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PAPER 2

PETROLEUM INDUSTRY STRATEGIES

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FILE COPY

The objective of this paper is to review the key strategies that the petroleum industry has pursued and is currently undertaking - the primary focus will be on the exploration and production sector.

The strategies that all corporations pursue - including petroleum firms - do not exist in isolation. They depend on a small number of internal and external factors.

The key external drivers include:

- 1) the overall trend in energy and oil supply, demand and price
- 2) actions of governments with respect to fiscal burden
- 3) actions of OPEC to maintain production levels and oil prices.

The key internal drivers include:

- 1) the existing asset base: reserves and success in replacing reserves; upstream and downstream infrastructure; geographical and sectoral diversification;
- 2) financial profitability and capital structure
- 3) managerial capacity.

The corporation has little influence over the external factors and must develop strategies which will accommodate the anticipated business environment including the uncertainty that events may turn out to be different from the most likely outcome. The corporation has greater

control over the internal factors - indeed they are the major constraints within which strategies are developed. There have been significant changes in both external and internal factors over the past decade and a half - these have altered the economics of the petroleum industry and have caused major changes in the strategies followed by petroleum companies. The high level of uncertainty about future trends in key external drivers as well as the adverse change in the financial circumstances of the industry has forced the industry to seek mechanisms to reduce risk and to pursue less aggressive strategies.

To make any informed guess at what future strategies will be we need to look at what has happened. The past affects our views of the future and also determines our capacity to pursue future strategies. The dramatic changes of the past decade and a half have profoundly altered the economics of our industry, prompting major shifts in corporate strategies. Not all of them were successful. I would like to briefly look at how petroleum firms responded, first to rising prices, from 1973 to 1980, and then to falling prices, from 1981 to 1986.

World oil prices rose from less than \$3/barrel in 1973 to about \$34 by mid-1980. The cash flow of major oil companies rose sharply, but so did petroleum taxes in consuming countries. Most of the higher profits and return on capital came from the upstream sector. By and large, downstream profitability remained below the cost of capital.

Most companies directed much of their increased cash flow into exploration and development. It looked like prices would continue rising forever, and in that context almost any petroleum development looked attractive. A number of higher-cost resources were developed, in the North Sea, North American and elsewhere. Many exotic concepts were considered, and, while some good development work was done, expensive mistakes were also made. A second major thrust in the era of rising prices was diversification. Companies moved into coal, nuclear, renewable and exotic energy sources. They tried high tech ventures, minerals and even totally unrelated enterprises, as they looked for profitable ways to invest their surplus funds. These efforts often yielded poor returns, due to high purchase or start-up costs, unrealistic price projections, debt service costs, or simple inability to add value to the base business.

Prices turned downward in 1981, and declined steadily towards the sharp drop of 1986. Industry cash flow contracted sharply. The high exploration and development expenditures of the previous era now yielded inadequate returns. Companies came under pressure from financial markets to enhance shareholder value through lower capital spending, higher dividend payouts, common stock repurchases and higher debt ratios. Industry responded with large reductions in capital expenditures, particularly in the upstream. There were moves to acquire rather than explore for new reserves. In the downstream, overcapacity was the major

concern. As demand shrank, so did profitability, and utilization rates plummeted. The industry struggled to cut costs and reduce surplus refining capacity. Another key strategic response was the move away from vertical integration towards running individual business sectors as separate profit centres. This was accompanied by a shift away from diversification back to the core petroleum business. Efficiency, cost minimization, staff cutbacks, debt reduction, the elimination of excess capacity - these became industry watchwords.

The sharp price drop early in 1986 showed us, if we didn't know already, how fragile our forecasts and scenarios are, how unpredictable the economics of our industry have become. As we look forward it is now clear that the 1986 price drop introduced a fundamental new level of uncertainty about the world oil market over the next decade! Oil demand will show little growth and oil will account for a lower proportion of total energy demand in the future. On the supply side OECD oil production has peaked and will decline from now on. Non-OECD, non-OPEC oil supply has increased over the past decade and should continue to grow reflecting the low level of exploration in these areas historically and the increased exploration emphasis now being placed in these countries by the international oil industry: there is however considerable uncertainty as to the magnitude of increase in oil supply from non-OECD, non-OPEC countries. Perhaps the greatest uncertainty is OPEC which contains the largest reserves and production capacity but whose ability to function as an effective cartel is seriously limited.

OPEC can provide the incremental oil supply needed but at what price?

This uncertainty results from OPEC being the residual or swing element in the current oil market and the call on OPEC depends on how the other elements of the oil supply/demand puzzle work out.

There are so many uncertainties surrounding the future path of oil prices that the petroleum industry can no longer rely on a single "best-guess" scenario. Many companies evaluate possible strategies under two quite different scenarios: one showing slow increases in real oil prices beginning in the 1990's, and a second one which shows virtually no real growth in prices over the next two decades i.e. covering a band ranging from \$15 to \$25/barrel (constant dollars). While the most probable scenario is that oil prices will rise in the 1990's, it is essential to consider seriously the alternate scenario of prolonged weakness in world oil prices. The strategies to be pursued should be resilient no matter which of the oil price scenarios materializes. Faced with quite different business environment possibilities it is not surprising that the petroleum industry is having difficulty in formulating strategies for the 1990's. There are, however, some common elements which appear likely to form part of the strategies of most major petroleum corporations over the next decade.

1. Selective Exploration Spending

The huge increase in industry revenues and cash flow in the period up to 1981 prompted a corresponding increase in upstream capital expenditures. The subsequent decline in oil prices resulting in sharply lower reserves and cash flows prompted a corresponding decline in upstream expenditures. As we look forward in an era of uncertain oil prices it is highly likely that all categories of upstream spending will show little growth and will be subject to greater financial discipline than in the 1970's and early 1980's.

The most consistent data available to analyze international exploration and development spending and strategies is provided by U.S. domiciled firms plus Royal Dutch/Shell and British Petroleum. Petroleum firms listed on U.S. financial exchanges are subject to extensive disclosure which enables detailed examination of activities. No similar data is consistently available for European petroleum firms such as ENI, ELF-Aquitaine, Total-CFP, Petrofina or important oil producing firms such as Petroleos de Venezuela, Pemex, Statoil or Petrobras. The U.S. firms plus Shell and B.P. do provide a good indicator of trends in international exploration and development spending - they are by a considerable margin the most important players and we know a lot about what they do.

Upstream Capital Spending

(\$ Billions)

	<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>
Property Acquisition*	60.9	6.0	66.9
Exploration	69.8	40.6	110.4
Production	99.0	58.3	157.2
Total	229.7	104.9	334.5

* Purchase of petroleum leases, bonus bids paid to governments and private property holders - a very significant component in U.S. exploration.

Upstream capital spending amounted to \$334 billion over the 8 year period from 1979 to 1986 of which 68% was spent in the U.S. Of the remaining \$105 billion spent outside the U.S. I estimate \$55 billion was in OECD countries mainly Canada and the North Sea and \$50 billion was spent in a large number of non-OECD (and mostly non-OPEC) countries.

Analysis of capital spending shows a clear decline in all categories since 1982 with a very sharp drop in 1986 and 1987. Budgets in 1988 show a modest increase over the previous year but well below the levels of the early 1980's. Just as spending in the U.S. grew most quickly during the boom times - it also was cut most sharply. U.S. exploration spending declined from \$11½ billion/year in 1981 and 1982 to about \$4½ billion/year currently.

There are a number of reasons for this:

- . The heavy spending yielded poor results in terms of reserve additions and high finding costs.
- . Future prospects appear poor except in the offshore and frontier regions due to the maturity of most U.S. onshore basins
- . U.S. fiscal terms did not provide an offset to declining oil price to the same extent as foreign jurisdictions e.g. Canada, North Sea
- . U.S. governments have not adjusted petroleum taxes downwards - many foreign jurisdictions have done so.
- . Foreign jurisdictions have changed fiscal terms to provide foreign investors with greater certainty - this makes petroleum firms more willing to risk exploration and development capital in these countries.

Exploration spending in foreign jurisdictions also declined from the level of the early 1980's but much less sharply and a recent survey of spending plans of petroleum firms shows a tendency to increase foreign spending while holding U.S. exploration constant. The major reasons noted for this switch to foreign jurisdictions:

- . better geological prospects
- . improved fiscal terms
- . better profit margins and economics

Thus as we look forward over the next 5 years we are likely to see a lower level of exploration spending - \$10.7 billion/year versus \$14.2 billion/year and a continued shift outside the U.S.

Annual Exploration Expenditures

(\$ Billions)

<u>1979-1986</u>			<u>1986-92</u>		
<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>	<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>
8.6	5.6	14.2	4.7	6.0	10.7

The most important features of future exploration programs are likely to be:

- 1) Highly disciplined exploration programs to ensure that finding and development costs are low enough to yield satisfactory economics even in an environment of modest growth in oil prices
- 2) A shift within the U.S. toward higher potential areas in the offshore such as the Gulf of Mexico, offshore California, Alaska where larger potential reserves offset higher exploration and development costs. The majors will increasingly focus on the offshore with onshore activity being largely the provinces of the independents.

- 3) A shift in the balance of exploration budgets towards foreign countries - particularly in non-OPEC, non-OECD countries where geological prospects are better and where margins are now comparable or better than the U.S.

- 4) Continued emphasis on areas with an established infrastructure, where firms can have confidence in being able to develop reserves within budget; where the fiscal structure will allow marginal field development and also shield returns against a decline in oil prices. A good example is North Sea development which is again becoming active after a bad slump in 1986/87.

2. Incremental rather than Mega-Project Development

Over the 8 year period 1979-1986 worldwide development spending totalled \$157 billion of which \$99 billion (62%) was in the U.S. and the remaining \$58 billion was in foreign jurisdictions. I estimate that \$35-40 billion of spending in foreign countries was in Canada and the North Sea. We have seen a sharp drop in development spending since 1982, particularly in the U.S. where annual spending has dropped from \$12-15 billion to \$8 billion currently. Over the next 5 years we are likely to see a 20% decline in development spending and a much closer balance between U.S. and foreign development expenditures.

Annual Development Expenditures

(\$ billion)

<u>1979-1986</u>			<u>1987-1992</u>		
<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>	<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>
12.4	8.3	20.7	8.8	8.0	16.8

In an environment of uncertain oil prices - oil companies will be reluctant to proceed with major high-cost projects. There are many opportunities for firms to offset existing reserves decline with new higher cost developments. These developments are often in hostile or remote locations e.g. in the offshore or far-northern areas. Typically such projects involve heavy capital costs, have long lead times and sometimes high operating costs as well. All require high and rising real oil prices to achieve acceptable economic returns. There is a substantial risk element to this type of project and little opportunity to pull back once development is committed to. In circumstances of uncertain oil prices petroleum firms will tend to defer this type of project in favour of projects which can be expanded incrementally. In the latter projects you can get started with much less capital, get into production quicker and get cash flow to help finance later stages. Even more important, if the economics turn sour you can stop development and cut your losses.

In Canada we have seen the staged development of bitumen projects rather than the massive scale projects contemplated in the early 1980's. We also have a number of offshore oil development projects such as Hibernia (which contains recoverable reserves in excess of 500 million barrels) as well as extensive oil sands mining opportunities. These projects require an average oil price of \$23/barrel (constant U.S. \$'s) to achieve acceptable economics without any fiscal burden, have massive capital requirements and long lead times. Firms are very reluctant to go forward with this scale of project until they can have greater confidence in future oil prices.

On the petroleum development side the following strategies will be emphasized.

- (1) Deferral of mega-projects until there is a clear indication of tighter world oil markets and consistently higher oil prices.
- (2) Emphasis on incremental projects to lower capital requirements and to minimize risk.
- (3) Utilize existing infrastructure to enhance recovery of existing reserves and to bring on new fields which can tie into already built facilities.
- (4) Development of non-OECD, non-OPEC reserves which offer low replacement costs relative to more established production basins.

3. Reserve Acquisition

The major oil companies face a continuing need to replace reserves - as recent trends have clearly indicated that new reserve additions are insufficient to offset production. A strategy which a number of the major corporations have been pursuing is to purchase reserves rather than explore for new reserves. This has resulted in some major acquisitions such as Superior Oil by Mobil, Getty by Texaco and Gulf by Chevron. Another strategy has been to acquire the minority held shares of a subsidiary - such as the actions of Royal Dutch/Shell and of British Petroleum. In addition companies such as Exxon and Shell Oil have been actively purchasing reserves from corporations encountering financial difficulty. This trend is likely to continue as the major corporations have a strong financial base and healthy cash flow while many less financially strong petroleum corporations are trading well below break-up value. Thus the after-tax cost of purchasing reserves may well be lower than the alternative of exploring and developing new resources. Companies will be continuously watching the purchase vs explore/develop relative cost advantage and shifting funding accordingly.

4. Concentration on Core Business Sectors

The diversification efforts pursued by many petroleum firms in the early 1980's were a financial disaster and a clear pattern has emerged over the past 3 years to dispose of non-strategic assets and concentrate on core petroleum areas. This pattern is unlikely to change and the activities of petroleum firms will continue in the areas they know best, exploration and production of oil and natural gas; refining and marketing of petroleum products; petrochemicals and coal. Activities beyond these business sectors will be very selective and of relatively minor importance.

5. Cost Control

Reducing and controlling costs will continue to dominate all corporate strategies. Over the past 2 years we have seen evidence of this by all firms:

- reorganization and streamlining of management structure
- a large reductions in employee numbers
- reductions in inventories in order to reduce working capital costs and minimize vulnerability to oil price reductions
- continued pressure to reduce operating costs in all sectors
- elimination of non-strategic business and concentration on sectors or geographic markets where the firm is strong

All of these pressures to lower costs will continue and in addition a lower price environment is forcing the industry toward lower cost development options. Significant reductions in new field development have been achieved and as a result cost savings of 40% - 50% have been made compared to estimates developed in more prosperous times. Thus smaller fields can be brought into production which will yield acceptable economics at an oil price level of \$18/barrel compared to \$25/barrel 3 years ago. Looking at new North Sea development we can identify a number of key reasons for reduction in cost:

- greater standardization of platform design
- increased heavy lift capacity for platform installation
- remote production control technology

which have resulted in lower costs - both at the capital investment and at the operating stage. In Canada we have been able to significantly reduce the operating costs of projects such as the Suncor and Syncrude synthetic oil sands mining ventures. The decline in exploration and development activity has resulted in a very competitive oil service industry and lower drilling costs have been an important offset to lower oil and gas prices. Reducing exploration and development costs through research and technology will be stressed - examples include three dimensional seismic techniques, faster drilling, reservoir stimulation and increased spacing of offshore platforms.

6. Mechanisms to Minimize Risk

The traditional mechanisms for reducing risk will continue to be important: risk sharing with partners and diversification among projects, geographic regions and sectors. The trend evident over the past 5 years of rapidly expanding spot, futures and options markets for crude oil and petroleum products will continue to grow and develop. Oil has taken on the attributes of other commodities such as gold, copper, coffee etc. and active markets to trade oil have become a feature all petroleum corporations must recognize and become involved in. This may result in greater price volatility than in the past but it does provide mechanisms to reduce risk. The traditional joint venture aspect of exploration and development ventures enables firms to reduce the capital committed to a single venture and will continue to be an important feature of the industry. Petroleum firms are also tending to favour fiscal regimes for new projects where taxes vary with oil price trends: this can result in higher taxes if oil prices rise but the fiscal regime provides downside protection if oil prices fall.

7. Increasing Downstream Profitability

Petroleum firms are putting greater pressure on downstream operations to improve profitability and return on assets on a continuing basis. This has resulted in a cutback in refining capacity to achieve a better

balance with market demand. The shift by many majors to individual profit centres for various business sectors has meant a focus of the profitability of each individual sector rather than the integrated profitability of the overall corporation. The development of an active set of crude oil and product markets has meant that downstream operations must achieve low cost feedstock even if this means shopping around for crude oil rather than purchasing from upstream affiliates. At the same time as the majors have been moving away from integrated operations a number of oil producing countries have been integrating forward. Several different options have been pursued by various OPEC countries.

- . building export oriented refineries
- . entering into long-term processing deals under a netback arrangement
- . purchasing downstream operations

The prime motive has been to secure markets for crude oil during the current period of oversupply. Over the longer term some OPEC producers seek to exploit the historic tendency for upstream and downstream profitability to exhibit different peaks and thus to even out longer term cash flow. The downstream refiner - particularly independents are attracted to the greater certainty of margins and the enhanced security of supply provided by a link with an OPEC participant. The most widely noted examples of OPEC countries integrating forward have been Kuwait and Venezuela but it is evident that a wider number of countries including Nigeria, Saudi Arabia and others are seriously considering this strategy.

CONCLUSION

The world petroleum industry has long been familiar with the risks inherent in the business and the uncertainty that the future will provide satisfactory returns on capital invested. Petroleum corporations have developed strategies to cope with these realities. In the exploration and production sector we are likely to see a continuation of strategies already put in place since oil prices started to decline early in the 1980's.

- . lower exploration expenditures which are increasingly focused outside the United States - aimed at replacing reserves at a cost which will yield good economics even if oil prices grow slowly.
- . emphasis on lower cost, incremental development projects which utilize existing infrastructure.
- . utilization of a variety of mechanisms to reduce risk both in existing operations and in new developments.
- . use of technology to reduce exploration and development costs and to increase reservoir recovery.
- . greater integration of upstream and downstream operations - with the OPEC producers providing the greatest pressure for integration.
- . deferral of mega projects until corporations have greater confidence in the future oil prices.

APPENDIX

Figure 1	Petroleum Exploration Expenditures
Figure 2	Petroleum Development Expenditures
Figure 3	Property Acquisition Expenditures
Figure 4	Total Upstream Capital Expenditures
Figure 5	Rigs Active-By-Region
Figure 6	Changes in Non-OPEC Supply
Table 1	Rigs Active - by major country: 1982 and 1987
Table 2	Worldwide Exploration and Development Expenditures - by company

Table 1

Number of Rigs Active - By Major Country

	1982		1987	
	<u>Onshore</u>	<u>Offshore</u>	<u>Onshore</u>	<u>Offshore</u>
Argentina	62	2	65	1
Mexico	180	22	121	32
Brazil	63	31	33	18
Columbia	22	1	12	0
Venezuela	52	18	11	9
Other				
Total Western Hemisphere except Canada & U.S.A.	436	87	270	69
United Kingdom	2	55	5	42
Norway	0	13	0	12
Total Western Europe	148	99	82	69
Abu Dhabi	18	23	2	6
Saudi Arabia	16	14	3	2
Syria	25	0	15	0
Iran	9	2	20	0
Iraq	11	0	14	0
Kuwait	4	0	6	0
Oman	11	2	9	0
Total Middle East	93	47	89	8
Burma	32	1	26	0
India	41	10	100	20
Indonesia	60	32	17	11
Japan	18	4	13	1
Malaysia	0	13	1	8
Pakistan	17	0	12	0
Phillipines	12	3	2	0
Thailand	3	5	3	4
Total Asia	195	76	179	48
Algeria	81	0	37	0
Angola	3	8	1	10
Egypt	14	22	14	8
Gabon	13	9	0	6
Libya	29	2	13	0
Nigeria	16	11	5	4
Total Africa	180	78	80	36
Australia	24	9	19	3
Total World except Canada & U.S.A.	1,079	397	722	234
Canada	195	5	244	2
U.S.A.	2,861	244	993	101
Total World except CPE's	4,135	646	1,959	337

Source: Oil and Energy Trends

Table 2

WORLDWIDE EXPLORATION OUTLAYS
(\$ Millions)

Average Annual
1979-86

	<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>
Amoco	1,085	555	1,640
Chevron	985	600	1,585
Exxon	825	755	1,580
Royal Dutch/Shell	610	890	1,500
Mobil	660	495	1,155
Texaco	755	300	1,055
British Petroleum	370	630	1,000
Atlantic Richfield	715	165	880
Top 8 firms	6,000	4,400	10,400
% of total	(69%)	(76%)	(72%)
Next 22 firms	2,750	1,375	4,125
Top 30 firms	8,750	5,775	14,525

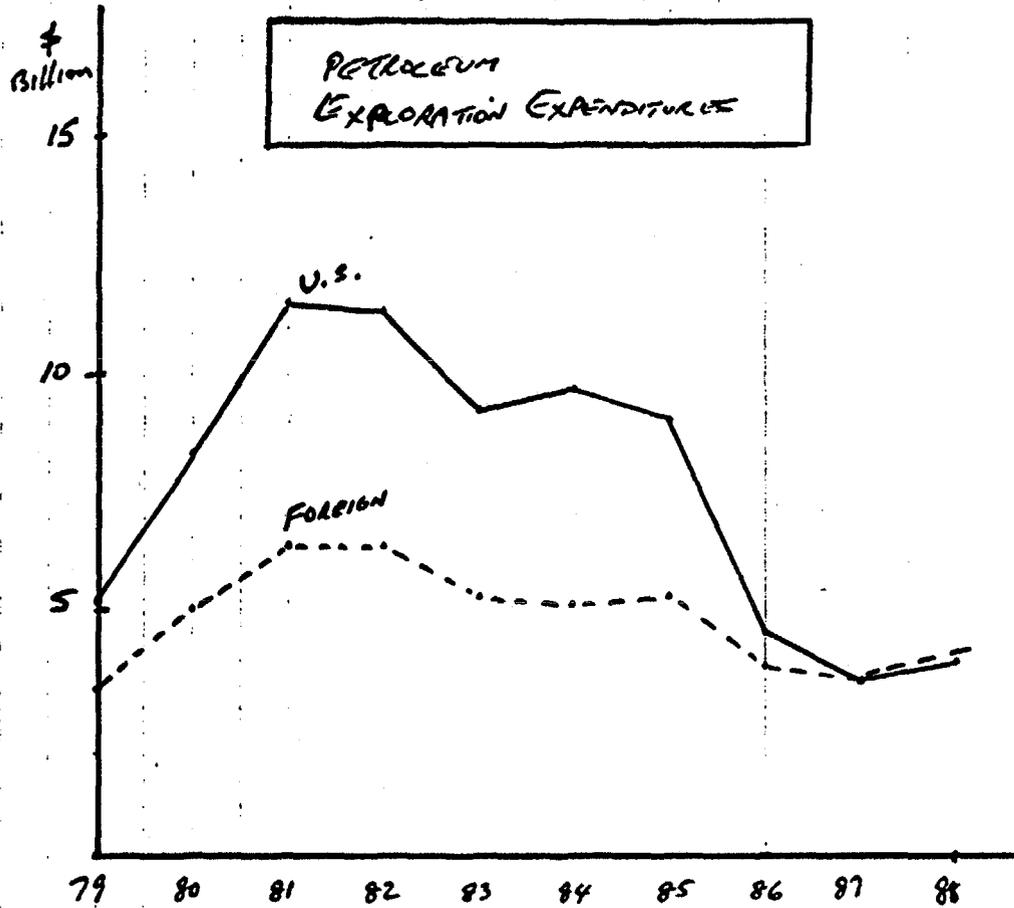
WORLDWIDE DEVELOPMENT OUTLAYS
(\$ Millions)

Average Annual
1979-86

	<u>U.S.</u>	<u>Foreign</u>	<u>Total</u>
Exxon	1,769	1,487	3,256
Royal Dutch/Shell	933	1,514	2,447
British Petroleum	803	1,012	1,815
Chevron	1,167	498	1,665
Texaco	1,035	430	1,465
Amoco	888	545	1,433
Mobil	766	542	1,308
Atlantic Richfield	1,118	163	1,281
Top 8 firms	8,476	6,191	14,670
% of total	(68%)	(75%)	(71%)
Next 22 firms	3,895	2,088	5,983
Top 30 firms	12,371	8,282	20,653

Source: Salomon Brothers Inc.

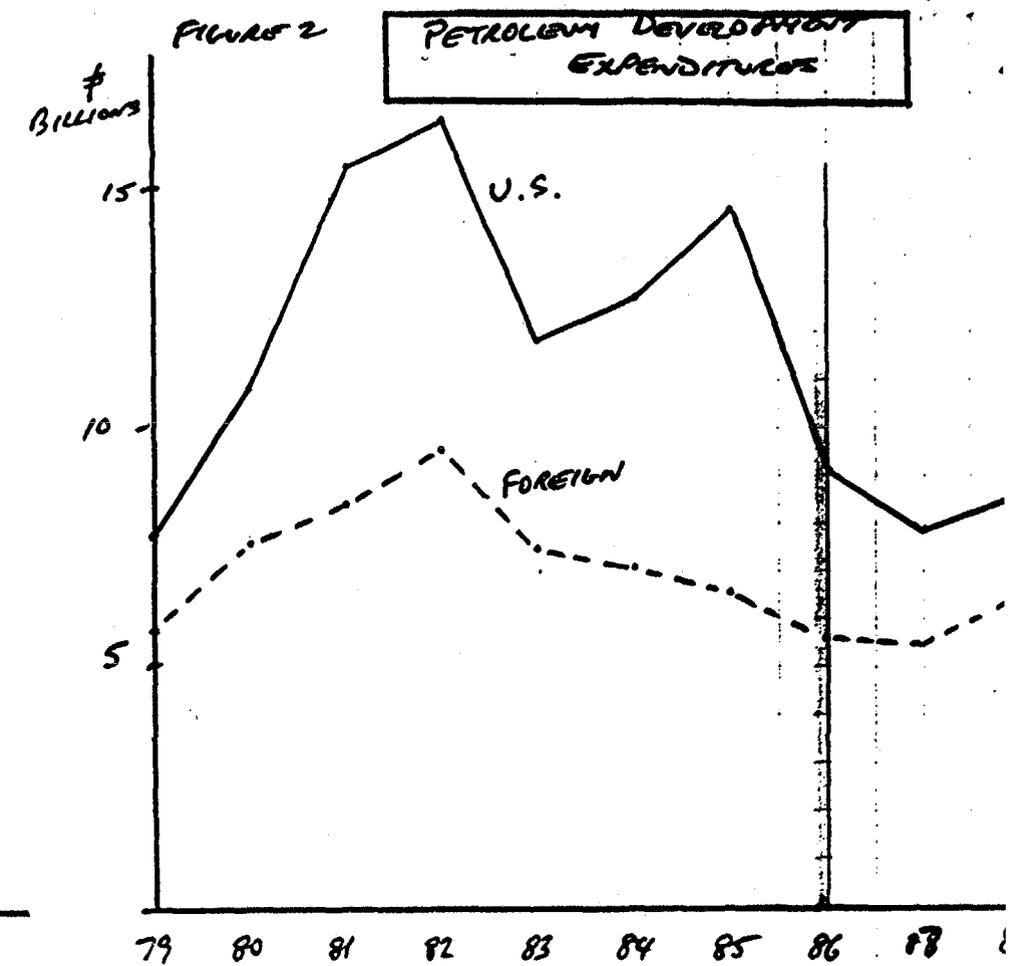
FIGURE 1.



Annual Average Expenditures. (\$ billions)

	<u>1979-86</u>	<u>1987-92</u>
U.S.	8.75	4.7
Foreign	5.77	6.0
TOTAL	14.5	10.7

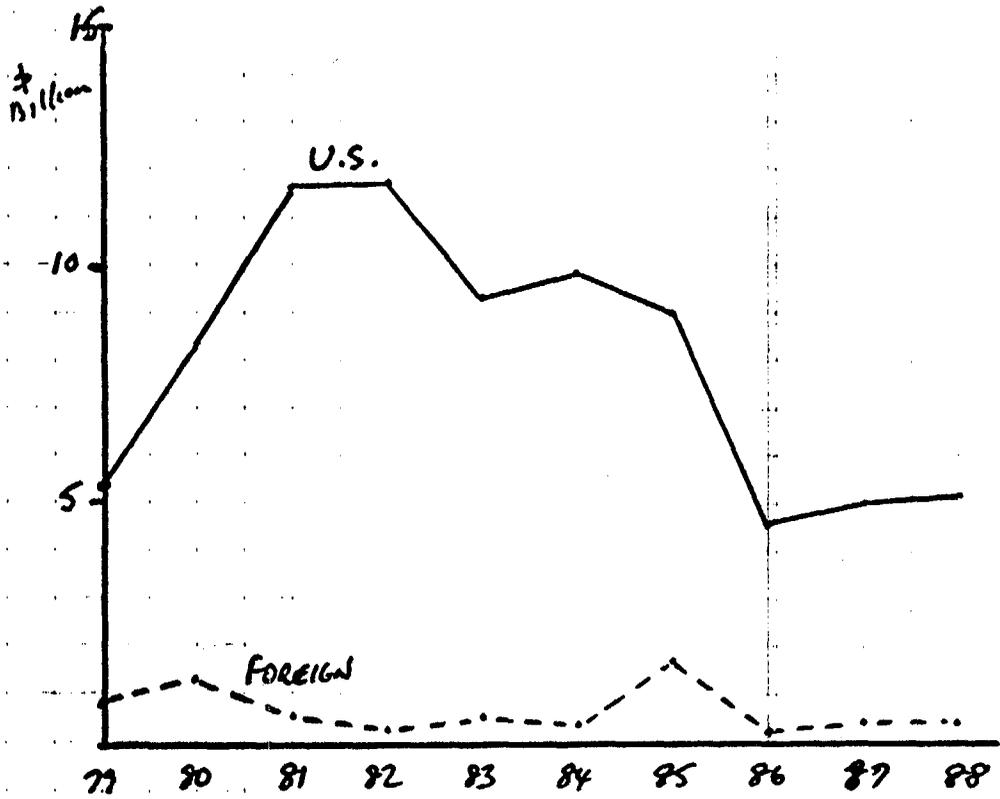
FIGURE 2



Annual Average Expenditures (\$ bill.)

	<u>1979-86</u>	<u>1987-92</u>
U.S.	12.4	8.75
Foreign	8.3	8.0
TOTAL	20.7	16.7

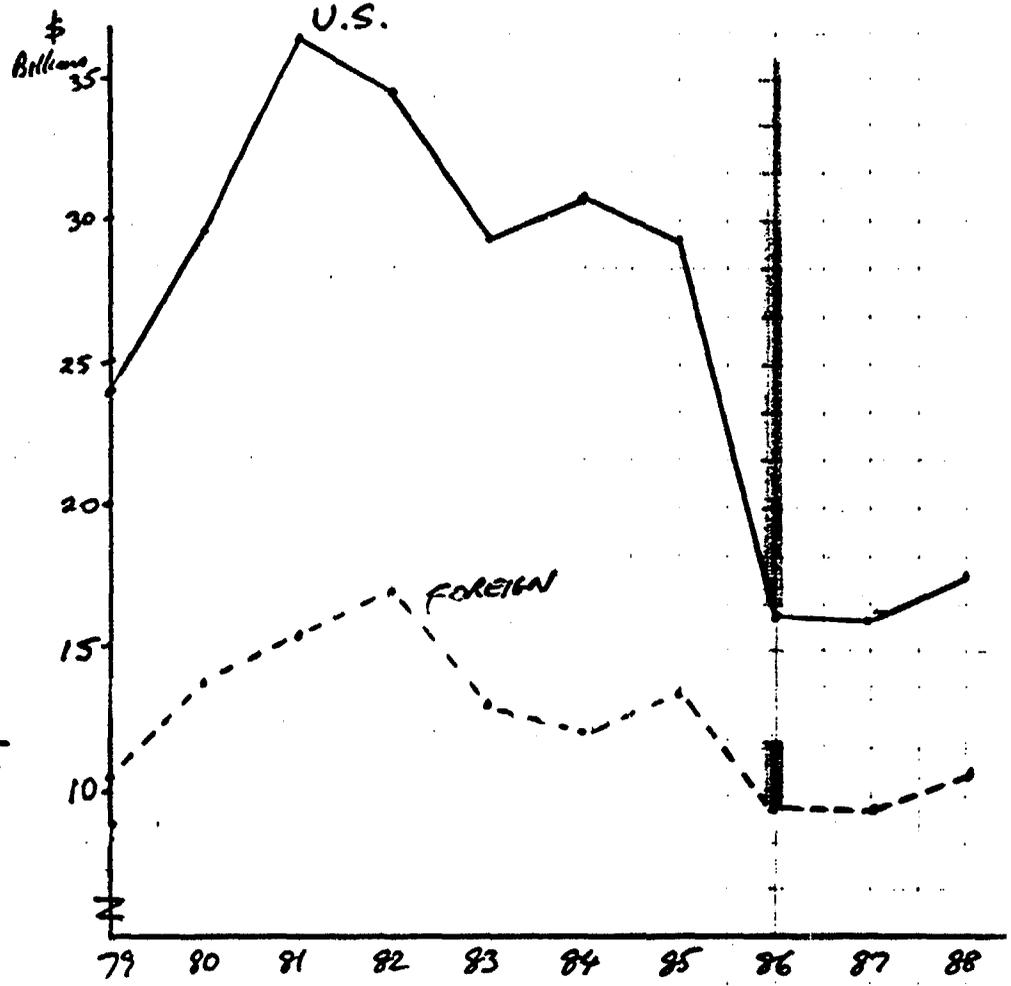
Property Acquisition Expenditures.



Annual Expenditures (\$ Billions)

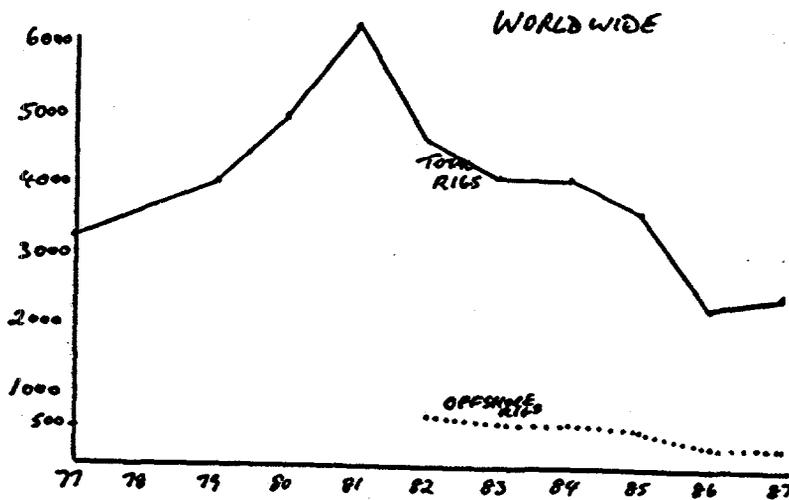
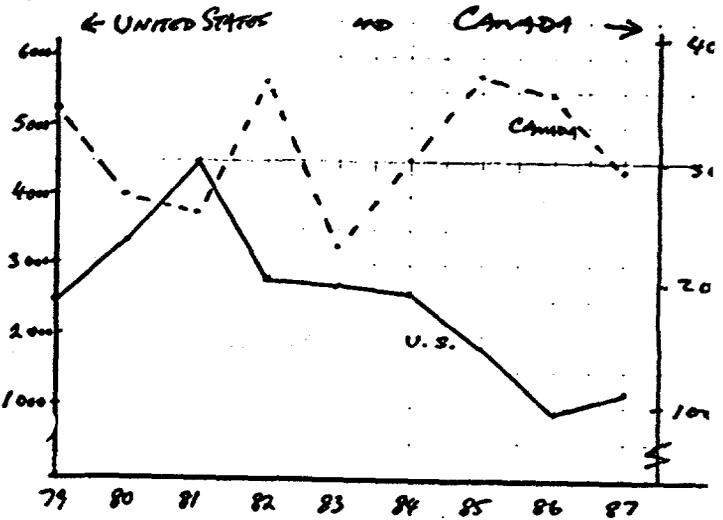
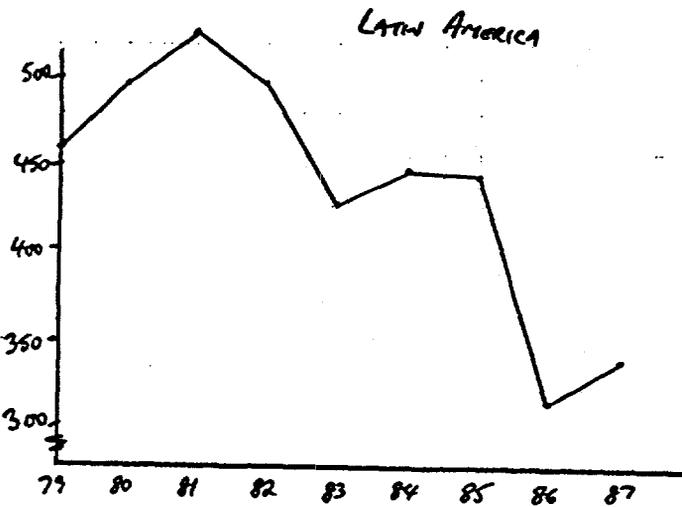
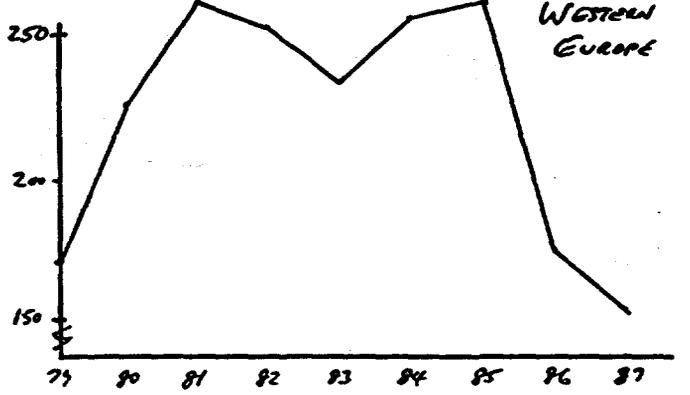
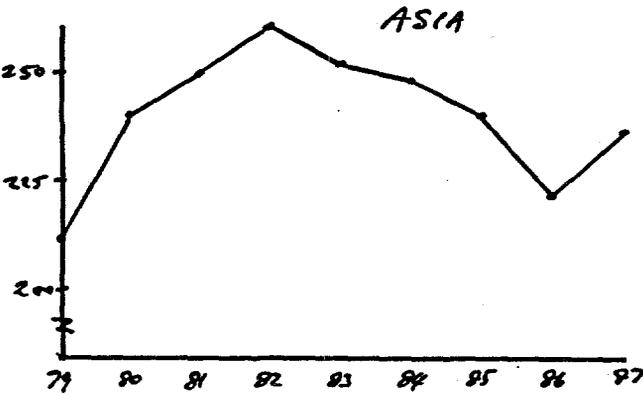
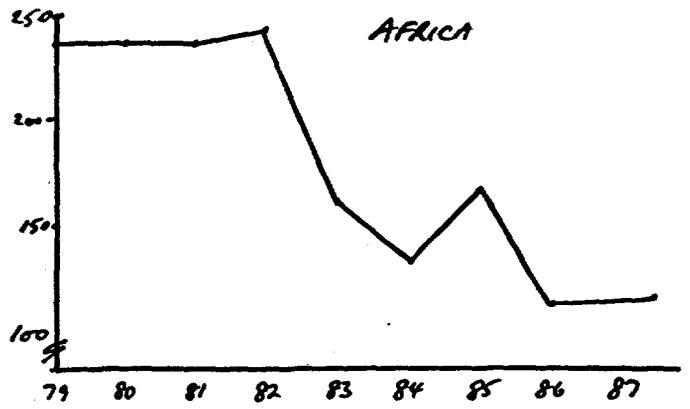
	<u>1979-86</u>	<u>1987-92</u>
U.S.	7.6	5.0
FOREIGN.	0.8	0.5
TOTAL	8.4	5.5

TOTAL UPSTREAM CAPITAL SPENDING
FIGURE 4



Annual Expenditures (\$ Billions)

	<u>1979-86</u>	<u>1987-92</u>
U.S.	28.7	18.5
FOREIGN	14.8	14.5
TOTAL	43.5	33.0



RIGS ACTIVE

FIGURE 5

FIGURE 6

NON-OPEC

Changes in Oil Supplies

MnB/D

