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Funding Of Small-Scale Development Agencies In Nigeria: A Case Study Of Industrial Development Centres(IDCs)

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Abstract

This study assessed the adequacy of funding of Industrial Development Centres (IDCs) in Nigeria. The study was designed primarily to determine whether or not the IDCs were adequately funded to carry out the roles assigned to them towards development of Small-Scale Businesses in Nigeria. The study indicated that each of the selected IDCs was not adequately funded to carry out the roles assigned to it towards the development of Small-Scale Businesses in the geographical areas it expected to offer its services. To overcome the problem of inadequate funding, it is recommended that IDCs should extend the sources of their funding.

Keywords: Small-Scale Businesses, funding, Industrial Development Centres, Zones.

1 Introduction

Before 1954, the Nigeran economy was mainly agrarian, both in production for domestic consumption and export. Industrialisation in Nigeria was anchored on making Nigeria producer of primary raw material for British industries and importer of British manufactured goods. Therefore, the task the first indigenous administration set for itself before attaining political independence was the transformation of the country into a modern economy. From 1954 until 1960 the Nigerian government pursued the program of processing of raw materials for export and Import Substitution Industries (ISIs). After early 1960s, the Nigerian government pursued the program of ISIs more vigorously than the processing of raw materials for export program.

The ISIs program pursued by the Nigerian Government was aimed at alleviating very specific problems within Nigeria. An example of such problems was the need to produce certain commodities within Nigeria. This program of industrialization was characterized by the establishment of few industries in urban centres.

However, the ISIs and export processing programs did not generate employment opportunities proportionally to the number of accumulating manpower. Even in the agricultural sector, the increase in agricultural output did not generate enough jobs for the unemployed. With improved health and welfare package financed by international agencies, the population of Nigeria was increasing at a rapid rate leading to further aggravation of the problems of unemployment and under-employment. Beside these problems, other problems that were being generated include economic disparities, undue concentration of wealth and powers in the hands of few people in the urban centres , wasteful utilisation of productive resources and mass migration of youths from rural areas to urban centres.

The aforementioned problems became more and more aggravated with the trend towards the centralisation of the country's public finance and expenditure from the mid 1960's when the Federal Government under the military assumed the position of the dominant financier of the nation's development projects most of which were large and cited in urban centres (CBN, 1975).

From 1970's onward the effects of ISIs program became glaringly manifested in the economy of the country. For example, Nigeria experienced a decline in Gross Domestic Product(GDP) as a result of weak manufacturing base, which was not export oriented and was mainly dependent on external influence (UNIDO, 1985). Also, during the oil

boom period of the 1970s, Nigeria had strong balance of payments, which led to inflation that was accompanied by gradual depreciation of Naira leading to higher cost of production in ISI sectors relative to imported goods. This phenomenon created excess demand over supply for goods in ISIs sector that manifested itself in substantial increase in importation of raw materials. Also the share of of expenditure on exports of capital goods and raw materials did not rise as the value of consumer imports declined(CBN,1982)

In order to address the various problems discussed above, the Federal and State governments decided to try an alternative industrialization strategy-the development of small-scale businesses- in the early 1970s. However, the government realized that the best way to develop small-scale businesses was to reduce or alleviate the problems facing the small-scale businesses. The governments also realized that the types of assistance needed by small-scale businesses if available from private consulting firms or larger industrial enterprises might entail cost beyond the capabilities of small-scale businesses. Therefore, since 1960s both Federal and State governments set up various programs and agencies to provide assistance to small-scale businesses in Nigeria. Industrial Development Centres(IDCs) were among the agencies set up by the Federal Government to render assistance to small- scale businesses in Nigeria. The IDCs were set up to provide assistance to small-scale businesses in the following areas: Selection of machinery and equipment for small-scale units, guidance on choice of technologies of production, guidance on choice of raw materials, advice on plant layout, installation of machinery and equipment, training of plant personnel on handling of improved machines, advice on product improvement, quality control and standardization, assistance on plant maintenance and repairs, advice on diversification of product mix, assistance to resolve operation problems, conduction of industry outlook surveys, feasibility studies and market surveys, identification of new small-scale businesses opportunities, designing of sales promotion and advertising campaigns, designing of book-keeping system for small-scale businesses, assisting of small-scale businesses owners on accounting and cost analysis, financial counseling, credit arrangement, and provision of training on: marketing management, personnel management, and product management and conduction of research studies on specific topics or problems. The IDCs are also to assist the states in the management and supervision of small-scale businesses throughout the federation.

2. Literature Review

Development literature may not agree on a single definition of small and medium scale businesses (SMBs), but there is some high level of consensus on the importance of SMBs roles in economic growth and development. A survey of the available empirical evidence indicated that a general tendency for small-scale businesses to be relatively more important in less developed countries (LDCs) including Nigeria than developed ones. Sutcliffe (1971) states that there is enormous number of very small firms and a small number of very large firms but there is a lack of mediumsized factory industry which is common in more industrialized countries. Staley and Morse (1965) asserted that small-scale industrialized activities will flourish when locational factors are such as to encourage the spatial dispersion of decentralization of such activities, as for example is the case with factories processing dispersed raw materials or supplying local market with a final product that is expensive to transport. Staley and Morse (op cit, 1965) further asserted that differentiated products having low scale economies and serving small total markets are likely to be produced in large number of small -establishments. Anderson (1982) posited that available empirical evidence suggests that a significant part of growth of large-scale enterprises are rooted in the expansion of once small firms. Sutcliffe (1971) claimed that small-scale businesses have several advantages. The advantages claimed following: They encourage entrepreneurship and economizing in its for such businesses include the use(Schatz, 1963). They are more likely to utilize labour intensive technologies than large – scale businesses and are more effective creators of direct employment opportunities(Sutcliffe). They can usually be rapidly established and put into operation to produce quick returns (Bryce, 1960). Their development can encourage the process of both inter and intra-regional industrialization. They can be located both in smaller urban centres and rural areas (Kilby, 1971). Their development can permit the development of wide and economic and social-political objective

According to Schmitz (1982), the potential of small-scale businesses is not always realized due to problems faced by indigenous enterprises which he classified as 'internal' constraints (relating to entrepreneurial competence) and 'external or environmental 'constraints

Realization of the advantages of small-scale businesses has made many countries to adopt strategies and options for development of small-scale businesses. The strategies and options adopted for development of small-scale businesses could be grouped into two broad categories: employment-oriented and laissez-faire.

2.1 Employment-oriented group:

Countries in this group include India, Indonesia, Malaysia and Nigeria. Small-Scale businesses in this group are usually accorded with support in financing, marketing, technical training, factory accommodation, etc free of charge or at subsidized costs (Akhauri, 1990). The government of India has provided some important inputs and supports for small- scale businesses over the past years. These include: The establishment of National Small- scale Industries Corporation (NSIC) for arranging machinery and other inputs on hire purchase; The establishment of Small Industries Extension Training Institute(SIET) for training extension officers and entrepreneurs; and the establishment of a network of Industrial Estates throughout the country by which sheds with necessary facilities were made available

Some of the important inputs and supports provided by the government of Indonesia over the past years include :The setting up of the Mini-industrial Estates (MIEs) designed to serve the Small-Industrial Enterprises by meeting their demands for raw materials and market promotion for their products; the development of programme for financial assistance to small-scale businesses; and the creation of clusters to promote and integrate assistance to small industrial enterprises in the same sector by buying raw materials for common stock and by supplying common equipment and facilities.

The inputs and supports provided for promotion and development of small- scale businesses by Malaysian government include: Provision of loans by public sector agencies such as the Majlis Amanah Rackyat(MARA) and Malaysian Industrial Development Finance Corporation (MIDC), etc; and establishment of institutions for development of entrepreneurship such as National Productivity Centre(NPC) and Industrial Training Institutes.

The Programmes which have been put forward by the Federal Government of Nigeria since early 1960's include: The creation of Industrial Development Centres(IDCs), Working For yourself/Entrepreneurship Development Programme WFYP/EDP, and National Economic and Reconstruction Fund(NERFUND) (Odetola, 2002)

2.2 Laissez-faire Approach

South Korea and Hong Kong have adopted this approach. Countries that have adopted this approach have specific reasons regarding the promotion of Small-Scale business sector at a particular point in time. By and large, market forces of supply and demand and competition between enterprises are stronger forces affecting the development of small –Scale business in the countries adopting this approach. For examples: The strategy of South Korea as at 1990 was clearly one of selective promotion- with the exception of those favoured Small-Scale Businesses that had to pay market cost of finance and other services; In Korea, from 1961 to 1963, the government policies towards development of small-scale businesses were aimed at establishing bodies charged with the responsibilities of promoting small – scale businesses and the enactment of laws to support the effective functioning of such bodies. Whereas from 1966 to1967, the government reviewed, integrated and systematized its policy towards the small-scale business sector. To do this, some lines of actions were taken, some of which include: The formation of the committee on financial assistance to small businesses to strive for co-operation among banking institutions for small industry financing; setting up of the council of small industry policy; and the use of foreign source of loans by small businesses to help them modernize their production facilities

2.3. What Drives Small-Scale Businesses in Nigeria?

In a study that comparatively assessed the individual impact of ten 'key factors' influencing business failure within the small and medium businesses sector between the United Kingdom (UK) and Nigeria, it was found that external factors such as poor economic conditions and inadequate infrastructure were the most crucial factors that influenced business failure in Nigeria(Ugwushi,2009). Omohezuaun and Inegbenebor(2009) asserted that the commonly adduced reasons for the inability of SMBs to meet the expectations of government in accelerating job creation, increase the production of goods and services, facilitate technology transfer, create more opportunities for entrepreneurs and in particular, increase the local content component of the giant multinational companies in Nigeria were lack of access to credit facilities. According to Isaac et al(2005), the reasons for lack of access credit facilities are: (i) SMBs are regarded by creditors and investors as high-risk borrowers because of insufficient assets and low - capitalisation, vulnerability to market fluctuations and high mortality rates; (ii) information asymmetry arising from SMBs' lack of accounting records, inadequate accounting statements or business plans makes it difficult for creditors and investors to access the creditworthiness of potential SMBs proposals; and (iii) high administrative/transaction costs of lending or investing small amounts do not make SMB financing a profitable business'.

3. Statement of research problem

Looking at the functions the IDCs were saddled with, one can conclude that if the IDCs had really carried out their assigned functions, their impacts on performance of small-scale businesses would have been positive and meaningful

The Federal Government has since 1960s spent a lot of money on the establishment and running of the IDCs in the federation. For example, the Federal Government has provided workshops, machines, and other amenities like motor vehicles running to several millions of Naira. The Federal Government , on average spends more than N500,000 per quarter on the smallest IDCs in the Federation. In 1997, the Federal Government expended N39 million to strengthen three centres of IDCs in the Federation, N81 million on the development of the other IDCs (Budget, 1997)

Despite the enormous amount expended on the IDCs over the past years it is surprising that many staff of the IDCs have claimed that the IDCs were not adequately funded for the functions they were expected to offer towards the development of small-scale businesses

A critical look at the scenario depicted so far would indicate that there is need to embark on a study to verify whether or not the IDCs were adequately funded.

4. Research Objective

The study aims at determining whether or not the IDCs were adequately funded **5. Research Setting:**

Twelve IDCs were chosen for this study. These were made up of three IDCs in each of the four zones in Nigeria: North Western, North Eastern, South Eastern, and South Western zones The IDCs in each zone included the biggest centre and two of the smaller centres in the zone.

6. Research Methodology

Based on the research objective, the null hypothesis formulated is: The IDCs were not adequately funded to carry out the functions assigned to them towards the development of small-scale businesses.

The data collected on financial need or requirement of the IDCs and the actual amount received from the funder (Federal Ministry of Industry) were used to test the hypothesis (see Tables 2-5)

. In selecting the IDCs, a sampling frame was obtained by listing all the IDCs in Nigeria. The frame was divided into geographic locations and sizes of the centres. The geographic locations were grouped into four basic zones-North Western / Central, North Eastern, South Eastern and South Western zones. The selection included the three biggest centres (these were designated as X_1, X_2, X_3 , and X_4), and nine of the smaller centres(These were designated as $Y_1, Y_2, Y_3, Y_4, Z_1, Z_2, Z_3$ and Z_4). The smaller IDCs were selected by judgmental sampling method. E-Views 7 Software was used to test the hypothesis formulated for the study.

7. Results and Discussion:

The summary results of the findings of the study are presented in Table 1(See details in Tables 2-5. From 1990 to 1999 the three IDCs($X_1, Y_1, and Z_1$) in the North Central/North Western zone, received N68.764 million(54.21%) out of a total sum of N126.843 million required from their supervising ministry. During the same period, IDCX₁ received N44.599(54.02%) out of N82,554 million required; IDCY₁ received N10.481 million(N55.89%) out of N18.753 million required; and IDCZ₁ received N13.772 million(53.93%) out of N25.537 million required.

From 1990 to 1999 the three IDCs(X_2 , Y_2 ,and Z_2) in the North Eastern zone, received N35.29 million(54.75%) out of a total sum of N64.453 million required from their supervising ministry. During the same period, IDCX₂ received N15.541 million(54.82%) out of N28.347required; IDCY₂ received N14.22 million53.76%) out of N26.449 million required; and IDCZ₂ received N4.226 million(43.86%) out of N9.636 million required.

From 1990 to 1999 the three IDCs(X_3 , Y_3 , and Z_3) in the South Eastern zone, received N N61.856 million(54.61% out of a total sum of N113,292 million required from their supervising ministry. During the same period, IDCX₃ received N4.182(53.77%)out of N76.583 million required; IDCY₃ received N5.408 million((56.98%)) out of N9.491 million required; and IDCZ₃ received N15,297 million(56.16%) out of N27.238 million required.

From 1990 to 1999 the three $IDCs(X_4, Y_4, and Z_4)$ in the South Western zone, received N85.75 million(51.08%) out of a total sum of N167.858 million required from their supervising ministry. During the same period, $IDCX_4$ received N57.941 million(50.73%) out of N114.215million required; $IDCY_4$ received N12.53 million(51.97%) out of N24.111 million1required; and $IDCZ_4$ received N15.279 million(51.74%) out of N29.531 million required.

Interviews of IDCs' staff indicated that all selected IDCs received financial allocation several days after the commencement of the quarters the allocations were supposed to cater for during the period covered by the study. Interaction with staff of the Federal Ministry of Industries indicated the following :(1). Substantial part of fund (specifically allocated to the IDCs by the government via the Supervising Ministry of the IDCs) were always diverted to the other needs of the supervising Ministry; and (2). the Supervising Ministry of the IDCs always released Authority to incur Expenditure(AIE) and Cash Backing(CB) which the Central Bank of Nigeria required before honouring cheques issued by the Federal pay offices to the IDCs in respect of financial allocations.

Table 6 shows summary of the results of the hypothesis (See the detailed results in tables 7-18)

At 5% level ,T-test, Satterthwaite t-test, Anova F-test, and Welch-test indicate that there was significant difference between the amount required and amount received by each of the selected IDCs during the period covered by the study.

8. Summary and Conclusion

The study attempts to assess the roles and constraints of small-scale businesses development programs which the Federal and state governments of Nigeria have put in place since 1960s. The results of the study show that none of the IDCs was supplied with adequate annual financial resources during the period covered by the study. The root causes of lack of adequate supply of resources are: (1). Diversion of substantial part of fund allocated to the IDCs via the Supervising Ministry of the IDCs to the other priority needs of the Supervising Ministry which the Federal Government ought to allocate fund for; and (2). Late releases by the Supervising Ministry of the IDCs of Authority to incur Expenditure(AIE) and Cash Backing(CB) which the Central Bank of Nigeria required before honouring cheques issued by the Federal pay offices to the IDCs in respect of financial allocations.

9. Recommendations

To address the problem of lack of adequate funding, it is recommended that funding of the IDCs should be sourced from varieties of sources. It is advisable that IDCs should be semi-public bodies with autonomy capable of attracting their own funding. It is suggested that the funding should be sourced from the following: (1). Subsidies from government budget; (2) Subsidies from specific taxes on business organizations in the country similar to education taxes being levied on business organisations in the country; (3) Fees from beneficiaries of the IDCs' services; (4). Contribution from National Association of Small- Scale Industrialists; and (5). Grants from foreign donors and International Organisations.

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Table 1: Summary of amount required by the IDCs and the amount received from Federal Ministry of Industry, *Abuja*

Zones/IDCs	es/IDCs Amount required/received and % of requirement met										
North Central/North	Required in million	Received in million	% of requirement								
Western	naira	Naira	Met								
X ₁	82.554	44.599	54.02								
Y ₁	18.753	10.481	55.89								
Z ₁	25.537	13.772	53.93								
Sub –total	126.843	68.764	54.21								
North Eastern											
X ₂	28.347	15.541	54.82								
Y ₂	26.449	14.22	53.76								
Z ₂	9.636	4.226	43.86								
Subtotal	64.453	35.29	54.8								
South Eastern											
Y ₃	76.583	41.182	53.77								
Y ₃	9.491	5.408	56.98								
Z ₃	27.238	15.297	56.16								
Sub-total	113.292	61.856	54.61								
South western											
X ₄	114.215	57.941	50.73								
Y ₄	24.111	12.53	51.97								
Z_4			51.74								
	29.531	15.279	51.74								
Sub-total	167.858	85.75	51.08								
Grand Total	472.446	251.66	53.27								

Source: Researcher's Survey

Table 2: Amount required by the IDCs in the North Western/Central Zone and the amount received from Federal Ministry of Industry, Abuja

	Amount required by the IDCs and amount received from Federal Ministry in million Naira											
Year	Year IDC X ₁ IDC Y ₁			ID	CZ ₁		Total					
	Required	Received	% Of Requirement met	Required	Received	% Of Requirement met	Required	Received	% Of Requirement	Required	Received	%Of Requirement met
1990	3.473	2.145	61.8	0.916	0.590	64.4	1.252	0.799	63.8	5.641	3.534	62.6
1991	3.837	2.414	62.9	1.035	0.647	62.5	1.415	0.885	62.5	6.287	3.947	62.8
1992	4.487	2.684	59.8	1.122	0.697	62.1	1.534	0.931	60.7	7.143	4.312	60.4
1993	5.438	3.232	59.4	1.217	0.725	59.6	1.665	0.984	59.1	8.320	4.941	59.4
1994	6.698	3.680	54.9	1.702	0.975	57.3	2.237	1.352	60.4	10.637	6.007	56.5
1995	7.943	4.560	57.4	1.846	1.038	56.2	2.524	1.359	53.8	12.313	6.957	56.5
1996	10.032	4.973	49.6	2.003	1.043	52.1	2.738	1.368	50.0	14.772	7.384	50.0
1997	10.098	4.215	41.7	2.172	0.938	43.2	2.969	1.237	41.7	15.239	6.390	41.9
1998	10.927	4.851	44.4	2.358	1.149	48.7	3.219	1.261	39.2	16.504	7.262	44.0
1999	19.621	11.845	60.4	4.382	2.679	61.1	5.984	3.596	60.1	29.987	18.030	60.1
Total	82.554	44.599	54.02	18.753	10.481	55.89	25.537	13.772	53.93	126.843	68.764	54.21

Source: Researcher's Survey

Table 3: Amount required by the IDCs in the North Eastern Zone and the amount received fromFederal Ministry of Industry, Abuja

	Amount required by the IDCs and amount received from Federal Ministry in million Naira											
Year	ID	C X ₂		IDC Y ₂			II	DC Z ₂		Total		
	Required	Received	% Of Requirement met	Required	Received	% Of Requirement met	Required	Received	% Of Requirement met	Required	Received	% Of Requirement
1990	1.556	0.934	60.0	1.517	0.924	60.9	0.556	0.366	65.8	3.630	2.225	61.3
1991	1.728	1.037	60.0	1.687	1.007	59. 7	0.609	0.398	65.4	4.024	2.442	60.7
1992	1.878	1.110	59.1	1.843	1.086	58.9	0.660	0.437	66.2	4.381	2.633	60.1
1993	2.073	1.204	58.1	1.994	1.166	58.5	0.716	0.462	64.5	4.784	2.832	59.2
1994	2.716	1.513	55.7	2.386	1.332	55.8	0.834	0.551	66.1	5.936	3.396	57.2
1995	2.813	1.477	52.5	2.552	1.377	54.0	0.900	0.492	54.7	6.265	3.346	53.4
1996	3.003	1.366	45.5	2.784	1.264	45.4	0.981	0.517	52.7	6.788	3.148	46.4
1997	3.165	1.390	43.9	3.016	1.211	40.2	1.069	0.471	44.1	7.249	3.072	42.4
1998	3.339	1.397	41.8	3.271	1.316	40.2	1.159	0.532	45.9	7.769	3.245	41.8
1999	6.076	4.113	67.7	5.399	3.537	65.5	2.152	1.301	60.5	13.627	8.951	65.7
Total	28.347	15.541	54.82	26.449	14.22	53.76	9.636	4.226	43.86	64.453	35.29	54.75

Source: Researcher's Survey.

Table 4: Amount required by the IDCs in the South Eastern Zone and the amount received fromFederal Ministry of Industry, Abuja

	Amount required by the IDCs and amount received from Federal Ministry in million Naira											
Year	IDC	X ₃		IDC Y ₃			II	IDC Z ₃				
	Required	Received	% Of Requirement met	Required	Received	% Of Requirement	Required	Received	% Of Requirement	Required	Received ved	% Of Requirement met
1990	3.249	2.048	63.0	0.480	0.336	70.0	1.343	0.912	67.9	5.072	3.295	65.0
1991	3.539	2.247	63.5	0.528	0.356	67.4	1.518	1.015	66.9	5.585	3.618	64.8
1992	4.119	2.552	61.9	0.573	0.384	67.0	1.646	1.096	66.6	6.338	4.032	63.6
1993	5.001	3.033	60.7	0.621	0.408	65.7	1.784	1.200	67.2	7.406	4.620	62.4
1994	6.159	3.503	56.9	0.859	0.539	62.7	2.464	1.519	61.6	9.482	5.561	58.6
1995	7.876	4.152	52.7	0.931	0.528	56.7	2.692	1.480	54.9	11.479	6.160	53.7
1996	8.760	4.550	51.9	1.009	0.546	54.1	2.898	1.550	53.5	12.667	6.646	52.5
1997	9.241	3.923	42.5	1.095	0.469	42.8	3.143	1.323	42.1	13.479	5.716	42.4
1998	10.668	4.437	41.6	1.187	0.514	43.3	3.409	1.438	42.2	15.264	6.389	41.9
1999	17.971	10.737	59. 7	2.208	1.328	60.1	6.341	3.764	59.4	26.520	15.829	59. 7
Total	76.583	41.182	53.77	9.491	5.408	56.98	27.238	15.297	56.16	113.292	61.866	54.61

Source: Researcher's Survey

Table 5: Amount required by the IDCs in the South Western Zone and the amount receive from Federal Ministry of Industry, Abuja

	Amount required by the IDCs and amount received from Federal Ministry in million Naira											
Year	IDC X ₄			IDC Y ₄			IDC Z ₄			Total		
	Required	Received	% Of Requirement met	Required	Received	% Of Requirement met	Required	ReceiVed	% Of Requirement met Ce	Required	Received	% Of Requirement met
1990	3.804	2.290	60.2	1.237	0.799	64.6	1.515	0.9518	62.8	6.557	4.040	61.6
1991	4.535	2.750	60.6	1.341	0.837	62.4	1.643	0.9864	60.0	7.519	4.574	60.8
1992	5.783	3.445	59.6	1.454	0.883	60.7	1.782	1.075	60.3	9.019	5.403	59.9
1993	7.327	4.300	58.7	1.577	0.924	58.6	1.932	1.147	59.4	10.836	6.371	58.8
1994	8.917	4.638	52.0	2.179	1.181	54.2	2.665	1.399	52.5	13.761	7.218	52.5
1995	11.889	6.045	50.8	2.363	1.227	51.9	2.894	1.504	52.0	17.146	8.777	51.2
1996	14.358	6.663	46.4	2.562	1.193	46.6	3.138	1.416	45.1	20.059	9.272	46.2
1997	15.411	5.726	37.2	2.779	1.109	39.9	3.404	1.275	37.5	21.594	8.110	37.6
1998	16.638	6.456	38.8	3.014	1.029	34.1	3.692	1.413	38.2	23.343	8.897	38.1
1999	25.553	15.628	61.2	5.605	3.348	59. 7	6.866	4.112	60.0	38.024	23.088	60.7
Total	114.215	57.941	50.73	24.111	12.53	51.97	29.531	15.2792	51.74	167.858	85.75	51.08

Source: Researcher's Survey

	Probability for each	of the tests		
IDCs	t-test	Satterhthwaite-	Anova F-test	Welch F-test*
		Welch t-test*		
X ₁	0.0451	0.0488	0.0451	0.0451
Y ₁	0.0400	0.0431	0.0400	0.0431
Z_1	0.0326	0.0357	0.0326	0.0357
X ₂	0.0206	0.0218	0.0208	0.0218
Y ₂	0.0107	0.0118	0.0107	0.0118
Z_2	0.0260	0.0288	0.0260	0.0288
X ₃	0.0412	0.0450	0.0412	0.0450
Y ₃	0.0401	0.0435	0.0401	0.0438
Z ₃	0.0368	0.0405	0.0368	0.0405
X ₄	0.0339	0.0375	0.0339	0.0375
Y ₄	0.0244	0.0272	0.0244	0.0272
Z_4	0.0241	0.0268	0.0241	0.0268

Table 6:Summary of test of Equality of Means Between Series for all selected IDCs

Table 7:Test for Equality of Means Between Series for IDC X_1 Date: 04/20/12 Time: 11:28 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability	
t-test	18	-2.152764	0.0451	
Satterthwaite-Welch t-test*	14.39175	-2.152764	0.0488	
Anova F-test	(1, 18)	4.634394	0.0451	
Welch F-test*	(1, 14.3918)	4.634394	0.0488	

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	72.02910 279.7613	72.02910 15.54229
Total	19	351.7904	18.51528

Category Statistics

				Std. Err.
Variable	Count	Mean	Std. Dev.	of Mean
RECEIVED	10	4.459900	2.785682	0.880910
REQUIRED	10	8.255400	4.829551	1.527238
All	20	6.357650	4.302939	0.962166

Table8:Test for Equality of Means Between Series for IDCY₁ Date: 04/20/12 Time: 11:36 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability	
t-test	18	-2.213865	0.0400	
Satterthwaite-Welch t-test*	14.66410	-2.213865	0.0431	
Anova F-test	(1, 18)	4.901198	0.0400	
Welch F-test*	(1, 14.6641)	4.901198	0.0431	

Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	3.421299 12.56496	3.421299 0.698054
Total	19	15.98626	0.841382

				Std. Err.
Variable	Count	Mean	Std. Dev.	of Mean
RECEIVED	10	1.048100	0.604245	0.191079
REQUIRED	10	1.875300	1.015379	0.321091
All	20	1.461700	0.917269	0.205108

Table 9:Test for Equality of Means Between Series for IDCZ1 Date: 04/20/12 Time: 11:40 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.315963	0.0326
Satterthwaite-Welch t-test*	14.48044	-2.315963	0.0357
Anova F-test	(1, 18)	5.363684	0.0326
Welch F-test*	(1, 14.4804)	5.363684	0.0357

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	6.920761 23.22540	6.920761 1.290300
Total	19	30.14616	1.586640

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	1.377200	0.808810	0.255768
REQUIRED	10	2.553700	1.387958	0.438911
All	20	1.965450	1.259619	0.281659

Table 10:Test for Equality of Means Between Series for IDCX₂ Date: 04/20/12 Time: 12:02 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	2.538471	0.0206
Satterthwaite-Welch t-test*	16.18765	2.538471	0.0218
Anova F-test	(1, 18)	6.443833	0.0206
Welch F-test*	(1, 16.1877)	6.443833	0.0218

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	8.190720 22.87970	8.190720 1.271094
Total	19	31.07042	1.635285

Category Statistics

				Std. Err.
Variable	Count	Mean	Std. Dev.	of Mean
RECEIVED	10	2.834700	1.302461	0.411874
REQUIRED	10	1.554800	0.919665	0.290824
All	20	2.194750	1.278783	0.285945

Table 11: Test for Equality of Means Between Series for IDCY₂ Date: 04/20/12 Time: 17:13 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.844982	0.0107
Satterthwaite-Welch t-test*	15.73850	-2.844982	0.0118
Anova F-test	(1, 18)	8.093923	0.0107
Welch F-test*	(1, 15.7385)	8.093923	0.0118

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	7.477422 16.62897	7.477422 0.923832
Total	19	24.10639	1.268757

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	1.422000	0.757388	0.239507
REQUIRED	10	2.644900	1.128728	0.356935
All	20	2.033450	1.126391	0.251869

Table 12:Test for Equality of Means Between Series for $IDCZ_2$ Date: 04/20/12 Time: 17:37Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.426638	0.0260
Satterthwaite-Welch t-test*	14.46504	-2.426638	0.0288
Anova F-test	(1, 18)	5.888570	0.0260
Welch F-test*	(1, 14.465)	5.888570	0.0288

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	0.844194 2.580507	0.844194 0.143361
Total	19	3.424701	0.180247

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	0.552700	0.269242	0.085142
REQUIRED	10	0.963600	0.462852	0.146367
All	20	0.758150	0.424556	0.094934

Table 13:Test for Equality of Means Between Series for IDC X_3 Date: 04/20/12 Time: 12:58 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.198511	0.0412
Satterthwaite-Welch t-test*	14.16151	-2.198511	0.0450
Anova F-test	(1, 18)	4.833450	0.0412
Welch F-test*	(1, 14.1615)	4.833450	0.0450

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	62.66154 233.3546	62.66154 12.96414
Total	19	296.0161	15.57980

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	4.118200	2.492925	0.788332
REQUIRED	10	7.658300	4.440001	1.404052
All	20	5.888250	3.947125	0.882604

Table 14: Test for Equality of Means Between Series for Y_3

Date: 04/20/12 Time: 13:07 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.212404	0.0401
Satterthwaite-Welch t-test*	14.23226	-2.212404	0.0438
Anova F-test	(1, 18)	4.894734	0.0401
Welch F-test*	(1, 14.2323)	4.894734	0.0438

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	0.833544 3.065295	0.833544 0.170294
Total	19	3.898839	0.205202

Category Statistics

				Std. Err.
Variable	Count	Mean	Std. Dev.	of Mean
RECEIVED	10	0.540800	0.287531	0.090925
REQUIRED	10	0.949100	0.507852	0.160597
All	20	0.744950	0.452992	0.101292

Table 15:Test for Equality of Means Between Series for Z_3 Date: 04/20/12 Time: 13:19 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.255601	0.0368
Satterthwaite-Welch t-test*	14.10981	-2.255601	0.0405
Anova F-test	(1, 18)	5.087736	0.0368
Welch F-test*	(1, 14.1098)	5.087736	0.0405

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	7.129374 25.22315	7.129374 1.401286
Total	19	32.35252	1.702764

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RCEIVED	10	1.529700	0.815781	0.257973
REQUIRED	10	2.723800	1.461873	0.462285
All	20	2.126750	1.304900	0.291785

Table 16:Test for Equality of Means Between Series for $IDCX_4$ Date: 04/20/12 Time: 13:30Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.296212	0.0339
Satterthwaite-Welch t-test*	14.12012	-2.296212	0.0375
Anova F-test	(1, 18)	5.272589	0.0339
Welch F-test*	(1, 14.1201)	5.272589	0.0375

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	158.3382 540.5479	158.3382 30.03044
Total	19	698.8860	36.78348

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	5.794100	3.780046	1.195355
REQUIRED	10	11.42150	6.765510	2.139442
All	20	8.607800	6.064938	1.356161

Table 17:Test for Equality of Means Between Series for IDCY₄ Date: 04/20/12 Time: 13:34 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.456217	0.0244
Satterthwaite-Welch t-test*	14.50544	-2.456217	0.0272
Anova F-test	(1, 18)	6.033001	0.0244
Welch F-test*	(1, 14.5054)	6.033001	0.0272

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	6.705978 20.00789	6.705978 1.111549
Total	19	26.71387	1.405993

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	1.253000	0.752308	0.237901
REQUIRED	10	2.411100	1.287296	0.407079
All	20	1.832050	1.185746	0.265141

Table 18:Test for Equality of Means Between Series Z_4 Date: 04/20/12 Time: 13:38 Sample: 1990 1999 Included observations: 10

Method	df	Value	Probability
t-test	18	-2.462780	0.0241
Satterthwaite-Welch t-test*	14.57143	-2.462780	0.0268
Anova F-test	(1, 18)	6.065286	0.0241
Welch F-test*	(1, 14.5714)	6.065286	0.0268

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between Within	1 18	10.15569 30.13912	10.15569 1.674396
Total	19	40.29481	2.120780

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
RECEIVED	10	1.527920	0.928545	0.293632
REQUIRED	10	2.953100	1.576895	0.498658
All	20	2.240510	1.456290	0.325636

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