

PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ

FACULTAD DE CIENCIAS E INGENIERÍA



PONTIFICIA
UNIVERSIDAD
CATÓLICA
DEL PERÚ

MODELO DE PRONÓSTICO DE DEMANDA DE EFECTIVO PARA LAS OFICINAS DE UNA ENTIDAD BANCARIA EN UNA CIUDAD DEL INTERIOR DEL PAIS

Tesis para optar el Título de Ingeniería Industrial, que presenta el bachiller:

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ANEXO 1

Oficinas según zona y región.

Fuente: Reporte ASBANC

EVOLUCION DEL NUMERO DE OFICINAS A NIVEL DE REGIONES Y DEL EXTERIOR SISTEMA BANCARIO DICIEMBRE 2008 – DICIEMBRE 2012

I. NUMERO

REGIONES	DEPARTAMENTOS	dic-08	dic-09	dic-10	dic-11	dic-12
Nor Este	Loreto	13	16	16	17	20
Nor Oeste	Tumbes, Piura, Lambayeque, La Libertad, Cajamarca, Amazonas y San Martín	205	214	216	227	256
Sur Este	Cusco, Puno, Ayacucho, Madre de Dios y Apurímac	56	59	58	67	71
Sur Oeste	Ica, Arequipa, Moquegua y Tacna	117	124	129	148	158
Centro	Ancash, Ucayali, Junín, Huánuco, Pasco y Huancavelica	88	94	95	93	104
Lima	Lima y Callao	969	987	1,009	1,047	1,158
TOTAL NIVEL NACIONAL		1,448	1,494	1,523	1,599	1,767
TOTAL EXTERIOR		3	3	4	4	4
TOTAL		1,451	1,497	1,527	1,603	1,771

II. PARTICIPACION

REGIONES	DEPARTAMENTOS	dic-08	dic-09	dic-10	dic-11	dic-12
Nor Este	Loreto	0.9%	1.1%	1.0%	1.1%	1.1%
Nor Oeste	Tumbes, Piura, Lambayeque, La Libertad, Cajamarca, Amazonas y San Martín	14.1%	14.3%	14.1%	14.2%	14.5%
Sur Este	Cusco, Puno, Ayacucho, Madre de Dios y Apurímac	3.9%	3.9%	3.8%	4.2%	4.0%
Sur Oeste	Ica, Arequipa, Moquegua y Tacna	8.1%	8.3%	8.4%	9.3%	8.9%
Centro	Ancash, Ucayali, Junín, Huánuco, Pasco y Huancavelica	6.1%	6.3%	6.2%	5.8%	5.9%
Lima	Lima y Callao	66.8%	65.9%	66.1%	65.5%	65.5%
TOTAL NIVEL NACIONAL		99.8%	99.8%	99.7%	99.8%	99.8%
TOTAL EXTERIOR		0.2%	0.2%	0.3%	0.2%	0.2%
TOTAL		100.0%	100.0%	100.0%	100.0%	100.0%

III. VARIACION DEL NUMERO DE OFICINAS

REGIONES	DEPARTAMENTOS	Dic-09 / Dic-08	Dic-10 / Dic-09	Dic-11 / Dic-10	Dic-12 / Dic-11
Nor Este	Loreto	23.1%	0.0%	6.3%	17.6%
Nor Oeste	Tumbes, Piura, Lambayeque, La Libertad, Cajamarca, Amazonas y San Martín	4.4%	0.9%	5.1%	12.8%
Sur Este	Cusco, Puno, Ayacucho, Madre de Dios y Apurímac	5.4%	-1.7%	15.5%	6.0%
Sur Oeste	Ica, Arequipa, Moquegua y Tacna	6.0%	4.0%	14.7%	6.8%
Centro	Ancash, Ucayali, Junín, Huánuco, Pasco y Huancavelica	6.8%	1.1%	-2.1%	11.8%
Lima	Lima y Callao	1.9%	2.2%	3.8%	10.6%
TOTAL NIVEL NACIONAL		3.2%	1.9%	5.0%	10.5%
TOTAL EXTERIOR		0.0%	33.3%	0.0%	0.0%
TOTAL		3.2%	2.0%	5.0%	10.5%

EVOLUCION DEL NUMERO DE OFICINAS A NIVEL NACIONAL

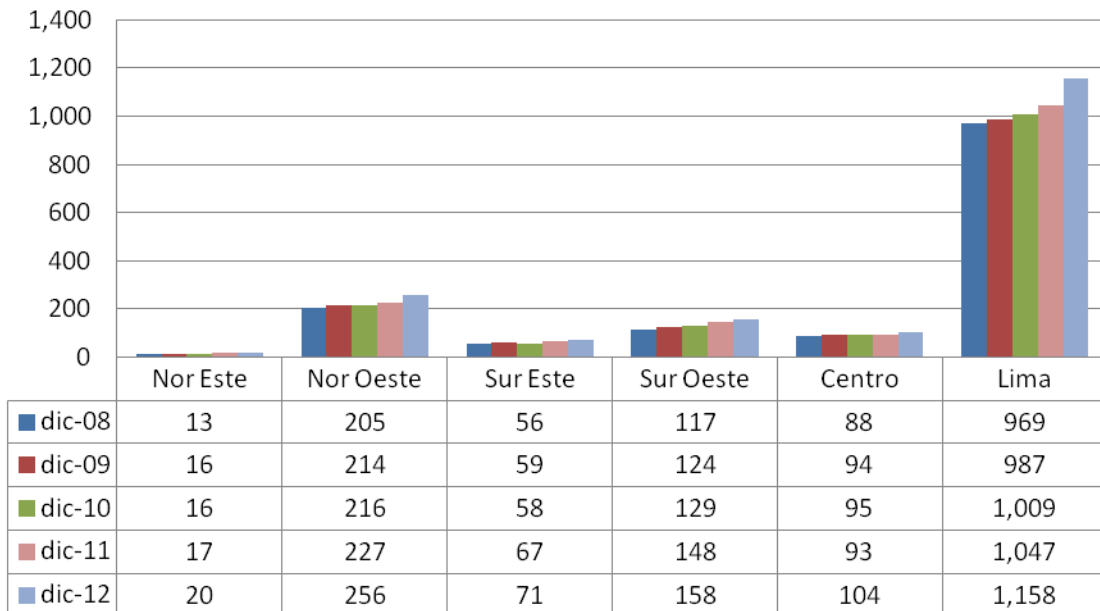


Gráfico. Evolución del número de oficinas a nivel nacional
Fuente: Departamento de Estadística de la ASBANC

EVOLUCION DE LA PARTICIPACION DEL NUMERO DE OFICINAS A NIVEL NACIONAL

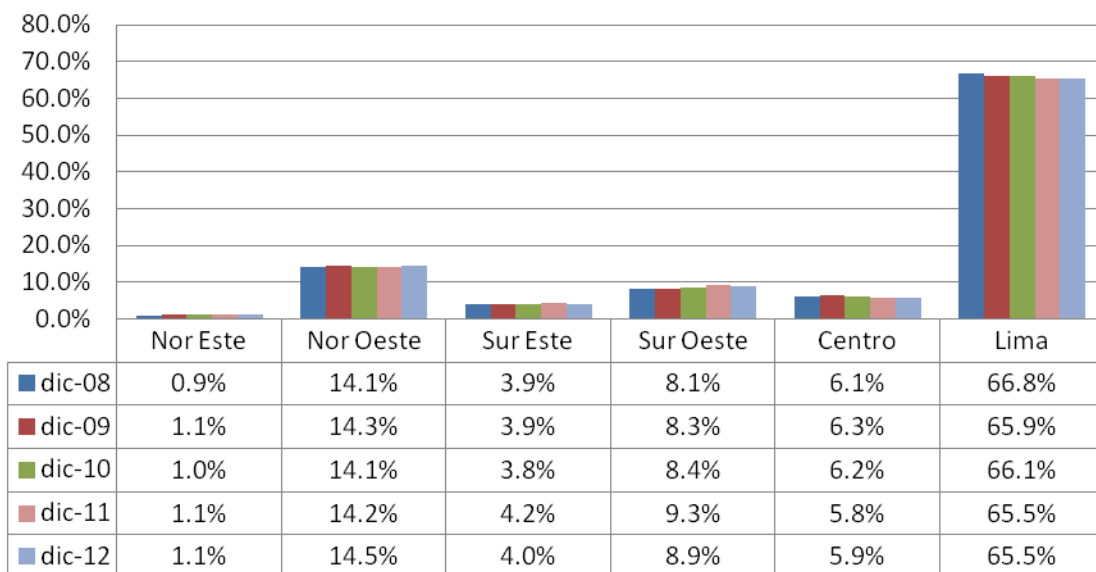


Gráfico. Evolución de la participación del número de oficinas a nivel nacional
Fuente: Departamento de Estadística de la ASBANC

EVOLUCION DE LA VARIACION DEL NUMERO DE OFICINAS A NIVEL NACIONAL

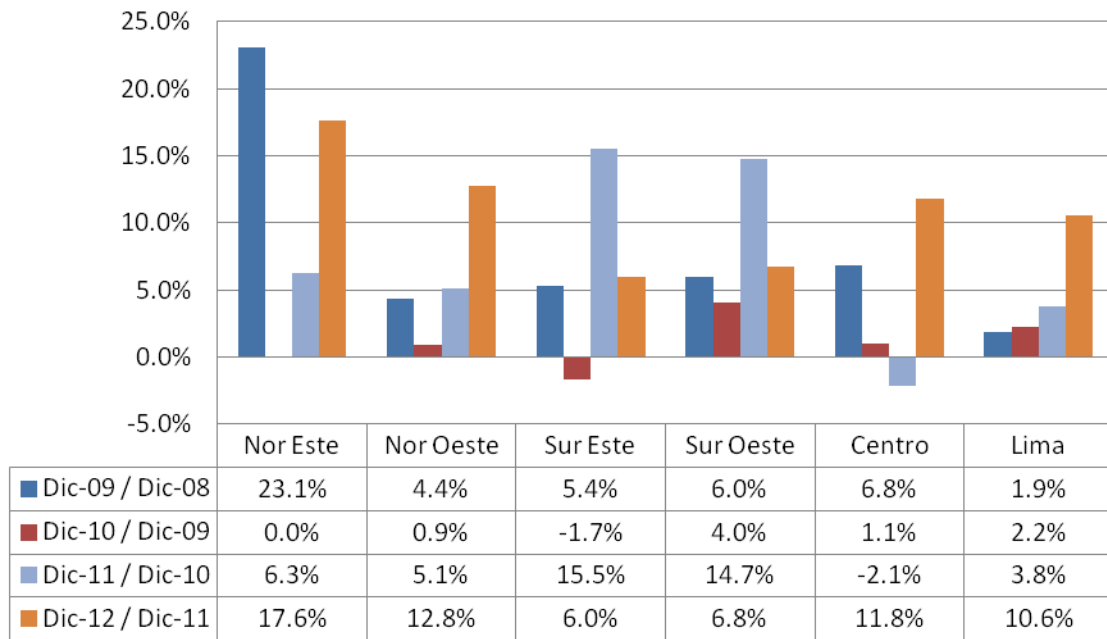


Gráfico. Evolución de la variación del número de oficinas a nivel nacional
Fuente: Departamento de Estadística de la ASBANC



ANEXO 2

Detalle de predicción y residuales para una oficina mixta

Fuente: *Elaboración propia*

Fecha	Consumo Cajeros	Flujo Clientes	Demanda Real	Predicción	Residual	Porcentaje
02-ene	584,130	232,733	584,130	586,552	2,422	0.41%
03-ene	497,180	-730,353	1,227,533	1,250,310	22,777	1.86%
04-ene	1,009,940	-3,595,067	4,605,007	2,514,096	-2,090,911	45.41%
05-ene	393,690	-3,726,657	4,120,347	1,890,665	-2,229,683	54.11%
06-ene	1,311,930	2,005,133	1,311,930	1,396,712	84,782	6.46%
07-ene	948,090	1,153,852	948,090	902,488	-45,602	4.81%
09-ene	741,650	740,948	741,650	710,045	-31,605	4.26%
10-ene	453,330	352,467	453,330	439,590	-13,740	3.03%
11-ene	-	600,380	-	-	-	
12-ene	1,507,380	257,443	1,507,380	1,567,363	59,983	3.98%
13-ene	238,770	501,353	238,770	188,883	-49,887	20.89%
14-ene	900,280	674,189	900,280	849,383	-50,897	5.65%
16-ene	803,330	-148,928	952,258	957,407	5,149	0.54%
17-ene	831,380	407,545	831,380	816,883	-14,497	1.74%
18-ene	-	779,796	-	-	-	
19-ene	283,180	629,799	283,180	251,900	-31,280	11.05%
20-ene	583,980	465,537	583,980	541,336	-42,644	7.30%
21-ene	1,080,780	686,017	1,080,780	1,021,761	-59,019	5.46%
23-ene	1,350,070	1,615,803	1,350,070	1,433,837	83,767	6.20%
24-ene	1,143,290	1,520,984	1,143,290	1,262,732	119,442	10.45%
25-ene	2,016,640	1,768,428	2,016,640	1,836,958	-179,682	8.91%
26-ene	1,829,820	458,710	1,829,820	1,747,900	-81,920	4.48%
27-ene	2,463,380	2,163,070	2,463,380	1,997,671	-465,709	18.91%
28-ene	1,416,310	1,914,067	1,416,310	1,481,931	65,621	4.63%
30-ene	599,470	30,521	599,470	665,930	66,460	11.09%
31-ene	1,649,990	235,042	1,649,990	1,678,286	28,296	1.71%
01-feb	1,142,290	-849,836	1,992,126	2,062,603	70,476	3.54%
02-feb	880,330	-1,610,125	2,490,455	2,398,239	-92,216	3.70%
03-feb	759,560	831,033	759,560	703,888	-55,672	7.33%
04-feb	758,600	1,085,989	758,600	718,396	-40,204	5.30%
06-feb	854,630	1,826,939	854,630	879,463	24,833	2.91%
07-feb	1,243,940	320,431	1,243,940	1,271,428	27,488	2.21%
08-feb	-	-312,628	312,628	281,732	-30,897	9.88%
09-feb	250,600	752,723	250,600	219,303	-31,297	12.49%

10-feb	1,119,290	931,496	1,119,290	1,049,913	-69,377	6.20%
11-feb	617,790	682,721	617,790	571,556	-46,234	7.48%
13-feb	1,143,300	276,002	1,143,300	1,130,872	-12,428	1.09%
14-feb	-	800,138	-	-	-	
15-feb	-	93,531	-	-	-	
16-feb	1,572,410	502,702	1,572,410	1,582,033	9,623	0.61%
17-feb	669,250	580,865	669,250	623,173	-46,077	6.88%
18-feb	596,880	931,719	596,880	556,299	-40,581	6.80%
20-feb	541,100	29,641	541,100	611,091	69,991	12.93%
21-feb	510,950	-1,299,881	1,810,831	1,881,076	70,245	3.88%
22-feb	682,500	905,100	682,500	663,400	-19,100	2.80%
23-feb	144,290	659,424	144,290	121,068	-23,222	16.09%
24-feb	814,930	-91,442	906,372	953,351	46,978	5.18%
25-feb	503,040	1,225,294	503,040	478,209	-24,831	4.94%
27-feb	984,490	1,234,214	984,490	972,253	-12,237	1.24%
28-feb	1,323,770	-145,838	1,469,608	1,500,790	31,182	2.12%
29-feb	-	262,103	-	-	-	
01-mar	1,767,770	-8,201	1,775,971	1,842,387	66,416	3.74%
02-mar	435,470	51,915	435,470	490,375	54,905	12.61%
03-mar	1,270,770	394,625	1,270,770	1,349,784	79,014	6.22%
05-mar	1,109,320	482,793	1,109,320	1,211,591	102,271	9.22%
06-mar	686,330	887,526	686,330	663,210	-23,120	3.37%
07-mar	257,800	-114,245	372,045	389,916	17,871	4.80%
08-mar	179,220	404,397	179,220	164,641	-14,579	8.13%
09-mar	1,010,030	538,957	1,010,030	969,751	-40,279	3.99%
10-mar	776,190	997,899	776,190	737,113	-39,077	5.03%
12-mar	238,310	111,267	238,310	278,102	39,792	16.70%
13-mar	861,940	-710,768	1,572,708	1,612,850	40,142	2.55%
14-mar	514,560	465,622	514,560	496,384	-18,176	3.53%
15-mar	1,101,190	-128,845	1,230,035	1,381,998	151,963	12.35%
16-mar	208,200	-751,982	960,182	1,027,903	67,721	7.05%
17-mar	1,227,020	462,729	1,227,020	1,307,776	80,756	6.58%
19-mar	784,870	1,263,122	784,870	783,635	-1,235	0.16%
20-mar	812,730	1,148,040	812,730	806,060	-6,670	0.82%
21-mar	733,700	424,648	733,700	724,228	-9,472	1.29%
22-mar	-	-211,951	211,951	209,503	-2,448	1.15%
23-mar	608,750	-411,022	1,019,772	1,012,848	-6,924	0.68%
24-mar	940,640	-640,683	1,581,323	1,609,424	28,102	1.78%
26-mar	581,650	-839,738	1,421,388	1,465,892	44,504	3.13%
27-mar	838,560	438,302	838,560	831,610	-6,950	0.83%

28-mar	300,770	-771,305	1,072,075	1,086,897	14,822	1.38%
29-mar	1,318,530	1,530,203	1,318,530	1,411,582	93,052	7.06%
30-mar	1,017,680	-320,377	1,338,057	1,334,965	-3,092	0.23%
31-mar	1,482,760	-101,004	1,583,764	1,698,953	115,189	7.27%

ANEXO 3

Detalle de predicción y residuales para una oficina captadora

Fuente: *Elaboración propia*

Fecha	Consumo Cajeros	Flujo Clientes	Demanda Real	Predicción	Residual	Porcentaje
02-ene	185,760	3,044,235	185,760	140,132	-45,628	24.56%
03-ene	402,060	1,120,862	402,060	375,930	-26,130	6.50%
04-ene	-	694,394	-	-	-	
05-ene	285,580	158,840	285,580	301,125	15,545	5.44%
06-ene	296,690	1,260,584	296,690	291,730	-4,960	1.67%
07-ene	199,120	276,177	199,120	210,571	11,451	5.75%
09-ene	254,950	2,943,562	254,950	244,099	-10,851	4.26%
10-ene	170,070	1,512,891	170,070	147,511	-22,559	13.26%
11-ene	-	1,286,833	-	-	-	
12-ene	287,840	692,318	287,840	297,732	9,892	3.44%
13-ene	239,990	496,063	239,990	254,912	14,922	6.22%
14-ene	-	562,761	-	-	-	
16-ene	572,700	1,098,933	572,700	461,827	-110,873	19.36%
17-ene	-	808,959	-	-	-	
18-ene	221,420	913,560	221,420	240,571	19,151	8.65%
19-ene	-	924,018	-	-	-	
20-ene	378,280	1,253,471	378,280	355,358	-22,922	6.06%
21-ene	233,190	275,777	233,190	243,686	10,496	4.50%
23-ene	-	1,067,072	-	2,376	2,376	
24-ene	483,610	1,070,605	483,610	424,572	-59,038	12.21%
25-ene	-	1,080,529	-	-	-	
26-ene	-	849,571	-	-	-	
27-ene	221,860	1,213,866	221,860	232,079	10,219	4.61%
28-ene	328,240	452,933	328,240	321,001	-7,239	2.21%
30-ene	197,960	1,308,333	197,960	218,785	20,825	10.52%
31-ene	211,250	1,244,719	211,250	218,881	7,631	3.61%
01-feb	253,370	767,793	253,370	243,199	-10,171	4.01%

02-feb	284,760	957,790	284,760	265,721	-19,039	6.69%
03-feb	249,200	755,751	249,200	233,880	-15,320	6.15%
04-feb	-	460,477	-	-	-	
06-feb	665,340	877,344	665,340	494,816	-170,524	
07-feb	-	1,886,167	-	-	-	
08-feb	-	902,017	-	-	-	
09-feb	270,210	791,334	270,210	257,234	-12,976	4.80%
10-feb	401,320	843,874	401,320	384,137	-17,183	4.28%
11-feb	-	475,595	-	-	-	
13-feb	274,590	873,974	274,590	301,593	27,003	9.83%
14-feb	-	1,197,253	-	-	-	
15-feb	400,550	1,019,520	400,550	387,145	-13,405	3.35%
16-feb	185,880	913,448	185,880	184,747	-1,133	0.61%
17-feb	-	1,140,600	-	-	-	
18-feb	698,590	222,806	698,590	500,397	-198,193	
20-feb	104,590	1,234,357	104,590	118,491	13,901	13.29%
21-feb	-	1,094,475	-	-	-	
22-feb	-	1,225,560	-	-	-	
23-feb	578,060	1,986,006	578,060	464,718	-113,342	
24-feb	-	1,416,874	-	-	-	
25-feb	295,170	183,426	295,170	311,547	16,377	5.55%
27-feb	346,300	2,141,950	346,300	343,777	-2,523	0.73%
28-feb	233,960	1,478,589	233,960	227,668	-6,292	2.69%
29-feb	-	1,434,700	-	-	-	
01-mar	566,160	2,135,576	566,160	488,932	-77,228	13.64%
02-mar	-	1,121,644	-	-	-	
03-mar	622,780	287,869	622,780	482,643	-140,137	22.50%
05-mar	205,940	2,330,275	205,940	230,548	24,608	11.95%
06-mar	421,560	1,126,513	421,560	403,166	-18,394	4.36%
07-mar	178,850	2,874,547	178,850	158,553	-20,297	11.35%
08-mar	-	1,129,247	-	-	-	
09-mar	544,700	1,831,431	544,700	452,648	-92,052	16.90%
10-mar	-	721,791	-	-	-	
12-mar	260,440	1,349,614	260,440	291,082	30,642	11.77%
13-mar	414,320	2,300,483	414,320	389,846	-24,474	5.91%
14-mar	-	1,622,070	-	-	-	
15-mar	218,680	1,221,680	218,680	216,827	-1,853	0.85%
16-mar	-	535,690	-	-	-	
17-mar	240,720	224,788	240,720	272,276	31,556	13.11%
19-mar	238,680	2,036,940	238,680	265,702	27,022	11.32%

20-mar	412,440	1,296,828	412,440	398,252	-14,188	3.44%
21-mar	171,360	968,244	171,360	199,011	27,651	16.14%
22-mar	-	534,976	-	28,516	28,516	
23-mar	253,480	1,274,312	253,480	280,163	26,683	10.53%
24-mar	257,920	470,314	257,920	284,805	26,885	10.42%
26-mar	-	1,193,130	-	-	-	
27-mar	513,770	909,924	513,770	452,651	-61,119	11.90%
28-mar	-	1,176,228	-	-	-	
29-mar	218,650	844,674	218,650	238,507	19,857	9.08%
30-mar	229,590	1,485,998	229,590	257,033	27,443	11.95%
31-mar	266,940	148,239	266,940	297,212	30,272	11.34%

