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**ROLE OF INFORMATION TECHNOLOGY IN ENHANCING THE  
EFFECTIVE FUNCTIONING OF INDIAN FINANCIAL SYSTEM: AN  
EMPIRICAL STUDY**

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**ABSTRACT**

Reserve bank of India undertook important steps covering IT infrastructure and implementation of new applications to ensure safety, security, soundness, efficiency, accessibility and authorisation in the payment and settlement systems. The payment and settlement systems are the highly important arenas of the economic and financial infrastructure and contribute to the overall economic performance and financial stability by facilitating efficient financial intermediation. Indian financial system has got plenty of payment systems and products reflecting continuation of traditional paper based mode of payments along with a significant growth in a range of diverse electronic modes of payments. Technology is reason behind the developments in payment and settlement systems in India. In our nation the growth of the Technology based payment and settlement systems have been significant in recent years. The Reserve Bank of India plays critical role in harnessing the benefits of advances in Information

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Technology (IT), both for the banking sector as a whole and its own operations. Presently the payment and settlement systems are functioning smoothly and efficiently. With the application of various advanced technologies the payment and settlement systems ensuring the timely settlement of both systemically important high value transactions and retail transactions of the public at large. An attempt has been made in this paper to find how the IT based payment and settlement systems are paving the way for the growth of Indian financial system in the recent years.

**Key words:** IT Infrastructure, Payment and Settlement Systems, BPSS, Financial Infrastructure & Economic Performance

## **Introduction**

Reserve bank of India undertook important steps covering IT infrastructure and implementation of new applications to ensure safety, security, soundness, efficiency, accessibility and authorisation in the payment and settlement systems. The payment and settlement systems are the highly important arenas of the economic and financial infrastructure and contribute to the overall economic performance and financial stability by facilitating efficient financial intermediation. Indian financial system has got plenty of payment systems and products reflecting continuation of traditional paper based mode of payments along with a significant growth in a range of diverse electronic modes of payments. Technology is reason behind the developments in payment and settlement systems in India. In our nation the growth of the Technology based payment and settlement systems have been significant in recent years. The Reserve Bank of India plays critical role in harnessing the benefits of advances in Information Technology (IT), both for the banking sector as a whole and its own operations. Presently the payment and settlement systems are functioning smoothly and efficiently. With the application of various advanced technologies the payment and settlement systems ensuring the timely settlement of both systemically important high value transactions and retail transactions of the public at large. RBI has made a regulatory framework to facilitate the payment and settlement

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Vol. 1 Issue 2 July 2011

---

systems by passing payment and settlement systems Act (The PSS Act), 2007. Under the PSS Act RBI has constituted an apex body, The Board for Regulation and Supervision of Payment and Settlement Systems (BPSS). The Department of payment and settlement systems (DPSS) of the Reserve Bank of India assists the BPSS in administering various provisions of the PSS Act. During the end of June 2010 BPSS has granted authorisation to 37 payment system operators of prepaid payment instruments, card schemes, cross border inward money transfers, Automated teller machines (ATM) networks and centralised clearing arrangements.

**Table 1.1 Showing the Payment System Indicators –Annual Turnover (volume in 000s)**  
**from 2005-2010**

	2005-06	2006-07	2007-08	2008-09	2009-10
<b>Systematically important payment systems (SIPS)</b>					
High value clearing	15924	18730	21919	21848	5525
RTGS	1767	3876	5840	13366	33241
<b>Total SIPS (A)</b>	<b>17691</b>	<b>22606</b>	<b>27759</b>	<b>35214</b>	<b>38766</b>
<b>Financial Markets clearing</b>					
Government Securities Clearing	151	167	216	270	346
Forex Clearing	490	606	757	838	884
<b>Total Financial Markets clearing (B)</b>	<b>641</b>	<b>773</b>	<b>973</b>	<b>1108</b>	<b>1230</b>
<b>Others</b>					
MICR clearing	1015912	1125373	1201045	1140492	1143164
Non-MICR Clearing	254922	223177	237600	233566	230567
Retail electronic clearing	83241	148997	218800	280610	971485
Cards	201772	229713	316509	387215	404379
<b>Total Others (C)</b>	<b>1555847</b>	<b>1727260</b>	<b>1973954</b>	<b>2041883</b>	<b>2749595</b>

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Vol. 1 Issue 2 July 2011

---

<b>Grand Total (A+B+C)</b>	<b>1574179</b>	<b>1750639</b>	<b>2002686</b>	<b>2078205</b>	<b>2789591</b>
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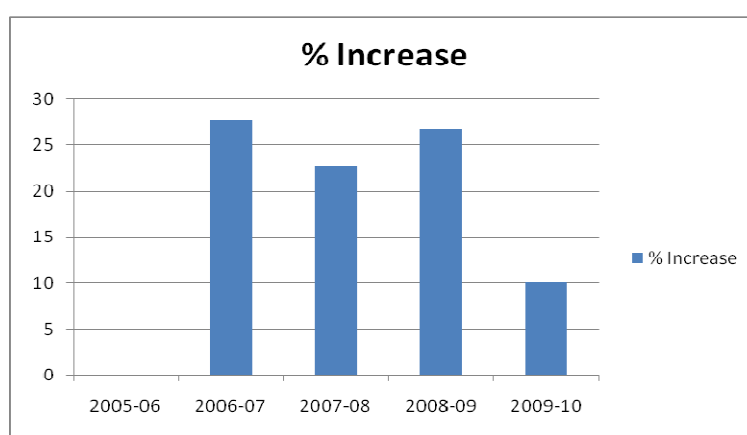
Source: Reserve Bank of India

**Table 1.2 showing the comparative analysis of volume of systematically important payment systems (SIPS) in terms of percentage**

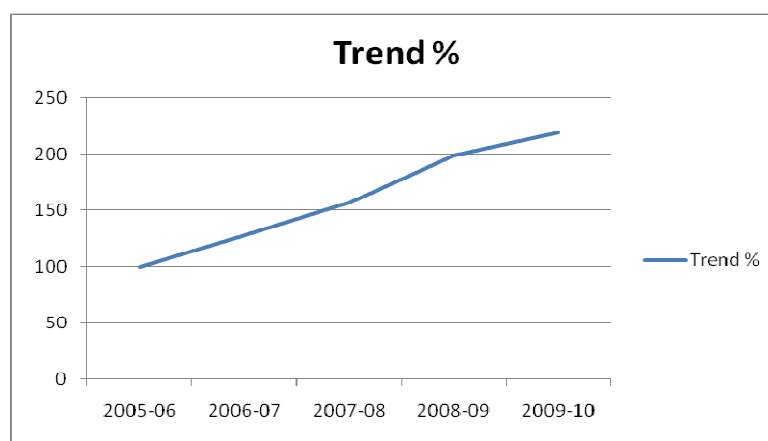
	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>
<b>Systematically important payment systems (SIPS)</b>	17691	22606	27759	35214	38766
<b>% Increase</b>	-	27.78	22.79	26.86	10.09
<b>Trend %</b>	100	127.78	156.91	199	219

Source: Computed data

**Chart 1.1 showing the % increase of volume of systematically important payment systems (SIPS)**



**Chart 1.2 showing the trend of volume of systematically important payment systems (SIPS)**



**Inferences**

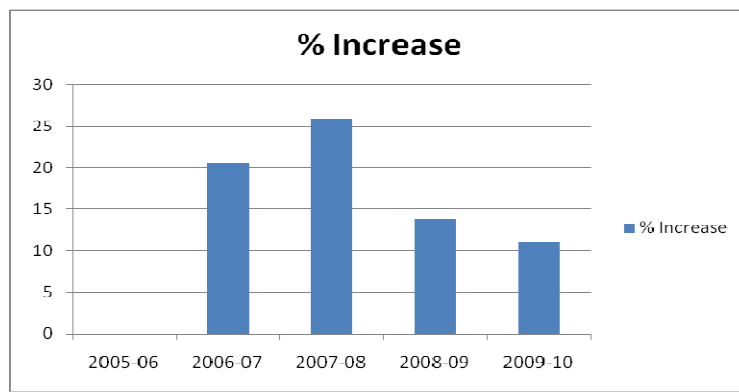
- As far as systematically important payment systems (SIPS) are concerned the volume of transaction keeps on increasing over the period of 2005 to 2010. During the years, a marginal increment of 10% is found in the year 2009-10.
- The volume of transaction has been increased to two fold times from the year 2005-06 to 2009-10

**Table 1.3 showing the comparative analysis of volume of Financial Markets clearing in terms of percentage**

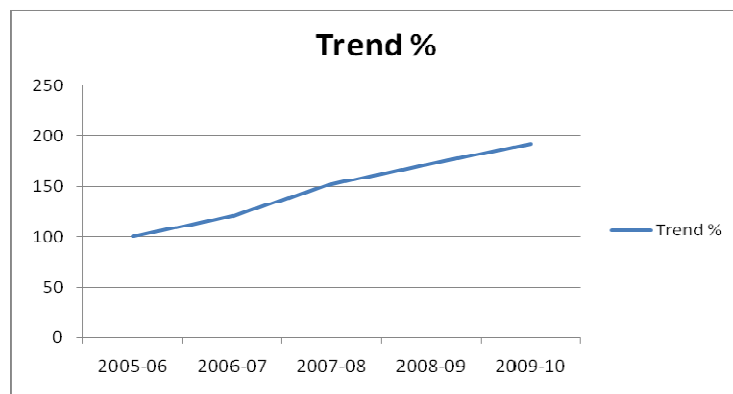
	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>
<b>Financial Markets clearing</b>	641	773	973	1108	1230
<b>% Increase</b>	-	20.59	25.87	13.87	11.01
<b>Trend %</b>	100	120.59	151.79	172.85	191.89

Source: Computed data

**Chart 1.3 showing the % increase of volume of Financial Markets clearing**



**Chart 1.4 showing the trend of volume of Financial Markets clearing**



**Inferences**

- As far as financial markets clearing is concerned the volume of transaction has been increased in the increasing trend in the years 2006 and 2007, whereas the year 2008

and 2009 witnesses a decline in the increasing trend I.e., the volume of transaction has been increased in decreasing trend in the year 2008 and 2009

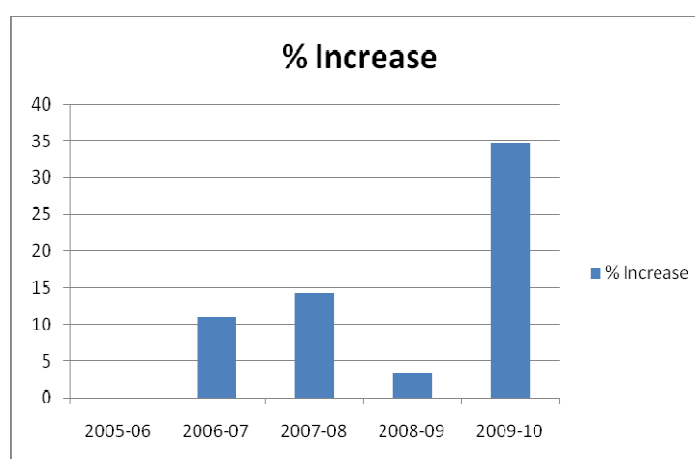
- As far as the trend percentage is concerned the volume of transaction keeps on increasing at a steady pace over the period of 2005 to 2010

**Table 1.4 showing the comparative analysis of volume of other Payment System Indicators in terms of percentage**

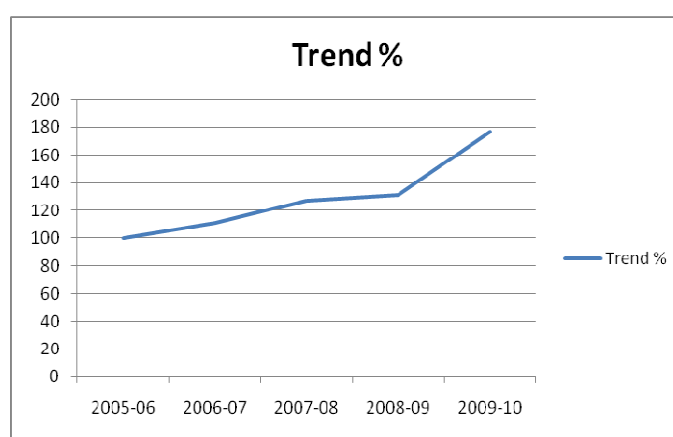
	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>
<b>Other Payment System Indicators</b>	1555847	1727260	1973954	2041883	2749595
<b>% Increase</b>	-	11	14.28	3.44	34.66
<b>Trend %</b>	100	111	126.87	131.24	176.73

Source: Computed data

**Chart 1.5 showing the % increase of volume of other Payment System Indicators**



**Chart 1.6 showing the trend of volume of other Payment System Indicators**



**Inferences**

- As far as the other payment system indicators are concerned the volume of transaction has steadily increased in the year 2006, 2007 & 2009. In the year 2008 the volume of transaction shows a declining in the growth trend
- As far as the trend percentage is concerned the volume of transaction keeps on increasing at a steady pace over the period of 2005 to 2010

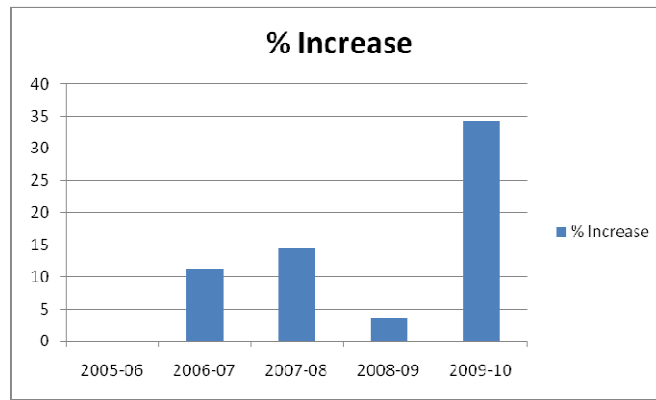
**Table 1.5 showing the comparative analysis of volume of total Payment System Indicators in terms of percentage**

	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>
<b>Payment System Indicators</b>	1574179	1750639	2002686	2078205	2789591
<b>% Increase</b>	-	11.21	14.38	3.77	34.23
<b>Trend %</b>	100	111.21	127.22	132	177.21

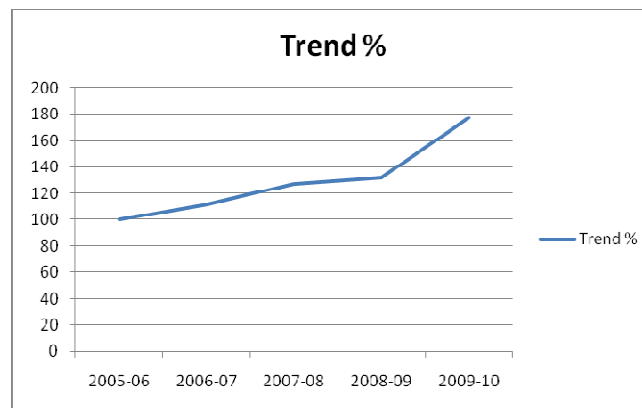
Source: Computed data



**Chart 1.7 showing the % increase of volume of total Payment System Indicators**



**Chart 1.8 showing the trend of volume of total Payment System Indicators**



**Inference**

- In case of taking total payment system indicators, it is found that except the year 2008-09 all the years have witnessed a sufficient growth in terms of volume of transaction.

# International Journal of Enterprise Computing and Business Systems

ISSN (Online) : 2230-8849

<http://www.ijecbs.com>

Vol. 1 Issue 2 July 2011

---

- As far as the trend percentage is concerned the volume of transaction keeps on increasing at a steady pace over the period of 2005 to 2010

**Table 1.6 Showing the Payment System Indicators –Annual Turnover (value in Rs 000s) from 2005-2010**

	2005-06	2006-07	2007-08	2008-09	2009-10
<b>Systematically important payment systems (SIPS)</b>					
High value clearing	4981428	5034007	5500018	4550667	1861560
RTGS	11540836	18481155	27318330	32279881	39453359
<b>Total SIPS (A)</b>	<b>16522264</b>	<b>23515162</b>	<b>32818348</b>	<b>36830548</b>	<b>41314919</b>
<b>Financial Markets clearing</b>					
Government Securities Clearing	2559260	3578037	5602602	6254519	8986718
Forex Clearing	5239674	8023078	12726832	16937489	14411486
<b>Total Financial Markets clearing (B)</b>	<b>7798934</b>	<b>11601115</b>	<b>18329434</b>	<b>23192008</b>	<b>23398204</b>
<b>Others</b>					
MICR clearing	4492943	5401429	6028672	5849642	6664003
Non-MICR Clearing	1854763	1606990	1867376	2060893	1878425
Retail electronic clearing	106598	186160	971485	416419	598740
Cards	39783	49533	70506	83903	89516
<b>Total Others (C)</b>	<b>6494087</b>	<b>7244112</b>	<b>8938039</b>	<b>8410857</b>	<b>9230684</b>
<b>Grand Total (A+B+C)</b>	<b>30815285</b>	<b>42360389</b>	<b>53357502</b>	<b>68433413</b>	<b>73943807</b>

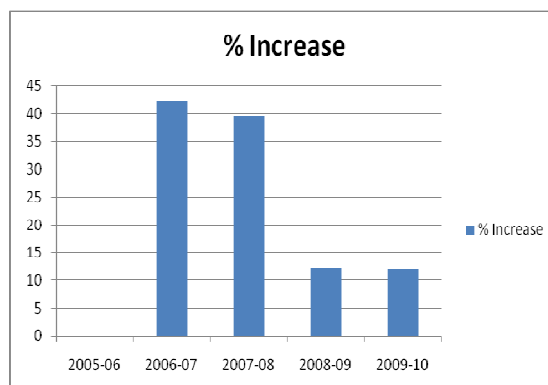
Source: Reserve Bank of India

**Table 1.7 showing the comparative analysis of value (Rs in 000) of systematically important payment systems (SIPS) in terms of percentage**

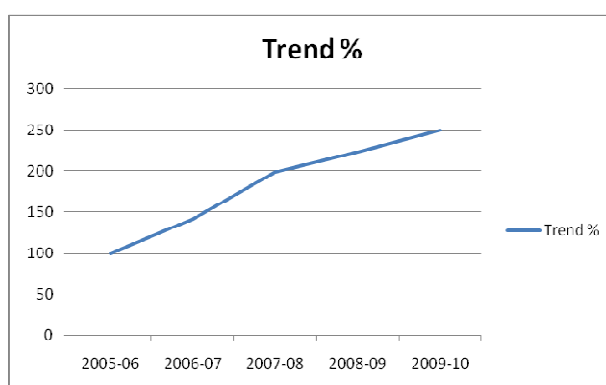
	2005-06	2006-07	2007-08	2008-09	2009-10
<b>Systematically important payment systems (SIPS)</b>	16522264	23515162	32818348	36830548	41314919
<b>% Increase</b>	-	42.32	39.56	12.23	12.18
<b>Trend %</b>	100	142	199	223	250

Source: Computed data

**Chart 1.9 showing the % increase of value of systematically important payment systems (SIPS)**



**Chart 1.8 showing the trend of value of systematically important payment systems**



**Inferences**

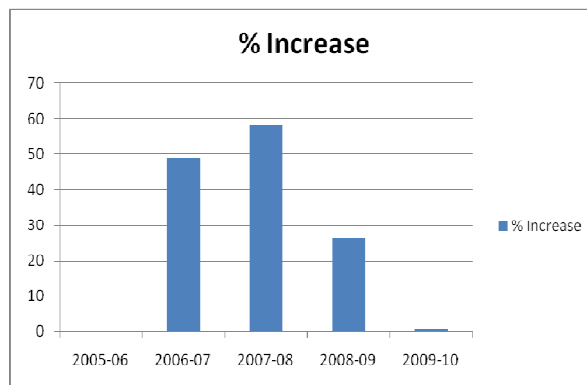
- As far as systematically important payment systems (SIPS) are concerned the value of transaction has been increased in decreasing trend from the year 2006 to 2010.
- As far as the trend percentage is concerned the value of transaction stands at 2.5 times of base year (2005-06)

**Table 1.8 showing the comparative analysis value (Rs in 000) of Financial Markets clearing in terms of percentage**

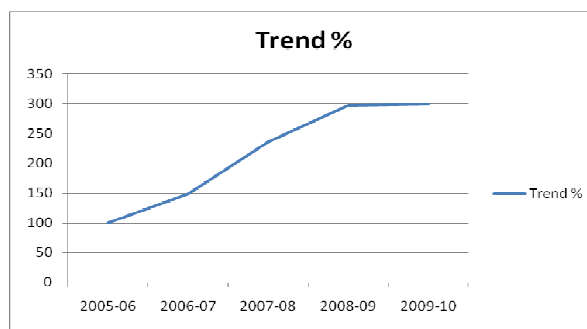
	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>
<b>Financial Markets clearing</b>	7798934	11601115	18329434	23192008	23398204
<b>% Increase</b>	-	48.75	58.00	26.53	0.89
<b>Trend %</b>	100	149	235	297	300

Source: Computed data

**Chart 1.9 showing the % increase of value of Financial Markets clearing**



**Chart 1.10 showing the trend of value of Financial Markets clearing**



**Inferences**

- As far as financial markets clearing is concerned the value of transaction has been increased in the increasing trend in the years 2006 and 2007, whereas the year 2008 and 2009 witnesses a decline in the increasing trend.

# International Journal of Enterprise Computing and Business Systems

ISSN (Online) : 2230-8849

<http://www.ijecbs.com>

Vol. 1 Issue 2 July 2011

---

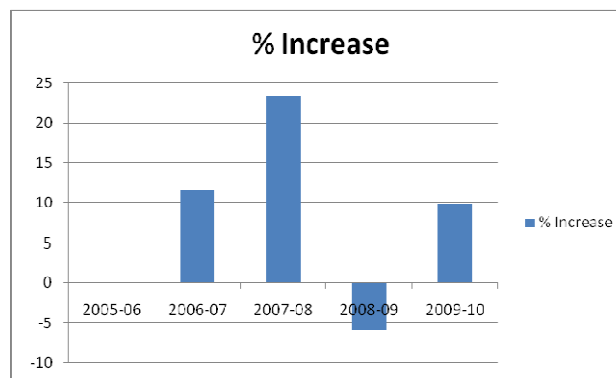
- As far as the trend percentage is concerned the value of transaction keeps on increasing at a steady pace over the period of 2005 to 2010 and it stands at three times over the base period.

**Table 1.9 showing the comparative analysis of value (Rs in 000) of other Payment System Indicators in terms of percentage**

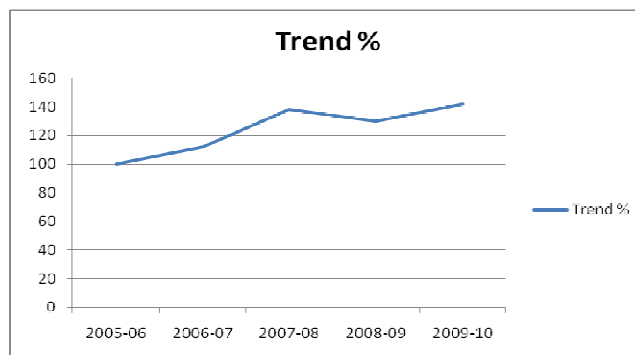
	2005-06	2006-07	2007-08	2008-09	2009-10
<b>Other Payment System Indicators</b>	6494087	7244112	8938039	8410857	9230684
<b>% Increase</b>	-	11.55	23.38	-5.90	9.75
<b>Trend %</b>	100	112	138	130	142

Source: Computed data

**Chart 1.11 showing the % increase of value of other Payment System Indicators**



**Chart 1.12 showing the trend of value of other Payment System Indicators**



**Inferences**

- As far as the other payment system indicators are concerned the value of transaction has decreased in the year 2008-09. In the rest of the years the value of transaction shows an incremental trend
- As far as the trend percentage is concerned the value of transaction keeps on increasing over the period of 2005 to 2010. The increment over the period of years is not as much as high

**Table 1.10 showing the comparative analysis of value (Rs in 000) of total Payment System Indicators in terms of percentage**

	2005-06	2006-07	2007-08	2008-09	2009-10

# International Journal of Enterprise Computing and Business Systems

ISSN (Online) : 2230-8849

<http://www.ijecbs.com>

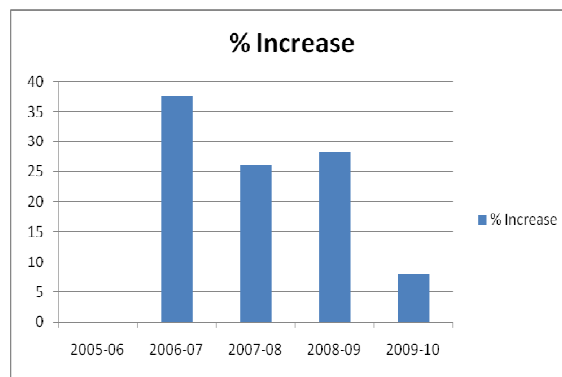
Vol. 1 Issue 2 July 2011

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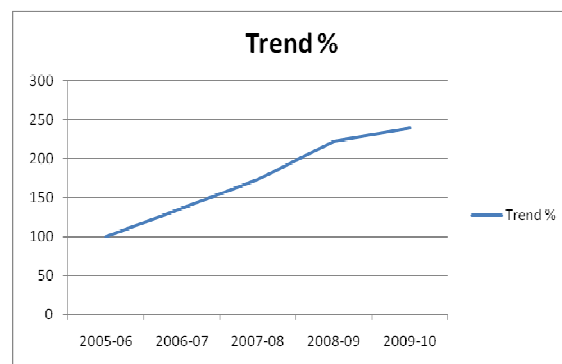
<b>Payment System Indicators</b>	30815285	42360389	53357502	68433413	73943807
<b>% Increase</b>	-	37.47	25.96	28.25	8.05
<b>Trend %</b>	100	137	173	222	240

Source: computed data

**Chart 1.13 showing the % increase of value of total Payment System Indicators**



**Chart 1.14 showing the trend of value of total Payment System Indicators**



## **Inferences**



# International Journal of Enterprise Computing and Business Systems

ISSN (Online) : 2230-8849

<http://www.ijecbs.com>

Vol. 1 Issue 2 July 2011

---

- In case of taking total payment system indicators, it is found that the value of transaction has been increased in decreasing trend over the period of 2006-2010. In 2009 & 2010 a marginal increment of 8% has been witnessed
- As far as the trend percentage is concerned the value of transaction keeps on increasing at a steady pace over the period of 2005 to 2010. The total value of transaction in the year 2009 & 2010 is 2.4 times over the base year of 2005-06

**Table 1.11 showing the volume (%) of paper based transactions and electronic based transactions in the payment and settlement systems from 2007 to 2010**

Volume	2007-08	2008-09	2009-10
Paper based transactions	72.9	67.2	64.7
Electronic transactions	27.1	32.8	35.3

Source: Reserve Bank of India

**Chart 1.15 showing the volume (%) of paper based transactions and electronic based transactions in the payment and settlement systems from 2007 to 2010**

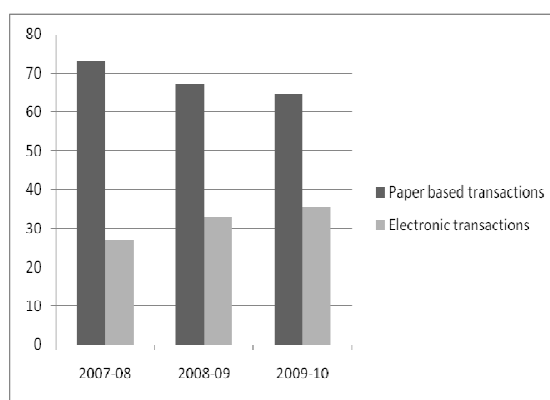
# International Journal of Enterprise Computing and Business Systems

ISSN (Online) : 2230-8849

<http://www.ijecbs.com>

Vol. 1 Issue 2 July 2011

---



## Inference

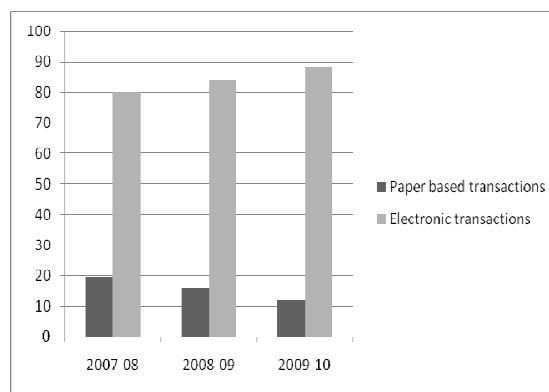
The above chart shows that the volume of transaction through electronic media has gained momentum during the period of 2007-2010 and it is implied that the share of paper based transaction is replaced with electronic mode of transaction

**Table 1.16 showing the value (%) of paper based transactions and electronic based transactions in the payment and settlement systems from 2007 to 2010**

Volume	2007-08	2008-09	2009-10
Paper based transactions	19.6	16.1	11.7
Electronic transactions	80.4	83.9	88.3

Source: Reserve Bank of India

**Chart 1.16 showing the value (%) of paper based transactions and electronic based transactions in the payment and settlement systems from 2007 to 2010**



**Inferences**

As far as the value of transaction is concerned, share of electronic transactions has significantly increased from the year 2007-2010. In the contrary the value of paper based transactions declined from the year 2007 to 2010.

**Conclusion**

Payment and settlement systems are an essential part of economic development and financial stability. Advances in information technology have made significant changes in payment channels across the globe. India, too is not the exception in using card based payments quiet some time and more recently internet and mobile phone based products and the use of these channels for transactions have been gaining popularity. Though the Indian financial system is characterised by the existence of traditional paper based mode, reforms initiated by the RBI over the period of time to introduce electronic payment products in order to ensure efficiency,

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**<http://www.ijecbs.com>**

**Vol. 1 Issue 2 July 2011**

---

speed and safety has brought about a significant improvement in facilitating payment and settlement systems. Yet the challenge to the RBI as a regulator is to tradeoff between innovations and integrity and safety of the payment system to uphold the interest of the users.

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