of electronic payments. See <<http://www.nacha.org>> viewed on 14 May 2005.

⁶ M. Sawhney, R. Gulati and A. Paoni, *Techventure: New Rules on Value and Profit from Silicon Valley*, Wiley, 2001 at 196.

⁷ Ibid.

⁸ J. Reagle Jr., "W3C Activities Related to the US Framework For Global Electronic Commerce," <<http://www.w3.org/TR/NOTE-framework-970706.html>> viewed on 14 May 2005.

⁹ K. L. Macintosh, "The New Money," *Berkeley Technology Law Journal*, vol. 14, no. 659 (1999): 2. LexisNexis, via Lexis, <<http://www.lexis.com>>.

2.2. WHAT IS ELECTRONIC PAYMENT SYSTEM?

The idea of electronic payment system is not new. Indeed the first international wire transfer¹⁰ of funds occurred soon after the transatlantic telegraph cable was laid in the 1880s, linking the United States with the United Kingdom.¹¹ Although some people link electronic payments to electronic commerce transactions, electronic payments encompass a much wider scope than the Internet-centred definition. In fact, the best-known forms of electronic payments such as inter-bank transfer via SWIFT or credit card clearing have been in operation long before the advent of the Internet.¹²

In the past, since electronic payment systems had been too costly to use for low-value transactions, electronic payment systems had simply been dominated by large businesses and financial service organisations to displace high-value transactions.¹³ However, advances in telecommunications and computer technologies now make electronic payment systems viable for small businesses and individuals.¹⁴ At this point, it is important to emphasise that electronic payment systems are not themselves money but represent a private substitute for money that is

¹⁰ Wire transfer transactions are high-value wholesale payments made among banks and other financial institutions.

¹¹ J. Bagby, *E-Commerce Law: Issues for Business*, Thomson South-Western West, 2003 at 399.

¹² Global Electronic Finance (GEF), "Institutional Payment Systems and the Internet," Financial Internet Working Group, <<http://www.fininter.net/payments/payissuespaperpt.htm>> viewed on 14 May 2005.

¹³ R.W. Sifers, "Regulating Electronic Money in Small-Value Payment Systems: Telecommunications Law as a Regulatory Model," <<http://www.law.indiana.edu/fclj/pubs/v49/no3/sifers.html>> viewed on 14 2005.

¹⁴ Ibid.