



1. 從  $m$  張有獎與  $n$  張無獎的彩券中，採抽出後不放回的抽法；請問 A、B 二人先抽與後抽，其中獎機率是否相同？必須證明，否則不予計分。(10%)

2. 某一公車載有 20 名乘客，自起站出發，沿途停靠 10 個車站。如果到達某一車站沒有乘客下車，就不停車。設以  $X$  表示停車的次數，且每一乘客在各車站下車的機率相等，且獨立，請計算  $X$  的期望值。(10%)

3. 設隨機變數  $X$  的機率分配如下：(10%)

$$f(x) = \frac{e^{-3} \cdot 3^x}{x!} \quad x = 0, 1, 2, \dots$$

請計算  $X$  的眾數(mode)。

4. 設  $X$  與  $Y$  的聯合機率密度函數如下：(10%)

$$f(x,y) = \begin{cases} 2 & \text{若 } x > 0, y > 0, x+y < 1 \\ 0 & \text{其他情形} \end{cases}$$

請計算  $X$  與  $Y$  的 Covariance：即  $\text{Cov}(X, Y)$ 。

5. 投擲一均勻骰子多次，每次皆為獨立，請計算：(10%)

(a) 在第 5 次時，第二次出現 1 點的機率。

(b) 在投擲 5 次皆未出現點數 1 的條件下，至少須投擲 9 次才會出現 1 點的機率。

6. (10%) 令  $\sigma^2$  為一常態母全體之變異數， $S^2$  為  $\sigma^2$  之不偏估計式。試求常數  $c$  使得誤差平方和之期望值  $E[(cS^2 - \sigma^2)^2]$  為最小。

7. (10%) 設隨機變數  $X$  之密度函數為  $f(x) = \theta x^{\theta-1}$ ,  $0 < x < 1$ 。令  $X_1, X_2, \dots, X_n$  為自此母體所抽出的一組隨機樣本。

(a) 以最大概度法(method of maximum likelihood)求  $\theta$  之估計式。

(b) 以動差法(method of moments)求  $\theta$  之估計式。



8. (10%) 大華想要知道在他手上的一枚硬幣是否公正。
- (a) 他投擲此硬幣 10 次，其中 3 次出現「Head」。問：是否有證據顯示此硬幣是不公正的？
- (b) 他投擲此硬幣 100 次，其中 30 次出現「Head」。問：是否有證據顯示此硬幣是不公正的？
9. (10%) 喜年來公司調查蛋捲在 Seven-11、惠陽和頂好等 3 種超市的銷售量，以隨機方式在台中市、斗六市和水林鄉各抽取一家，得上個月的銷售量如下表。試做 ANOVA 以檢定不同的超市是否影響蛋捲銷售量。 $(\alpha = 0.05)$

	台中市	斗六市	水林鄉
Seven-11	51	50	45
惠陽	68	52	49
頂好	57	47	46

10. (10%) 近年來由於台灣有線電視的合法化，加入經營的公司不斷增加，彼此間競爭愈來愈激烈。為了吸引更多的收視戶，一有線電視公司計劃由日本購入一些節目，用以新增一個頻道，但在播出此新頻道之前，搜集了 200 位成人的收視偏好，以作為未來之決策依據，其節果如下表。根據此表，試檢定性別和收視偏好間是否互相獨立。 $(\alpha = 0.05)$

	運動	連續劇
男	65	35
女	25	75





國立雲林科技大學

八十九學年度研究所博士班入學考試試題

所別：管理研究所

科目：統計學

Table A.6 (continued) Critical Values of the F-Distribution

$f_{\alpha}(v_1, v_2)$

$v_1$	$v_2$									
	1	2	3	4	5	6	7	8	9	$\infty$
1	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
2	19.40	19.41	19.43	19.45	19.45	19.45	19.47	19.48	19.49	19.50
3	8.79	8.74	8.70	8.66	8.64	8.64	8.59	8.57	8.55	8.53
4	5.96	5.91	5.86	5.80	5.77	5.77	5.72	5.69	5.66	5.63
5	4.74	4.68	4.62	4.56	4.53	4.53	4.46	4.43	4.40	4.36
6	4.06	4.00	3.94	3.87	3.84	3.84	3.77	3.74	3.70	3.67
7	3.64	3.57	3.51	3.44	3.41	3.41	3.34	3.30	3.27	3.23
8	3.35	3.28	3.22	3.15	3.12	3.12	3.04	3.01	2.97	2.93
9	3.14	3.07	3.01	2.94	2.90	2.90	2.83	2.79	2.75	2.71
10	2.98	2.91	2.85	2.77	2.74	2.74	2.66	2.62	2.58	2.54
11	2.85	2.79	2.72	2.65	2.61	2.61	2.53	2.49	2.45	2.40
12	2.75	2.69	2.62	2.54	2.51	2.51	2.43	2.38	2.34	2.30
13	2.67	2.60	2.53	2.46	2.42	2.42	2.34	2.30	2.25	2.21
14	2.60	2.53	2.46	2.39	2.35	2.35	2.27	2.22	2.18	2.13
15	2.54	2.48	2.40	2.33	2.29	2.29	2.20	2.16	2.11	2.07
16	2.49	2.42	2.35	2.28	2.24	2.24	2.15	2.11	2.06	2.01
17	2.45	2.38	2.31	2.23	2.19	2.19	2.10	2.05	2.01	1.96
18	2.41	2.34	2.27	2.19	2.15	2.15	2.06	2.02	1.97	1.92
19	2.38	2.31	2.23	2.16	2.11	2.11	2.03	1.98	1.93	1.88
20	2.35	2.28	2.20	2.12	2.08	2.08	1.99	1.95	1.90	1.84
21	2.32	2.25	2.18	2.10	2.05	2.05	1.96	1.92	1.87	1.81
22	2.30	2.23	2.15	2.07	2.03	2.03	1.94	1.89	1.84	1.78
23	2.27	2.20	2.13	2.05	2.01	2.01	1.91	1.86	1.81	1.76
24	2.25	2.18	2.11	2.03	1.98	1.98	1.89	1.84	1.79	1.73
25	2.24	2.16	2.09	2.01	1.96	1.96	1.87	1.82	1.77	1.71
26	2.22	2.15	2.07	1.99	1.95	1.95	1.85	1.80	1.75	1.69
27	2.20	2.13	2.06	1.97	1.93	1.93	1.84	1.79	1.73	1.67
28	2.19	2.12	2.04	1.96	1.91	1.91	1.82	1.77	1.71	1.65
29	2.18	2.10	2.03	1.94	1.90	1.90	1.81	1.75	1.70	1.64
30	2.16	2.09	2.01	1.93	1.88	1.88	1.79	1.74	1.68	1.62
40	2.08	2.00	1.92	1.84	1.79	1.79	1.69	1.64	1.58	1.51
60	1.99	1.91	1.83	1.75	1.70	1.70	1.59	1.53	1.47	1.39
120	1.91	1.83	1.75	1.66	1.61	1.61	1.50	1.43	1.35	1.25
$\infty$	1.83	1.75	1.67	1.57	1.52	1.52	1.39	1.31	1.22	1.00



Table A.6\* Critical Values of the F-Distribution

$f_{\alpha}(v_1, v_2)$

$v_2$	$v_1$									
	1	2	3	4	5	6	7	8	9	$\infty$
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5	240.5
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.38
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.96
$\infty$	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.88

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Table A.5 (continued) Critical Values of the Chi-Squared Distribution

$\nu$	0.30	0.25	0.20	0.10	0.05	0.025	0.01	0.005	0.001
1	1.074	1.323	1.642	2.706	3.841	5.024	6.635	7.879	10.827
2	2.408	2.773	3.219	4.605	5.991	7.378	9.210	10.597	13.815
3	3.665	4.108	4.642	6.251	7.815	9.348	11.345	12.838	16.268
4	4.878	5.385	5.989	7.779	9.488	11.143	13.277	14.860	18.465
5	6.064	6.626	7.289	9.236	11.070	12.832	15.086	16.750	20.517
6	7.231	7.841	8.558	10.645	12.592	14.449	16.812	18.548	22.457
7	8.385	9.037	9.803	12.017	14.067	16.013	18.475	20.278	24.322
8	9.524	10.219	11.030	13.362	15.507	17.535	20.090	21.955	26.125
9	10.656	11.388	12.242	14.684	16.919	19.023	21.666	23.589	27.877
10	11.781	12.549	13.442	15.987	18.307	20.483	23.209	25.188	29.588
11	12.899	13.701	14.631	17.275	19.675	21.920	24.725	26.757	31.264
12	14.011	14.845	15.812	18.549	21.026	23.337	26.217	28.300	32.909
13	15.119	15.984	16.985	19.812	22.362	24.726	27.688	29.819	34.528
14	16.222	17.117	18.151	21.064	23.685	26.119	29.141	31.319	36.123
15	17.322	18.245	19.311	22.307	24.996	27.488	30.578	32.801	37.697
16	18.418	19.369	20.465	23.542	26.296	28.845	32.000	34.267	39.252
17	19.511	20.489	21.615	24.769	27.587	30.191	33.409	35.718	40.790
18	20.601	21.605	22.760	25.989	28.869	31.526	34.805	37.156	42.312
19	21.689	22.718	23.900	27.204	30.144	32.852	36.191	38.582	43.820
20	22.775	23.828	25.038	28.412	31.410	34.170	37.566	39.997	45.315
21	23.858	24.935	26.171	29.615	32.671	35.479	38.932	41.401	46.797
22	24.939	26.039	27.301	30.813	33.924	36.781	40.289	42.796	48.268
23	26.018	27.141	28.429	32.007	35.172	38.076	41.638	44.181	49.728
24	27.086	28.241	29.553	33.196	36.415	39.364	42.980	45.558	51.179
25	28.172	29.339	30.675	34.382	37.652	40.646	44.314	46.928	52.620
26	29.246	30.434	31.795	35.563	38.885	41.923	45.643	48.290	54.052
27	30.319	31.528	32.912	36.741	40.113	43.194	46.943	49.645	55.476
28	31.391	32.620	34.027	37.916	41.337	44.461	48.278	50.993	56.893
29	32.461	33.711	35.139	39.087	42.557	45.722	49.588	52.336	58.302
30	33.530	34.800	36.250	40.256	43.773	46.979	50.892	53.672	59.703



Table A.5 Critical Values of the Chi-Squared Distribution

$\nu$	0.995	0.99	0.98	0.975	0.95	0.90	0.80	0.75	0.70	0.50
1	0.00593	0.0157	0.02628	0.0482	0.00982	0.0158	0.0642	0.102	0.148	0.435
2	0.0100	0.0201	0.0404	0.0606	0.103	0.211	0.446	0.575	0.713	1.386
3	0.0717	0.115	0.185	0.216	0.352	0.584	1.005	1.213	1.424	2.366
4	0.207	0.297	0.429	0.484	0.711	1.064	1.649	1.923	2.195	3.357
5	0.412	0.554	0.752	0.831	1.145	1.610	2.343	2.675	3.000	4.351
6	0.676	0.872	1.134	1.237	1.635	2.204	3.070	3.455	3.828	5.348
7	0.989	1.239	1.564	1.690	2.167	2.833	3.822	4.255	4.671	6.346
8	1.344	1.646	2.032	2.180	2.733	3.490	4.594	5.071	5.577	7.344
9	1.735	2.088	2.532	2.700	3.325	4.168	5.380	5.899	6.393	8.343
10	2.156	2.538	3.059	3.247	3.940	4.865	6.179	6.737	7.267	9.342
11	2.603	3.033	3.609	3.816	4.575	5.578	6.989	7.584	8.148	10.341
12	3.074	3.571	4.178	4.404	5.226	6.304	7.807	8.438	9.034	11.340
13	3.565	4.107	4.765	5.009	5.892	7.042	8.634	9.299	9.926	12.340
14	4.075	4.660	5.368	5.629	6.571	7.790	9.467	10.165	10.821	13.339
15	4.601	5.229	5.983	6.262	7.261	8.547	10.307	11.066	11.721	14.339
16	5.142	5.812	6.614	6.908	7.962	9.312	11.152	11.912	12.624	15.338
17	5.697	6.408	7.255	7.564	8.672	10.085	12.002	12.792	13.531	16.338
18	6.265	7.015	7.906	8.231	9.390	10.865	12.857	13.675	14.440	17.338
19	6.844	7.633	8.567	8.907	10.117	11.651	13.716	14.562	15.352	18.338
20	7.434	8.260	9.237	9.591	10.851	12.443	14.578	15.462	16.266	19.337
21	8.034	8.897	9.915	10.283	11.591	13.240	15.445	16.344	17.182	20.337
22	8.643	9.542	10.600	10.982	12.338	14.041	16.314	17.240	18.101	21.337
23	9.260	10.196	11.293	11.688	13.091	14.848	17.187	18.137	19.021	22.337
24	9.886	10.856	11.992	12.401	13.848	15.659	18.062	19.037	19.943	23.337
25	10.520	11.524	12.697	13.120	14.611	16.473	18.940	19.939	20.867	24.337
26	11.160	12.198	13.409	13.844	15.379	17.292	19.820	20.843	21.792	25.336
27	11.808	12.879	14.125	14.573	16.151	18.114	20.703	21.749	22.719	26.336
28	12.461	13.565	14.847	15.308	16.928	18.928	21.588	22.657	23.647	27.336
29	13.121	14.256	15.574	16.047	17.708	19.768	22.475	23.567	24.577	28.336
30	13.787	14.953	16.306	16.791	18.493	20.599	23.364	24.478	25.508	29.336



The Following questions are based on the paper entitled "Going Global: Lessons from Late Movers" by Bartlett and Ghoshal (2000). Please read through this article and answer the following questions:

1. According to the article, the entry barrier of "first mover advantage" can be overcome by "late mover advantage". What is your comment on this argument? (25%)
2. The article has outlined several possible solutions to overcome the "Liability of Origin". For the Taiwanese High Tech Firms, can you suggest and modify those solutions? (25%)
3. In today's global market, you don't have to go abroad to experience international competition. Sooner or later the world comes to you. Therefore, the globalisation has becoming increasingly important for Peripheral Taiwanese Firms. However, globalisation can be costly and resisted by the incumbents. Can you suggest how to overcome the resistances and justify the reasons for globalisation? (20%)
4. For the Late Movers, can you devise proper strategies suitable for peripheral Taiwanese late movers? (30%)



國立雲林科技大學

八十九學年度研究所博士班入學考試試題

所別：管理研究所

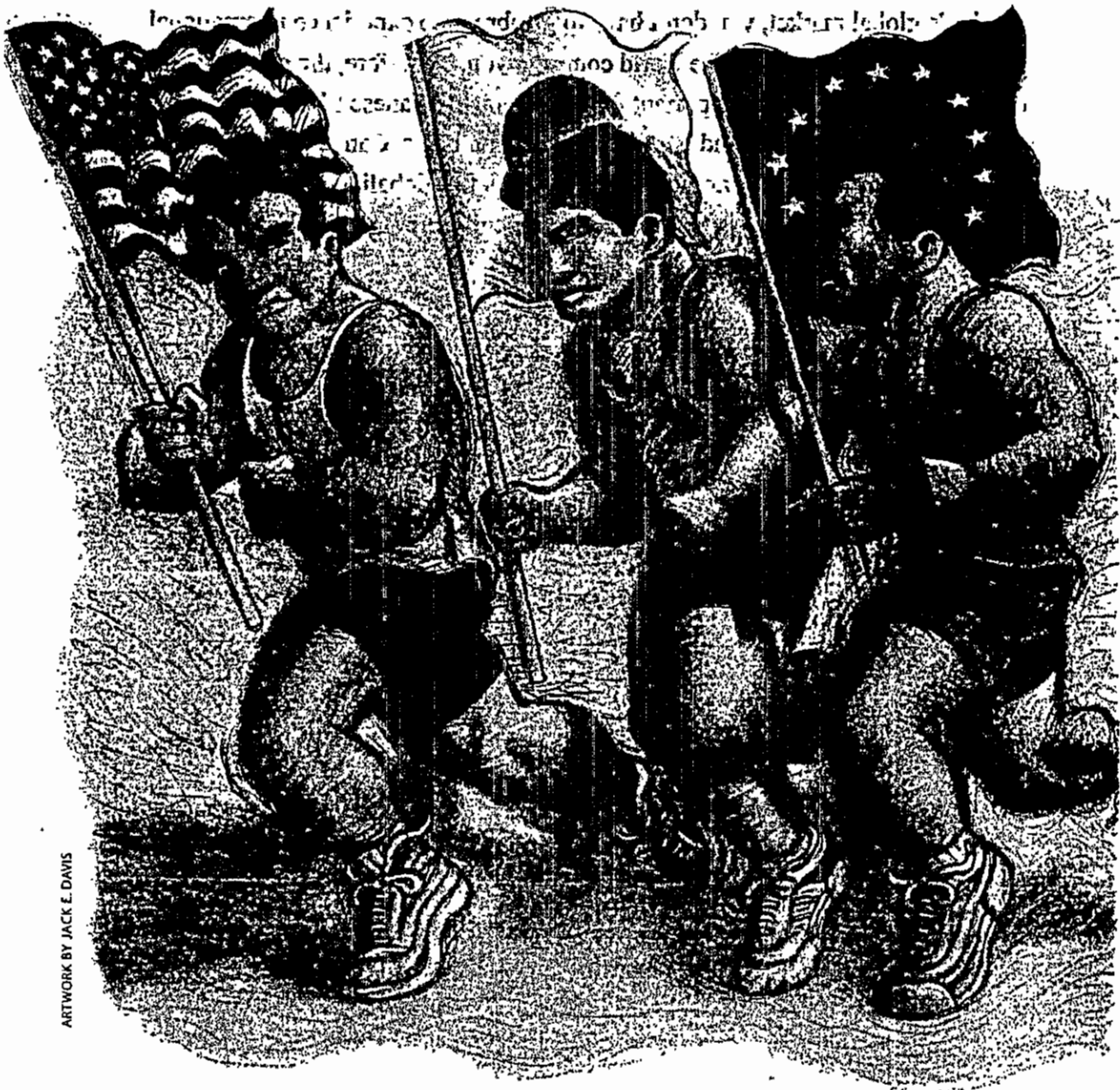
科目：管理文獻



# Going Global

## *Lessons from Late Movers*

Co  
ca  
str.



ARTWORK BY JACK E. DAVIS



*Contrary to popular wisdom, companies from the fringes of the world economy can become global players. What they need is organizational confidence, a clear strategy, a passion for learning, and the leadership to bring these factors together.*

By Christopher A. Bartlett  
and Sumantra Ghoshal

**I**N HIS AUTOBIOGRAPHY, former South African president Nelson Mandela recalls his dismay when he boarded an airplane and found that the pilot was African. With shock, he realized his reaction was exactly what he had been fighting against all his life. Mandela was discussing racism, but the same involuntary reactions surface in commerce. Consider labels such as "Made in Brazil" and "Made in Thailand." Someday they may be symbols of high quality and value, but today many consumers expect products from those countries to be inferior. Unfortunately, that perception is often shared by managers of the local companies that are striving to become global players.







That's just one reason why companies from peripheral countries find it so difficult to compete against established global giants from Europe, Japan, and the United States—the triad that dominates global commerce. And when they do compete, the experience of emerging multinationals often reinforces their self-doubt. Consider Arvind Mills, an Indian garment manufacturer that in the mid-1990s found a niche supplying denim to leading Western apparel companies. As Arvind's overseas sales grew, its stock soared on the Bombay Stock Exchange, and the company's CEO confidently declared that the company was well on its way to becoming a powerful global player. But within a couple of years, Arvind had become a victim of the fickle demands of the fashion business and the cutthroat competition among offshore apparel makers battling for the shrinking U.S. jeans market.

Stories such as Arvind's are told and retold in management circles. The moral is consistently negative. Companies from developing countries have entered the game too late. They don't have the resources. They can't hope to compete against giants. Yet despite the plausibility of such stories, we believe they are condescending and represent the counsel of despair. Indeed, there is plenty of evidence of an altogether different story. After all, companies like Sony, Toyota, and NEC transformed the cheap, low-quality image of Japanese products in little more than a decade. Is that type of turnaround still possible? To find out, we looked at companies that, unlike Arvind, have successfully built a lasting and profitable international business from home countries far from the heart of the global economy.

We studied 12 emerging multinationals in depth. They operate in a wide range of businesses, but they are all based in countries that have not produced many successful multinationals—from large emerging markets like Brazil to relatively more prosperous yet still peripheral nations such as Australia to small developing countries like the Philippines. And while these companies are distinguished by strategic, organizational, and management diversity, they share some common traits. Most notably, each used foreign ventures in order to build capabilities

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ities to compete in more-profitable segments of their industry.

The evolution into more-profitable product segments can be clearly tracked on what we call the value curve. All industries can be seen as a collection of product market segments; the value curve is a tool used to differentiate the various segments. [For an example, see the exhibit "The Pharmaceutical Industry's Value Curve."] The more profitable a segment, the more sophisticated are the capabilities needed to compete in it—in R&D, distribution, or marketing. The problem for most aspiring multinationals from peripheral countries is that they typically enter the global marketplace at the bottom of the value curve—and they stay there. This is true even when a company's internal capabilities exceed the demands of a particular segment. Arvind Mills, for example, expanded abroad with commodity-like products even though it competed successfully in higher-value segments at home. And it's not that companies don't see the profitability of value-added products; the performance of companies above them on the value curve is usually quite evident. Basically, their failure is due to a paralysis of will. Managers either lack confidence in their organization's ability to climb the value curve or they lack the courage to commit resources to mounting that challenge. Often, as Nelson Mandela's memoir illustrates, they are crippled by a vision of themselves as second-class citizens.

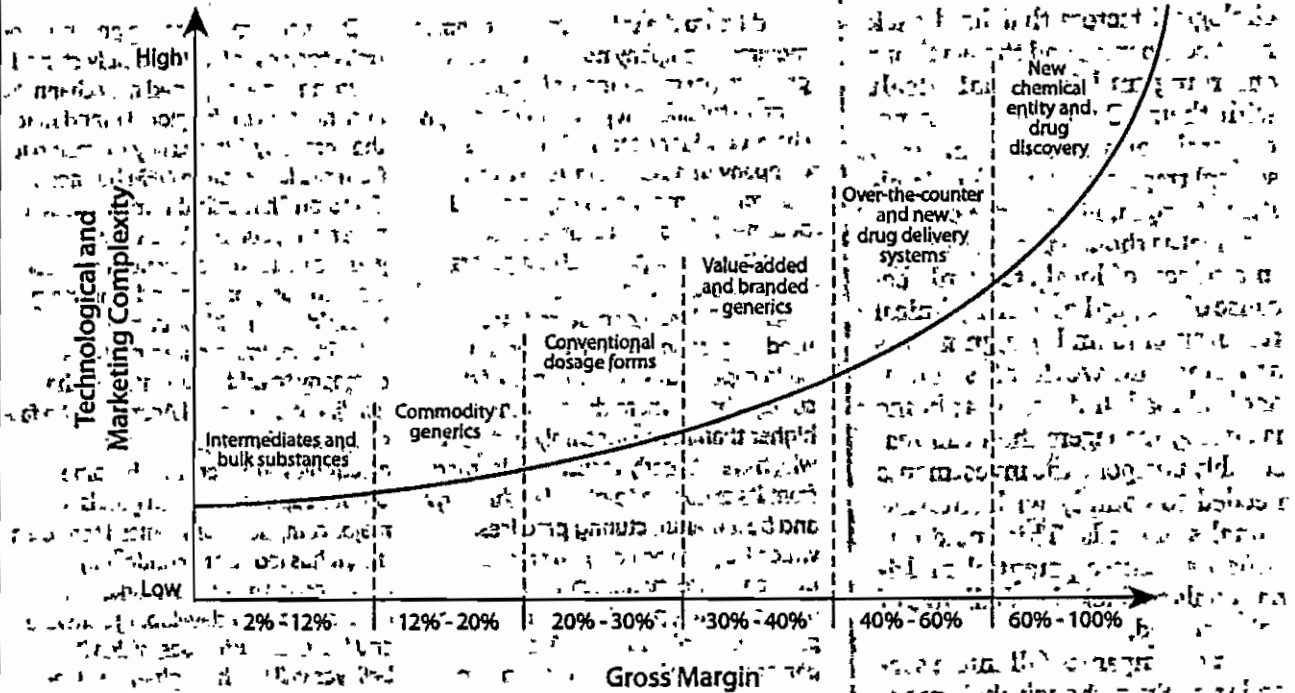
## A Model of Success

The Indian pharmaceutical company Ranbaxy is one of the success stories. For 18 years after it launched its export business in 1975, Ranbaxy was trapped at the bottom of the pharmaceutical value curve. Even though it had developed advanced product and process capabilities in its home market, when Ranbaxy decided to go overseas it opted to produce and sell bulk substances and intermediates in relatively unsophisticated markets. Because gross margins were between 5% and 10%, the additional revenue generated by the foreign business did not even offset the added costs of international sales and distribution. Management justified the negative returns by celebrating the prestige associated with being a multinational and making vague promises about using overseas contacts and experience to upgrade the business.

In 1993, Ranbaxy's approach to internationalization changed fundamentally. Parvinder Singh, the chairman and CEO from then until his death in 1999, challenged the top management team with his dream of transforming Ranbaxy into "an inter-



### The Pharmaceutical Industry's Value Curve



national, research-based pharmaceutical company." When his colleagues questioned how a small Indian company could compete with the rich giants from the West, he responded, "Ranbaxy cannot change India. What it can do is to create a pocket of excellence. Ranbaxy must be an island within India."

Once there was a shift in mind-set, the strategy was straightforward. The company moved into the higher-margin business of selling branded generics in large markets like Russia and China—a change that required building new customer relationships; a strong brand image, and different distribution channels. Ranbaxy then entered the U.S. and European markets, in which the company needed to meet much more stringent regulatory requirements. But by using its growing international knowledge and experience to develop new resources and capabilities, Ranbaxy established a profitable international business that accounted for more than half of its \$250 million in revenue in 1996.

Not content with that, Ranbaxy has already begun the long, slow climb to the upper regions of the pharmaceutical value curve. Thanks to consistently investing 4% to 6% of its revenue in R&D, the company has built a world-class laboratory staffed by 250 scientists. Pushed by Singh's persistent question—Why do we say that new drug discovery

is the exclusive preserve of the United States and Europe?—these scientists are committed to developing a \$500 million drug before 2003. They cannot spend \$300 million in R&D to develop the drug, the average expense in the West, but they believe they can cut that figure by a factor of four or five. "We have significant cost advantages in R&D, and we are prepared to invest \$100 million," says J.M. Khanna, Ranbaxy's head of R&D.

Ranbaxy's growth path is shared by the other companies in our study. They all faced and overcame the same core challenges as they attempted to go global. Their immediate challenge was to break out of the mind-set that they couldn't compete successfully on the global stage. Once freed of that burden, they had to find strategies in which being a late mover was a source of competitive advantage rather than a disadvantage. Finally, they had to develop a culture of continual cross-border learning. Winning companies enjoyed global success because they learned how to learn from the constant flow of new demands, opportunities, and challenges that international competition brings. This is, quite a leap for most emerging multinationals, the ability to see globalization as more than a path to new markets or resources is rare in all but the most sophisticated global companies.



## Going Global: Lessons from Late Movers

## Breaking Out of the Marginal Mind-Set

Let's take a closer look at the psychological factors that hold back most companies and the ways our emerging multinationals dealt with them. Companies from peripheral countries can fall into several traps, which we call liabilities of origin. First, some companies feel as though they are locked in a prison of local standards because of the gap between technical requirements and design norms at home and world-class standards abroad. If demand at home is strong, managers then can reasonably postpone the investments needed to comply with international standards. This insidious situation causes potential multinationals to duck the challenge of going abroad.

Some companies fall into a second trap. Even though their products and services are already up to snuff, because of the peripheral location, management is either unaware of the company's global potential or too debilitated by self-doubt to capitalize on it.

Finally, there are a few companies for which the liability of origin derives from a limited exposure to global competition, leaving them overconfident in their abilities or blind to potential dangers. Unfortunately, there are no quick solutions to any of these psychological barriers. But our emerging multinationals started to overcome them by creating a push from home and a pull from abroad.

**Push from home.** There are basically two ways for a company to create a push from home. In the first, a moment of truth stimulates the initial steps down the long path toward internationalization. This is particularly the case for companies that are so blinded by their domestic success that they fail to see that their origins present a liability. Therefore, management's greatest challenge is to shock or challenge

## Navigating the PC Industry's Value Curve

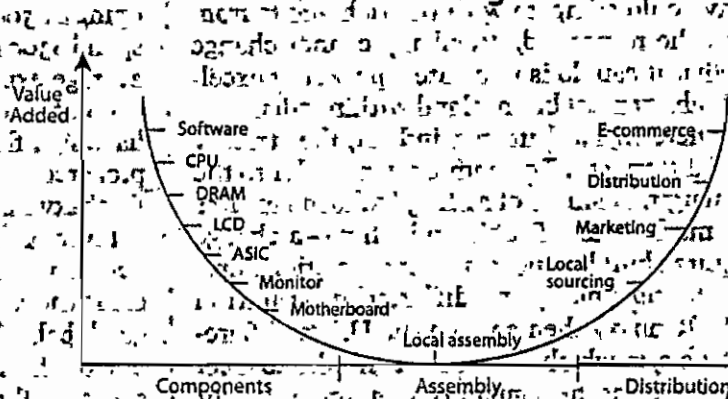
The drive up the value curve sometimes requires a company not just to shift product market segments but also to migrate to different points in the supply chain. Consider Acer, the Taiwanese company that started in 1976 as an electronic components importer and became the world's number three manufacturer of personal computers in just two decades.

As the PC market matured, Acer used its growing global presence to build capabilities at both ends of the supply chain, where the margins are higher than in the assembly business, which was its early focus. Acer learned from its exposure to global technology and best manufacturing practices, which helped the company move upstream into manufacturing motherboards, peripherals, and central processing units. In 1989, Acer partnered with Texas Instruments to produce semiconductors. Nine years later, it bought out TI's share.

Downstream, Acer's regional business units took over local assembly, started sourcing locally, opened new channels, and invested in the global brand that the company felt was key to freeing it from the low-margin OEM business. CEO Stan Shih calls this reorientation his "smiling curve." "Assembly means you are making money from manual labor. In components and marketing, you add value with your brains."

Shih's commitment to push his company to add value through the "smiling curve" saved Acer from the fate of dozens of other Taiwanese electronics suppliers that became captive suppliers of OEM goods to major computer companies. More than that, it has led Acer's continuing evolution in the global market. The company is now developing software and Internet businesses, which it believes will be the high-end value-added segments that will drive the next stage of Acer's global expansion.

## Stan Shih's Smiling Curve



Recognizing that Acer's focus on assembling PCs was keeping the company in the least profitable segment of the market, CEO Stan Shih decided to move up the value curve by developing capabilities in components and distribution. Succeeding in components required strong technology and enough manufacturing skill to produce economies of scale. Succeeding in distribution required a solid brand, established channels, and effective logistics. Acer has built both.

the company to push it from its nest. It was just such a moment of truth that enabled the Korean giant Samsung to turn around its international sales of consumer electronics. Less than a decade ago Samsung was struggling to expand into overseas



markets, even though its products were technologically equal to its competitors' offerings. The problem was that most of Samsung's managers were unaware of or denied the existence of negative consumer perceptions abroad, largely because Samsung's products were so well regarded at home.

To force the company to deal with the problem, chairman Kun-Hee Lee flew 100 senior managers to the United States to show them how Samsung's products were treated: The visit was traumatic. Prominently displayed in storefronts were Sony, Bang & Olufsen, and the products of other prestigious companies. Lined up behind them were brands such as Philips, Panasonic, Toshiba, and Hitachi. In the back of the stores, frequently with big "bargain sale" stickers on them, were the Samsung TVs and VCRs, often with a layer of dust dulling the high-quality finish that the company had invested trillions of won to achieve. As the distraught executives joined their chairman in dusting their products with their handkerchiefs, he spelled out what all of them could clearly see: they had a lot of work to do to change overseas consumers' expectations. That moment of truth had an enduring impact. The executives initiated a series of actions that eventually led to a major turnaround of Samsung's global consumer electronics business.

The second way to create a push from home requires a leap of faith more than a shock of recognition. These leaps can be dramatic, and they are always risky, like performing on a trapeze without a net. Some CEOs, for example, demonstrate their commitment to globalization by investing far ahead of demand; even if doing so reduces the company's responsiveness to its successful home market.

"Consider Thermax, a domestic Indian manufacturer of small boilers. Thermax had developed a radically different design for its boilers, which reduced their size by a third. Clearly, the new product could be a winner in the Indian market, where demand for such products was strong. But designing this new boiler to Indian specifications would make it virtually unsellable overseas. To succeed globally, the company not only had to meet the highest international technical standards but also had to develop a fundamentally different design concept. Overseas markets demanded sophisticated, and more expensive, integrated systems that enabled quick on-site installation, whereas India's lower labor costs allowed domestic contractors to take on more of the installation task themselves. Although the Indian market accounted for almost 80% of Thermax sales and 100% of profits, manag-

ing director Abhay Nalwade nonetheless decided to design the boiler for international markets. He believed the innovation gave the company one good shot at breaking into the European and North American markets. He was right. Today Thermax is the sixth-largest producer of small boilers in the world.

**Pull from abroad.** Pushes from home are indispensable, but if companies are to use international expansion to move up the value curve, they also need to invest in the management capabilities of their overseas units to provide pull from abroad. Simply sending home-office managers with a vague

Because of a company's peripheral location, its management may be unaware of its global potential.

charge to explore opportunities and open the market rarely achieves the objective; organizations need an engaged trading post, not just a passive listening post. Companies need offshore champions—often senior executives from the target market—who can provide the young, overseas organization with credibility and confidence, both internally and externally. Strong and credible voices from abroad can greatly increase the likelihood that emerging multinationals will have the courage to transfer organizational assets, resources, and influence outside their home country.

Natura, a direct-sales cosmetics company that has been named Brazil's most admired company for three consecutive years, learned that lesson the hard way. Although Natura has defended its strong market position in Brazil against international giants like Revlon, Estée Lauder, P&G, and Shiseido, it has failed to leverage its enormous product development and marketing strengths abroad—even in nearby markets like Argentina, Chile, and Peru. Absorbed by 40% to 50% growth at home, the company was unwilling to assign heavyweight managers to the new market opportunities. Abroad, it relied on unsupported midlevel expatriates and hastily hired outsiders who failed one by one. They didn't have the credibility needed to win top management's attention or the clout required to get the resources and the support vital to building a viable business abroad.

By contrast, Ranbaxy's Singh was committed to investing in overseas markets well ahead of demand. He realized that to do this he would have to create an organization in which managers from other parts of the world had a seat at the table on



key corporate decisions. He divided the world into four regions, of which India was just one, even though its sales and profits were four times larger than the other three combined. Equally strong managers were assigned to each region. For example, although the size of Ranbaxy's European operation could not justify it, Singh hired a senior British executive from a leading pharmaceutical multinational to head the region. This executive's clear and unwavering belief in Ranbaxy and his commitment to building its European business became a powerful pull from abroad, helping the Indian-based pharmaceutical company believe it could compete in developed Western markets.

### Devising Strategies for Late Movers

Once freed from the gravitational pull of its domestic market, the next major challenge for the emergent multinational is to choose a strategy to enter the global marketplace. On the face of it, the disadvantages of being a late entrant seem overwhelming. Management thinkers concluded long ago that the dominance of today's global giants is rooted in their first-mover status. Coca-Cola, for example, was the first soft-drink company to build a recognizably global brand. Moving first allowed Caterpillar to get a lock on overseas sales channels and service capabilities. Being a first mover enabled Matsushita to establish VHS as the global technical standard for videocassette recorders.

There are, however, some distinct advantages to turning up late for the global party. The emerging multinationals we observed typically exploited late-mover advantages in one of two ways. Some started by benchmarking the established global players and then maneuvered around them, often

*On the face of it, the disadvantages of being a late entrant seem overwhelming. But there are distinct advantages to turning up late to the global party.*

by exploiting niches that the larger companies had overlooked. Other companies adopted an alternative, though riskier, strategy. They used their newcomer status to challenge the rules of the game, capitalizing on the inflexibilities in the existing players' business models.

**Benchmark and sidestep.** Managers of small companies with limited international exposure fear that they will be ill equipped to face established global competitors in unfamiliar foreign environ-

ments. Yet in today's global market, you don't have to go abroad to experience international competition. Sooner or later the world comes to you. As a result, emerging multinationals can learn how to compete against the players in foreign markets simply by adapting and responding to those players as they enter the home market. That's exactly what the Philippines-based, fast-food chain Jollibee did. When the U.S. giant McDonald's began opening stores in Manila in 1981, few people believed Jollibee's tiny 11-store chain would survive. But CEO Tony Tan Caktiong and his management team decided to use the entry of McDonald's as a training ground to bring their young chain up to world class.

Going head-to-head against the experienced global company gave Jollibee's managers a firsthand view of the sophisticated operating systems that allowed McDonald's to control its quality, costs, and service at the store level. The lesson came at an ideal stage in the small chain's development, when the need for robust operating controls was the major constraint to further expansion. And what better model to learn from than a company whose refined systems control the day-to-day operations of thousands of stores worldwide? Indeed, it was on the strength of its improved operating systems that Jollibee established a network of 65 domestic stores by 1990—far outdistancing the expansion of McDonald's in the Philippines.

But Jollibee's management did not just copy McDonald's; it also looked for ways to innovate. As it gained a better understanding of McDonald's business model, Jollibee started to recognize the gaps in its strategy. The U.S. company's standard product line and its U.S.-dominated decision processes did not easily incorporate local taste preferences. Jollibee offered a more tailored menu—a slightly sweeter hamburger, an innovative chicken product, a kid-oriented spaghetti plate—to differentiate itself from the U.S. giant. The combination of Jollibee's new, efficient stores and consumer-sensitive menu earned the loyalty of existing customers and allowed Jollibee to expand the fast-food market to new consumers.

The insights born of having survived McDonald's arrival in the Philippines taught Jollibee how it could move abroad. Knowing that it needed to provide for local tastes, the company developed the jollimeal, a rice-based dish that could be adapted to the dominant local cuisine of the nearby markets that Jollibee began to enter in 1986. Jollibee respected McDonald's enough that it did not want to take on the global giant head-to-head in its first overseas forays. Instead, it started with the smaller markets where fast food was not yet well estab-

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lished, such as Brunei, Guam, and Vietnam. These early ventures helped Jollibee refine its strategy and learn about the problems of managing offshore franchises.

As Jollibee grew, it recognized that there was plenty of space for its differentiated products and that it had the capabilities to survive in larger and more competitive markets such as Indonesia and Hong Kong. Its niche products such as the *nasi lema*, a rice and coconut milk dish sold in Indonesia, and the chicken-mushroom rice offered in Hong Kong moved Jollibee beyond the increasingly commoditized product segments of hamburgers and fried chicken. By the early 1990s, Jollibee had established 24 overseas stores in ten countries, mostly in Southeast Asia and the Middle East. Though hardly on the scale of McDonald's network of more than 3,000 overseas outlets in almost 100 countries, Jollibee's operations nonetheless formed a sound basis for building a global franchise. In 1998, the company felt ready to take on the most demanding fast-food market in the world. Today, its first San Francisco store is performing at almost 50% above forecast levels, and two new stores have just opened. And Jollibee plans to roll out new stores in 17 other locations in California over the next 18 months.

**Confront and challenge.** Jollibee's success illustrates how a late entrant can benchmark and adapt the business models of its competitors. A more radical strategy is to introduce new business models that challenge the industry's established rules of competition. Though risky, this approach can be very effective in industries deeply embedded with tradition or comfortably divided among an established oligopoly. The typical business model in these industries has become inflexible. Among the companies we studied, the one that took advantage of others' inflexibilities the best was BRL Hardy, an Australian wine company that defied many of the well-entrenched traditions of international wine production, trading, and distribution—despite the fact that its home country produces only 2% of the world's wine.

From a 1991 base of \$31 million in export sales—much of it bulk for private labels and the rest a potpourri of bottled products sold through distributors—Hardy built its foreign sales to \$178 million in 1998, almost all of it directly marketed as branded products. Managing director Steve Millar describes the insight that triggered this turnaround: "We be-

gan to realize that for a lot of historical reasons, the wine business—unlike the soft-drinks or packaged-foods industries—had very few true multinational companies and therefore very few true global brands. There was a great opportunity, and we were as well placed as anyone to grab it."

In today's global markets, you don't have to go abroad to experience international competition. Sooner or later the world comes to you.

Millar was alluding to the inflexibility of the European practice of labeling wines by region, subregion, and even village—the French *appellation* or the Italian *dominazione* systems are classic examples. A vineyard could be further categorized according to its historical quality classification such as the French premier grand cru, the grand cru, and so on. The resulting complexity not

only confuses consumers but also fragments producers, whose small scale prevents them from building brand strength or distribution capability. This created an opportunity for major retailers, such as Sainsbury's in the United Kingdom, to overcome consumers' confusion—and capture more value themselves—by buying in bulk and selling under the store's own label.

For decades, BRL Hardy's international business was caught in this trap. It distributed its Hardy label wines to retailers through local agents and sold bulk wine directly for private labels. But Millar's insight gave the company a way out, if it was willing to change the rules of the game on both the demand and supply sides. First, new staff was appointed and new resources allocated to upgrade overseas sales offices. Instead of simply supporting the sales activities of distributing agents, they took direct control of the full sales, distribution, and marketing. Their primary objective was to establish Hardy as a viable global brand. The company's supply-side decision was even more significant. In order to exploit the growing marketing expertise of these overseas units, Hardy encouraged them to supplement their Australian product line by sourcing wine from around the world. Not only did Hardy offset the vintage uncertainties and currency risks of sourcing from a single country, it also gained clout in its dealings with retailers. By breaking the tradition of selling only its own wine, Hardy was able to build the scale necessary for creating strong brands and negotiating with retail stores.

The advantages have been clear and powerful. The company's range of wines—from Australia as well as France, Italy, and Chile—responds to supermarkets' needs to deal with a few broad line suppliers. At the same time, the scale of operation has



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supported the brand development so vital to pulling products out of the commodity range. Results have been outstanding. In Europe, the volume of Hardy's brands has increased 12-fold in seven years, making it the leading Australian wine brand in the huge UK market, and number two overall to Gallo in the United Kingdom. And branded products from other

seas managers from the highly successful Philippines fast-food organization. Then he systematically differentiated his operating systems, store design, menus, advertising themes; and even the company's logo and slogan. Despite his enthusiasm and energy, Jollibee's international sales struggled and losses mounted. Eventually that manager was

*The global marketplace is information based. Knowing how to learn is the central skill that allows a company to move up the value curve.*

countries have grown to represent about a quarter of its European volume. Hardy has evolved from an Australian wine exporter to a truly global wine company.

The company's new strategy and capabilities are visible in its recent introduction of a branded wine from Sicily called D'istinto. Under a supply agreement and marketing program initiated by BRL Hardy Europe, in its first year this product has sold 200,000 cases in the United Kingdom alone—an exceptional performance. As the brand is introduced to the rest of Europe, North America, and Australia, Hardy expects sales to top a million cases by 2003.

### Learning How to Learn

Ask most managers why they are steering their companies into international expansion and they will talk about increasing sales or securing low-cost labor and raw materials. Important as those objectives are, they do not ensure a company's success abroad. The global marketplace is information based and knowledge intensive. To survive in this environment, you must know how to learn; it is the central skill that allows a company to move up the value curve. Yet all learning requires tuition, and every company faces the risk that the effort involved in acquiring new capabilities may draw off too many vital resources and threaten the domestic business. The trick is to protect the past while building the future.

**Protect the past.** The first rule of companies that want to learn is to fully exploit the resources and capabilities that have provided competitive advantage to date. This is a simple notion, yet in the quest for global position, too many companies become so focused on where they are going that they forget where they are coming from. In the early stages of Jollibee's expansion, for example, an aggressive international division manager fell into the trap of trying to reinvent the company's business. By constantly emphasizing the differences of overseas markets, he deliberately isolated his over-

replaced with someone more willing to build on existing expertise.

The new manager took a few simple steps that were crucial to the company's subsequent international growth: First, he broke down the barriers between the international and domestic organizations and began building relationships that acknowledged his respect for their success and dependence on the home country's expertise. For example, international managers now train in the Philippines operations, learning from that organization's experience and making useful support contacts as they do. They also have given up trying to manage all their own financial and operations reporting systems, relying instead on the efficient home market staff. And when major overseas appointments come up—as one did to manage the key China and Hong Kong operations—the international group now feels comfortable drawing on the best and brightest from the Philippines—in this case the domestic VP of operations—rather than trying to staff from international ranks.

This sort of close cooperation between the parent company and its overseas subsidiaries establishes a dynamic of mutual learning. In Jollibee's case, the domestic organization's openness and exposure to international developments has allowed it to benefit from some of the adaptations and adjustments made to accommodate different situations abroad. For example, even though it is only a year old, the U.S. operations have already located chicken and beef suppliers for its restaurants in Southeast Asia, and the Philippines stores have just launched a cheesy bacon-mushroom sandwich originally developed for the U.S. market. So the operation that started by teaching its international managers has ended up learning from them. Such cross-pollination of ideas is key if emerging multinationals are to compete successfully with the giants they take on.

**Build the future.** Entering a new market successfully usually requires considerably more than simply tweaking the home-market formula. Often companies lack the expertise needed to tailor the



product or strategy to the new environment. So many emerging multinationals try to take a shortcut to learning by entering into a partnership with a foreign company. But while some of these international partnerships become successful long-term ventures, more fall apart due to an asymmetry of interests or a shift in the partners' power balance. When that happens, the emergent multinational as a new and small player is often left at a serious disadvantage.

Consider the situation faced by VIP Industries, India's largest luggage company and the world's second-largest producer after Samsonite of molded luggage. When it entered the UK market, VIP formed a marketing partnership with a local distributor that promised access to the country's largest retailers. A breakthrough came when the distributor, with VIP's help, won the franchise to establish a specialty luggage department in each of Debenhams' 75 stores nationwide. VIP invested heavily in staff training for the specialty departments, and it was rewarded with a 60% share of Debenhams' hard luggage sales. Yet when Samsonite offered VIP's distributor exclusive rights to its revolutionary Oyster II model, the local agent switched allegiances with hardly a thought. With no direct investment in its own local sales and marketing capabilities, VIP was powerless to respond.

In theory, companies can sidestep the disadvantages of partnering by buying the necessary capabilities. But that can create problems of its own. That was the mistake that Hardy made when it committed to international expansion. In the course of just two business trips to Europe, the company's management had snapped up two established London wine merchants, a large French winery and estate, and a historic Italian vineyard. Hardy believed the acquisitions would provide an asset base and knowledge pool to broaden its product sources and increase its marketing clout. But the challenge of simultaneously developing expertise in Italian and French wine making as well as English marketing proved overwhelming and soon placed huge financial and management strains on the company.

After that false start, Hardy realized that in international business new capabilities cannot simply be installed; they must be developed and internalized. That's why, despite acute financial pressures, the company rejected a tempting opportunity to rapidly expand its UK market volume by supplying wine for a leading grocery chain's private label. Instead, it opted for the more difficult task of building Hardy's own brand image and the marketing and distribution capabilities to support it. That has required considerable investment in new personnel

and training, as well as a major reorientation of internal culture.

In 1991, Christopher Carson, an experienced international wine marketer, was appointed managing director of the company's UK operations. Over the next 18 months, Carson pruned three-quarters of the items in the fragmented product line, replaced half his management team, and began building a culture around creativity and disciplined execution. Within three years, he had not only quadrupled sales of Hardy brands but also developed one of his imported wines from Chile into the biggest-selling Chilean brand in the United Kingdom. Hardy's revenues and profits have amply rewarded this investment, and the organization has developed a worldwide pool of knowledge and expertise that benefits the entire company. Carson, for example, has become the company's acknowledged expert in structuring sourcing partnerships and marketing outsourced wine brands. After building experience negotiating the Chilean partnership, he led the company's efforts on the Italian joint venture that sourced and marketed the successful D'istinto brand. Leveraging this expertise, he is now leading a new Spanish project.

## Having the Right Stuff

As we examined the activities of this handful of companies that overcame their liabilities of origin, exploited their late-mover advantages, and captured and leveraged learning in global markets, we were struck by one commonality. From fast food to pharmaceuticals, from Brazil to Thailand, moving from the periphery into the mainstream of global competition is such a big leap that it was always led from the top. In each and every case, the emerging multinationals had leaders who drove them relentlessly up the value curve. These leaders shared two characteristics. First, their commitment to global entrepreneurialism was rooted in an unshakable belief that their company would succeed internationally. Second, as their operations expanded, they all exhibited a remarkable openness to new ideas that would facilitate internationalism—even when those ideas challenged established practice and core capabilities.

With a PhD in pharmacology from the University of Michigan, Ranbaxy's Parvinder Singh was always a scientist-entrepreneur at heart. It was Singh who envisioned Ranbaxy as an international, research-based pharmaceutical company. Every time urgent domestic needs appeared to overwhelm R&D priorities, he protected the programs that would support foreign markets and those that searched for either





## Going Global: Lessons from Late Movers

new drugs or new drug-delivery systems. Whenever the well-established intermediates business appeared to monopolize international managers's time and energy, he reminded them that their ultimate purpose was to move up the value curve and that the intermediates business was a means, not the end. Beyond specific actions, Singh protected the faith. Just like the ancient priests in rural India who seldom intervene in the community but who nonetheless exert a constant influence over the lives and behaviors of the villagers, Singh was always there, standing up for internationalization. Respecting him meant respecting his dream, and that perhaps more than anything else pushed senior managers to persist with international initiatives, even when the costs appeared too high.

The second quality of global leadership—openness to new ideas—was most clearly and forcibly displayed by Dr. Peter Farrell, CEO of ResMed. ResMed is an Australia-based medical equipment company that specializes in the treatment of a breathing disorder known as obstructive sleep apnea (OSA). Spun off in 1989 by U.S. giant Baxter International, ResMed was a struggling start-up with a crude early product generating just \$1 million in annual revenue. By 1999, it was the world's number two competitor in the fast-growing market for OSA treatment devices, and its products were generating sales of some \$90 million a year.

Farrell's receptivity to new ideas was responsible for this dramatic change in fortune. Although the company's co-founder, Dr. Colin Sullivan, the inventor of ResMed's product, was acknowledged as one of the industry's most knowledgeable experts, Farrell pushed ResMed's researchers to build strong networks with other leaders in the international medical community. He led a team on a worldwide fact-finding tour of leading researchers and physicians; for example, and he put together a medical advisory board to help ResMed develop its products to be the industry standard. To help shape the medical debate, the company also organized annual global medical conferences on OSA, distributing the proceedings in

ResMed-sponsored CD-ROMs. More recently, Farrell launched a campaign to have the medical profession recognize the strong links between sleep-disordered breathing and the incidence of strokes and congestive heart failure. It is a bold initiative and requires substantial investment, but it has the potential to raise the medical profile of OSA dramatically, and in doing so, multiply ResMed's target market substantially. Farrell has also moved the company's center of operations in order to be closer to his largest and most sophisticated markets. In these and other ways, Farrell pushed the company to act like a leading global player long before that was an operating reality.

Strong leaders changed the fates of ResMed and Ranbaxy, Hardy and Jollibee, and the other companies discussed here. These leaders are models for the heads of thousands of marginal companies in peripheral economies that have the potential to become legitimate global players. Like Nelson Mandela, they can lead their followers out of the isolationism and parochialism that constrains them. They can do so by climbing up the value curve into the mainstream of the global economy. □

Reprint R00201

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