Economic sanctions and US international business interests*

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Introduction

In recent years, US politicians have increasingly used economic sanctions as a foreign policy instrument to affect the behavior of countries around the globe. Yet all the while, the pervasive and long-term impact of sanctions on both the US and the target countries have not been fully appreciated. The experience with sanctions on Iran presents a good context within which to examine the varied business effects of economic sanctions.

While it is generally assumed that the embargo on direct bilateral merchandise trade between the US and Iran has been the channel for economic losses to both sides, nothing could be further from the truth. For Iran, the real cost of direct trade losses are a fraction of the impact of reduced FDI, other capital flows and joint ventures. The

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impact of these non-trade effects on Iran has been significant and as a result it will be difficult for Iran and Iranian companies to go back to business as usual with the US when sanctions are lifted. Similarly for the US, the real cost of foregone direct bilateral trade is small in comparison to missed FDI and other joint venture opportunities; these losses for US multinationals are concentrated in the energy (oil and gas), petrochemicals, engineering and construction sectors; these losses can never be recouped; and these US sectors will be at a competitive disadvantage in Iran, even globally in the case of the energy sector, for a number of years to come.

US penchant for sanctions and their success

The US currently has some form of economic sanctions on about 70 countries (USA Engage 2001).[1] There are a number of possible reasons why the US is by far the pre-eminent sender of sanctions. The US is the world's foremost economic and military superpower; thus it has the potential to get countries and companies around the globe to support its political, economic and military agendas. Second, the US economy is so big, representing roughly 25-30% of global GDP, that the US market could be significant for a target country's exports, the US could be the supplier of choice for a country's imports, US capital flows could be critical to support a country's investment program, and so on. Third, the US can further affect the target country by asserting pressures on third countries and on international and regional organizations to support US policies on the target. Fourth, while as the pre-eminent military power in the world the US could resort to force in pursuing economic and political ends, it is politically preferable for politicians to use sanctions. Military engagement requires funding, could result in US casualties, or lead to further escalation, with all of this playing in the US media on a daily basis. Economic sanctions are a 'convenient' policy between diplomacy and

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[1] Another estimate is that 61 new sanctions were put in place during 1993-96 (National Association of Manufacturers 1997); at the other extreme, there is an estimate of only nine new sanctions during the same period (Helms 1999).

military engagement, whereby politicians can claim that they are doing something significant.

The hope is that economic sanctions will, in time, induce the target country to comply with US policy wishes. The optimistic expectation is that US economic sanctions will inflict a quick and heavy economic burden on the target country. The leadership, seeing the general dissatisfaction and the threat to its survival, will change its policies to comply with US wishes; or if the leadership does not change its objectionable policies, it will be overthrown and a more US-friendly regime will come to power. Rarely, if ever, do economic sanctions follow this optimistic path, instead the opposite can be at times argued – that sanctions reinforce objectionable policies of sanctioned countries.[2]

US sanctions on Iran

US sanctions on Iran have gone through a number of changes over the last 20 years. US sanctions were imposed on Iran to change various Iranian policies; these alleged policies include: *i*) Iran's opposition to the Middle East Peace Process, *ii*) Iran's support for Hezbullah and Hamas, *iii*) Iran's acquisition of nuclear and ballistic weapons, *iv*) Iran's general support for international terrorism and *v*) Iran's hostility toward the US.

Besides the initial freezing of Iranian assets, the most prominent sanctions on Iran are: the restrictions on US-Iranian trade (all imports from Iran and all exports to Iran) in 1995 the prohibition of investments in Iran and extended to third countries who violated these investment restrictions in 1995 and the Iran Libya Sanction Act (ILSA)

[2] As an example, US sanctions on Cuba have been in place for about 40 years, with no discernable change on President Castro's policies. The detractors of sanctions may argue that not only have sanctions not changed Cuba's policies or caused Fidel Castro to be overthrown, they have in fact helped to keep him in power and have thus reinforced his objectionable policies. US sanctions have afforded President Castro a scapegoat for his own economic and social policy shortcomings; by blaming the US, Castro has been able to invoke nationalistic support and thus prolong his regime. Even after 40 years, the supporters of sanctions point to the success of sanctions because sanctions have damaged Cuba economically and will eventually change Cuba's policies (with or without Castro in power).

in 1996. While the impact of trade restrictions has been the most visible, noticed, studied and debated aspect of US sanctions, we believe that the less discussed non-trade sanction policies have had a more significant and longer-term impact. These non-trade sanctions, policies and effects that we could quantify include: restricting the availability of export financing, restricting the availability of IMF/ World Bank financing, increasing the cost and reducing the availability of commercial financing, restricting Iran's debt-rescheduling efforts, impairing FDI flows (especially in the energy sector), US opposition to gas and especially oil pipelines across Iran and opposition to oil-swaps with Iran.[3]

The direct trade impact

As sanctions have embargoed almost all bilateral trade with Iran,[4] it would not be surprising to discover that in fact the value of direct trade between the two countries has declined to almost zero. Our preliminary estimates (using a gravity model) are that US exports to Iran have been reduced in the range of $ 0.3-2.4 billion (depending on the year), while the decline in US imports from Iran has varied from $ 0.7-2.8 billion. Most academic studies would cite their estimated US export reduction as a cost to the US and the US import reduction as a cost to Iran and basically stop here (Hufbauer *et al*. 1997). Such numbers are an overestimate of the reduction in overall exports of the US and Iran and are not representative of the real cost to either country.

There are a number of problems with such a conclusion. Either country could redirect its lost exports to another country, possibly at a price discount (with the size of the discount depending on specifics of the commodity and on market conditions); they could use some of the inputs to produce alternative goods for exports; or, at least, they could consume the goods domestically or produce other goods for

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[3] Effects that we could not quantify include: airline and air travel restrictions, tourism and Iranian risk assessment, in turn affecting non-energy FDI and other joint ventures.

[4] In 2000, the US lifted sanctions on the imports of nuts, dried fruits and rugs and on exports of medicine to Iran.

domestic consumption. In other words, such a loss of exports is at worst a loss in foreign exchange earnings (with much of it not a real cost) for the US or for Iran, with some of the lost exports diverted to domestic consumption. On Iran's import side, goods from other countries can be in most instances substituted for US goods or, in the rare cases where US goods are not substitutable, many of these same US goods (military equipment being an exception) can be imported through third countries (albeit at a somewhat higher price).

What has this reduced trade meant for Iran and for the US? The lion's share of Iran's exports is petroleum (largely crude oil), which has been in the range of 70-90% of total exports over the last decade (World Bank 2000).[5] We believe Iran has lost very little in oil export revenues as a result of US sanctions. Up to 1987, there were no sanctions (except for the period 1980/81); after 1987, the buyers for Iranian crude from around the world were not reduced in number (since US companies could still buy Iranian crude, could refine it, could send it to the US in refined form, or sell it to other countries as crude or refined products),[6] although the number of direct destinations was reduced – no direct imports of Iranian crude into the US. In 1995, the number of buyers of Iranian crude was reduced because US companies could no longer buy Iranian crude. If Iran did incur some initial difficulties in selling some of its crude in 1995, the effect would have been temporary and quite small. Iran's storage cost may have increased slightly and a very slight discount of less than 50 cents per barrel may have been necessary for a month or two; and given monthly exports of roughly $ 160 million to the US (the average over the previous three-year period), the loss to Iran may have amounted to $ 3-4 million per month and this may have lasted for one to two months.[7]

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[5] Unless otherwise indicated, macro, trade and population statistics are taken from World Bank (2000).

[6] As an aside observation, Iran started to report sales of crude to US companies as exports beginning in 1992. For instance, if Exxon purchased Iranian crude for delivery to the Netherlands, Iran reported this transaction as an export to the US. As a result, in 1992 Iran reported exports of $ 2.1 billion to the US while the US reported imports of $ 1 million. In 1993, 1994 and 1995, Iran reported respectively exports to the US of $ 1.4 billion, $ 2.2 billion and $ 762 million.

[7] In our private discussions with a renowned oil expert, he dismissed the notion that sanctions placed any significant loss on Iran. To his mind, any loss was more likely to have been due to prevailing market conditions when Iran switched to different buyers of its crude.

Undoubtedly, the 1987 presidential order affected Iran's non-oil exports, but by how much? It is important to note that a number of Iranian goods come into the US through the United Arab Emirates (Dubai). We estimate that the presidential order of 1995 may have reduced Iran's non-oil exports to the US (after accounting for re-exports through Dubai) by $ 25-110 million annually.

On Iran's import side, the 1987 presidential order barred basically fourteen categories of exports to Iran, and it was the 1995 order that embargoed all exports to Iran. What did this mean for Iran? Clearly, Iran could not buy US goods directly from the US but had already reduced its reliance on US goods (at least directly) after the revolution. In response to economic sanctions, Iran shifted its imports to other sources and expanded its imports of US goods through the UAE, with an estimated mark-up of imports of US goods through Dubai of about 20%.[8] We estimate this loss to be in the range of $ 12.5-50 million annually.

As for the true impact on US exports, it is far more difficult to estimate the loss in foreign exchange because it is not possible to track US exports as they would have been much more diversified than Iran's exports of oil to the US.[9] But still, it is clear that at worst this would represent a loss in foreign exchange earnings and such a loss in foreign exchange earnings would be much less than the size of the short-fall in actual exports to Iran.

In assessing the impact of US sanctions, the preoccupation of most academics with reduced direct bilateral merchandise trade appears to be inappropriate. The focus on direct bilateral trade hides the fact that US and target country goods can be and are trans-shipped through third countries.[10] Moreover, in the case of many export commodities, a sanctioned country can lower its price, change its marketing and distribution, and sell to countries other than the US. But again, whatever the size of reduced exports for the sanctioned country, they should not be seen as a total cost because many of these goods could be consumed domestically or the inputs could be redeployed to produce other goods.

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[8] Provided by an Iranian businessman residing in Dubai for a number of years.

[9] Still, some US exports continued to come through Dubai and through other countries (with some being smuggled).

[10] Smuggling is also a significant channel for getting around embargoed bilateral trade.

The non-trade effects

While the true cost of trade effects of sanctions may be low for target countries (especially with fungible exports in limited supply) and for the US, the same cannot be said for the aggregate effect of non-trade elements.

i) *Export financing*

There has been no US export financing available for Iran from the US Export-Import Bank since 1990; this may have also reduced export cover from other countries and increased the perceived risk of Iranian financing. Using Letter of Credit (LC) confirmation fees as an approximation for the loss of export cover, we estimate these losses to be in the range of $ 11-51 million, depending on the year (see the Table). These are real losses for Iran, the sanctioned country, but the US has lost nothing (except lower exports to Iran accounted for in reduced bilateral trade). Sanctions that embrace trade financing clearly have an effective impact on the target country, but not on the US (except with regard to US exports, already accounted for).

ii) *World Bank financing*

Severed US-Iranian relations have essentially meant that since 1980 the US has opposed any assistance to Iran from the World Bank. This has impeded investments totaling $ 1.09 billion. On the one hand, if Iran could have financed these projects with assistance from the World Bank, its interest rate would have been roughly 7%. On the other hand, Iran's cost of capital in 1999 was 9-9.25% on the private markets.[11] Thus the estimated cost to Iran of US pressures was roughly (9.0-7.0%) x $ 1.09 billion for the term of these loans, namely, $ 21.7 million annually over the life of the projects. US sanctions and opposition to World Bank financing has hurt US companies by excluding them from these potential projects.

iii) *Cost of commercial financing*

US sanctions have increased Iran's cost of capital for a number of reasons. The withdrawal of US commercial banks from lending to

[11] All of this information was obtained from The World Bank.

Iran would mean less competition to supply Iran with capital and thus a somewhat higher cost. A higher Iranian risk imparted by US sanctions could affect third countries' assessment of Iranian investment risk, again increasing Iran's cost of borrowing. Based on information supplied by a Middle Eastern banker who has lent to Iran, we estimate, albeit unscientifically, that Iran's cost of capital may have been adversely affected by US sanctions in the range of 0.50-0.75%. We therefore estimate the additional borrowing cost to Iran in the range of $ 29-164 million, depending on the year. Thus sanctions have had a significant effect on Iran's cost of capital, while imposing little burden on US financial institutions. This same effect can be expected in the case of other countries under US sanctions.

iv) Higher debt rescheduling fees

During the period 1993-95, Iran's ability to finance its external debt deteriorated because of low oil prices, depreciation of the dollar and a surge in imports. In 1993-94, Iran wanted to generally reschedule its official debt under the auspices of the Paris Club as opposed to a number of bilateral reschedulings. The US opposed the Iranian request, and Iran was forced to take a bilateral approach. It appears that at least Iran's interest payments (on its stock of official debt) were higher by 0.5%, depending on the year, translating to an annual burden of $ 8-55 million. US objections to Iran's Paris Club rescheduling did not translate to a loss for US interests.

v) Reduced FDI

Sanctions have reduced the overall attractiveness of investment in Iran and this has been especially the case because of US threats of secondary boycotts on countries and foreign companies that do not support US sanctions. Still, with all of these negatives, Iran has attracted investors to its energy sector – over $ 5 billion committed in total investment for the three phases of the South Pars gas field. In 1999, Elf and Agip agreed to invest $ 1 billion to develop an offshore field (Doroud); Elf, Agip and Bow Valley Energy are investing $ 300 million to develop another offshore field (Balal); and in late 1999, Shell signed a contract to redevelop two other offshore fields (Soroush and Nowruz). Between Pars and these offshore fields, committed FDI in the energy sector during 1997-99 has exceeded $ 7 billion. With the announcement of the discovery of the Azadeghan oil field in 1999, with reserves initially estimated at up to 25 billion barrels and a capacity of 400,000-500,000 barrels/day and most recently revised upwards by some estimates to 95 billion barrels in reserves and a capacity of 1.2-1.5 million barrels/day, Iran will continue to attract foreign investors for its energy sector.[12] While sanctions have reduced the level of FDI in Iran's energy sector, their most important effect on Iran's energy sector might have been a slowdown in FDI through delayed or postponed FDI (Iran's giant North Pars gas field is still not under development). The story is different when it comes to FDI outside the energy sector. Iran has not attracted a significant volume of FDI.

What proportion of the shortfall in FDI is due to Iran's policies, to US sanctions and due to other factors outside Iran's control? What has been the cost to Iran of lower FDI resulting from US sanctions? Investments in the energy sector should be separated from other investments. In the case of the energy sector, investments (with the exception of the trans-Iranian pipeline for Caspian oil) are moving ahead. These investments (totaling roughly $ 10-12 billion if North Pars is also included) have been delayed by about five years. What did these delayed (in the case of the energy sector) and reduced (in the case of the non-energy sector) FDI mean for Iran? In the case of the delayed FDI, we estimate the loss at roughly 7% (as a discount factor) of the FDI that was delayed, thus $ 700-840 million annually; but these losses are of limited duration and disappear when the projects come on line. In the area of non-oil FDI, our best guess is that FDI in Iran would have been on the same order as that in Egypt (excluding the energy sector). Thus Iran may have lost about $ 0.5-1.0 billion per year in FDI in recent years. We can, however, say that under better political circumstances (including the absence of US sanctions), much higher FDI might have been possible. This could have been especially the case with the development of the South and North Pars fields and peripheral petrochemical complexes. This would have benefited Iran. Moreover, it would have benefited the profits of US companies and could have resulted in significant exports to Iran.

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[12] Initially the Azadeghan field was to be developed by CONOCO, but after ILSA was adopted by the US banning US investments in Iran's energy sector, the field was transferred to Japanese interests.

vi) *Pipelines across Iran and oil swap*

Three of the five Caspian littoral countries (Azerbaijan, Kazakhstan and Turkmenistan) are landlocked; only Iran and Russia have access to the seas. There are a number of routes for taking Caspian oil to market through pipelines. The most prominent routes are through Turkey (Baku-Ceyhan), Afghanistan-Pakistan, Iran, and expanded routes through Russia (Baku-Novorossiisk) and Georgia (Baku-Supsa). The US has supported the Baku-Ceyhan route, while most oil companies in private support the Iran route as the most economic because of the cost of construction, the number of countries to be transited and the location of the terminal and its existing facilities. Assuming this to be the case, what has Iran lost (or will Iran lose) because of US opposition to an Iranian oil pipeline route? Iran's potential benefits are pipeline construction in Iran, pipeline operation and maintenance in Iran, annual payments for transit and loading fees, and business reputation enhancement for Iran.

The cost of the Baku-Ceyhan route is placed at $ 3.2 billion (*Petroleum Economist* 2000). We estimate a $ 2.0 billion cost for a 1-million barrels per day (b/d) pipeline through Iran.[13] This $ 2 billion of FDI would involve $ 600 million in Iranian contracts over roughly a two-year period, or $ 300 million of contracts per year. Our estimates for pipeline operation and maintenance are on the order of $ 50 million/year. As to transit fees, loading fees and annual lump sum payments, our best guess – looking at historical discussions (Stevens 2000) and talking to various executives – is a number close to $ 1 per barrel. This number is a matter of negotiation and also depends on the attractiveness of alternative routes. Finally, we assume that the volume would be on the order of 1-1.5 million b/d. We summarize these results in the Table.

In addition to these benefits from pipelines, better US-Iranian relations could allow Iran to swap oil from Caspian sources (for its northern refineries) for Iranian crude on the Persian Gulf. Based on current refinery deliveries, Iran could today conservatively use 500,000 b/d of Caspian crude for its northern refineries and this could be conservatively expanded to 750,000 b/d in two years. In the past such a swap could have benefited Iran to the tune of $ 0.50/barrel or

[13] This estimate was provided by a senior executive of one of the largest global engineering firms.

roughly $ 90 million per year and could conservatively increase to $ 135 million per year in 2002. The annual loss from oil swaps ($ 90-135 million) and transit fees ($ 365 million) are financial losses, whereas the annual loss from construction and maintenance ($ 50-350 million, depending on the year) is only largely a loss in foreign exchange because Iran would have to devote real resources to these endeavors.

vii) *Summary of the non-trade impact of sanctions on Iran*

In the Table, we present a summary of our estimate of the direct and indirect impact of US unilateral sanctions on Iran. Depending on the year, the annual cost to Iran of US sanctions ranges from a low of $ 900 million to a high of $ 1.5 billion.[14] These estimates exclude the effect of a number of factors resulting from sanctions, which we could not quantify such as the impact of reduced non-energy FDI. Still, these figures are quite revealing with regard to the relative size of trade losses and other losses to Iran because of sanctions. Our estimate for annual export losses is $ 25-110 million. Moreover, as mentioned earlier, export loss figures are more precisely losses of foreign exchange, whereas most of these non-trade losses are both a loss of foreign exchange and a loss of net resources.

viii) *Summary of impact of sanctions on the US*

Ruptured US-Iran relations and sanctions may have resulted in as much as $ 0.3-2.4 billion reduction in direct US merchandise exports to Iran (our estimate using a gravity model), depending on the year in question, over the period 1980-98. However, this loss should not be seen as a total cost to the US, but should instead be viewed as an upper bound of foreign exchange losses for the United States. In part, these goods could have been exported to Iran through third countries, exported to other countries, consumed domestically, or the inputs used to produce other goods for exports or for domestic con-

[14] Preeg's (1999) estimate of the impact of US sanctions on Iran is $ 1.2-2.3 billion per year during 1995-97 and $ 1.5-2.6 billion per year during 1998-2000. These figures represent losses in five categories: prohibition on US imports, prohibition on US exports, prohibition on marketing to third countries, prohibition on US investments and ILSA sanctions, and US pressures to limit economic assistance. These figures are much larger than ours; Preeg's single largest item is prohibition on US imports ($ 0.5-1.0 billion). Preeg has treated real costs and foreign exchange losses as if they were the same thing.

sumption. Most importantly, when sanctions are lifted, this level of direct exports to Iran may be expected to be restored with time.

The loss to US banks from not lending to Iran would be minimal. US banks have marginally fewer opportunities, but they could increase their loans elsewhere and get slightly less return and/or reduced risk diversification. But the cumulative effect of ruptured financial relationships, if continued for some time, could impose a cost on the US, especially once Iran's economic performance improves.

The implied losses for the US energy industry from non-participation in Iran are somewhat different than those for Iran. The US energy industry can no longer participate in South Pars (as all phases are already contracted) and North Pars, Doroud, Balal, Souroush, Nowruz and Azadeghan. All of this is a tremendous loss for the US energy industry. It could be further magnified because over time non-US firms will have much more information on and familiarity with Iranian oil and gas fields. Thus, even when sanctions are relaxed, US firms will be less competitive in winning related and new projects in Iran. To place a rough estimate on the losses for the US energy industry, we assume that the US could have won about 60% of these projects and that the extra (above opportunities in the US) return would have been 10% on the total investment. This results in a figure (loss of profits) of about $ 600-720 million as of now (namely, excluding new projects) and this loss will continue to accrue even after sanctions are lifted. From this figure, we have excluded the estimated losses associated with the transfer of Azadeghan field from CONOCO to Japanese concerns. This is the largest field discovered in the world over the last 25 years. We estimate that CONOCO's profits will be affected to the tune of $ 0.75 per barrel of output from Azadeghan; this will result in a loss of $ 1.1 billion per year when the field is in full operation in about five years. In addition to the fact that the $ 1.1 billion figure is large, the negative impact on the international competitiveness of the US oil industry will be felt for decades. As to FDI in the non-energy sector, we believe that the situation is very different. US corporations could have found attractive alternative investments elsewhere.

US companies would be the major beneficiaries of any pipeline (Trans-Iranian or otherwise) construction. If US sanctions in the end meant that a Baku-Ceyhan or some other non-Iranian route is chosen, then US companies (engineering firms and oil companies) may lose little if anything. If, however, US sanctions mean that pipeline construction is postponed for a number of years, then a loss will be felt. But even in this case the maximum loss (spread over a number of years) to US firms is the difference in the construction cost of the Baku-Ceyhan route and an Iranian route (since theoretically the US government could pay this and the pipeline would go ahead). This cost difference is estimated at $ 1.2 billion spread over three years; we assume that a range of 0-50% of this could accrue to US companies. In the case of oil swaps the outcome will depend on relative negotiating skills; we assume that the oil companies would receive a benefit equal to that of Iran (with 50% of this benefit accruing to US companies, for a figure of $ 45 million per year and increasing to $ 67.5 million in 2002). These results are summarized in the Table; these loss figures exclude the losses associated with the Azadeghan field and thus the annual loss figure could conservatively rise to over $ 2.1 billion by 2006. As in the case of Iran, the major loss for the US may lie in the long-term impact of unqualifiable items, namely, ruptured business relations on developing and financing projects and supplying the real resources required; these losses, while exceeding estimated direct trade losses, will continue for many years after the lifting of sanctions.

Conclusion

Over a period of 20 years, US sanctions on Iran have had a large economic cost for the US as well as for Iran. Direct merchandise trade between the US and Iran has declined significantly, but the real cost of sanctions to Iran and the US is not a result of reduced bilateral trade since much of this trade has been diverted to third countries. What net loss in trade remains should be viewed more precisely as a loss in foreign exchange earnings as potential exports could at worst be consumed domestically. The real cost of sanctions for both countries, however, is a result of impeded FDI, missed joint venture opportunities and broken financial relationships. These costs are likely to accrue even after sanctions are lifted, while bilateral direct trade may be restored much more quickly.

TABLE

SUMMARY OF LOSSES FROM US SANCTIONS FOR IRAN AND THE US*
(Millions of US dollars)

Effect on Iran	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Official export Financing	36-51	34-48	16-19	11-18	11-18	11-18	11-18
World Bank lending	?	?	?	?	22	22	22
Commercial financing	109-164	83-125	59-89	72-108	54-82	29-43	20-30
Rescheduling fees	55	45	30	18	10	8	?
FDI (energy sector delayed)	700-840	700-840	700-840	700-840	700-840	700-840	700-840
Oil pipeline	?	?	?	?	300	300	415
Oil swaps	90	90	90	90	90	90	315
Total	990-1200	952-1148	895-1068	891-1074	1187-1362	1160-1321	1303-1460

Effect on the US**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
FDI (non-energy sector)	5-10	5-10	5-10	5-10	5-10	5-10	5-10
FDI (energy sector)	600-720	600-720	600-720	600-720	600-720	600-720	600-720
Oil pipeline	110-140	110-140	110-140	110-140	110-140	110-140	110-140
Oil swaps	90	90	90	90	90	90	135
Financial services	?	?	?	?	?	?	?
Intangibles	?	?	?	?	?	?	?
Total	805-960	805-960	805-960	805-960	805-960	805-960	805-1005

* For Iran these figures represent estimated real costs to Iran. Iran's total exports (non-oil) are somewhat lower due to sanctions but these are more precisely a loss of foreign exchange as opposed to a real burden. These lower estimated total export figures are in the range of $ 25-110 million annually. Similarly, while we cannot estimate the cost of foregone non-energy sector FDI to Iran, we estimate the loss in foreign exchange at $ 0.5-1 billion per year. For the US, these figures represent estimated real costs to the US Losses associated with energy sector FDI can be expected to continue for a number of years even after sanctions are lifted. US total exports are lower due to sanctions, but these are more precisely a loss of foreign exchange as opposed to a real burden.

** The total figure for the US excludes the effect of the Azadeghan field, which is estimated to be about $ 1.1 billion per year by 2006.

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