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## Development of Telecommunications Policy in Iran

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### 11.1 Introduction

Advanced communications and information technologies are transforming the world economy with socially and politically compelling effects. These technologies are catalysts of an ongoing transformation of the macroeconomy in which information is replacing manufactured goods as the major product. Accordingly, telecommunications—as the basis for the new infrastructure—is regarded as central not only to communication generally but also to the entire information-producing sector of the economy.

Iran is the largest non-Arab Muslim country in the Middle East. It has 60 million people occupying 1.5 million square kilometers, an area approximately the size of the United States east of the Mississippi or the whole of Western Europe. More than half the population is concentrated in urban areas, while around 25 million live in the countryside. Its geographical position as a bridge connecting Europe, Asia, and Africa has made it strategically important in the region. In addition, its many natural resources, including vast oil and gas reservoirs and a gross national product of more than \$100 billion annually, have made it a potential economic and political power. Finally, its long and uninterrupted history and rich cultural heritage have contributed to Iran's importance as a center of Islamic thought.

In the broader context of an information society, however, the economic repercussions of an ever-larger information flow are just one aspect of a complex set of implications. Developments in telecommunications and telematics increasingly are seen as critical factors affecting a range of concerns from social progress to the strategic balance of power among nations. Globally, these developments are having a profound impact on the relations between individuals, groups, organizations, and nations.

The relationship between telecommunications and the state has been an uneasy one in the Islamic countries of the Middle East. In this region, the modern state has played a major role in only two ways: (1) the institutions dealing with communication in general and telecommunications in particular have been used to

represent "modernization" and development as the state sees fit, and (2) communication also has been utilized to preserve and legitimize the state and its authority, especially in relation to internal and external security, and more recently to expand trade and international finance.<sup>1</sup>

Since the introduction of the first telegraph lines in 1864, Iran's telecommunications infrastructure has remained a state monopoly. However, five major historical factors have influenced its development: (1) rivalry among the European powers to achieve hegemony in the region and protect their colonial interests; (2) frequent authoritarian governments in Iran itself; (3) government-controlled post, telegraph, and telephone (PTT) systems and administration; (4) national development projects; and (5) the Islamic Revolution and the reconstruction plan that was formulated following the Iran-Iraq War.

## 11.2 The Influence of Europe

Because Iran stands as a crossroads between Europe and Asia, it was one of the first nations in the Middle East where telegraph lines were installed, connecting its capital, Teheran, with a number of major cities, such as Tabriz, Isfahan, Mashed, and Shiraz. The telegraph lines were operated by the British under the concession awarded by the government. One result was a significant change in the structure of communications and the role played by the state, especially in the decade after 1860. News of local events now reached the central government daily, while the state-owned media became conscious of national and international news. At the same time, ideas about "modernization" and reform gradually spread throughout Iran owing to increased contacts between local elites and their counterparts in Europe.

Sir Percy Sykes has described how Iran's first telegraph line was constructed as part of a line linking England and India.<sup>2</sup> According to Sykes, during the Indian Mutiny, England was in dire need of direct telegraphic communication with its colony, and in 1859 attempted to lay a cable across the Red Sea that would connect with a submarine cable stretching from Marseilles to Alexandria. This venture failed, however, owing to its high cost and keen competition with the other major European powers, especially Germany, which was very interested in expanding its influence in the Middle East.

At about the same time, Turkey realized how useful the telegraph could be in controlling her widespread and expanding empire and decided to construct a line from Constantinople across Asia Minor to Baghdad; Turkish officials also proposed that the British government extend it as far as India. The plan was gladly adopted, and in 1863 the Overland Telegraph Convention was concluded at Constantinople and was signed by Turkish and British officials. Ultimately, however, an alternative line was constructed that ran across Iran and connected at Bushire with the cable to be laid down in the Persian Gulf. This was done by the British government for strategic reasons, as Bushire, an important port in the Persian Gulf, connected the navigation and trade routes of India. British officers then negotiated with the Iranian government for a circuitous line running from the

Iranian frontier near Baghdad to Kermanshah, Hamadan, and Teheran, the capital, and from Teheran to Bushire on the Persian Gulf. By the end of 1864, exactly 20 years after the invention of the telegraph by Samuel F. B. Morse, Iran's first telegraph line was operational.

In 1870 Siemens Brothers in Germany initiated an expansion of the Iranian telegraph system when they concluded agreements with the British and German governments to rent wires running between London and the Russian frontier at Alexandrovsk. From there they constructed a double line via Odessa, Tiflis, and Tabriz to Teheran, where it joined the already existing system. The lines operated by the Indo-European Telegraph Company, a consortium of European investors lead by Britain, made possible direct communication between London and India, since Bushire was connected by submarine cable with Jask, another port on the Persian Gulf, and from there with Karachi both by a land line and by cable. During the later years of the nineteenth century, Iran laid other lines, which were managed by the newly established Ministry of Telegraph, and received an annual royalty that covered the entire cost of foreign and domestic transmissions.

Internationally, these telegraph lines transformed Iran from an isolated kingdom into a participant in the international arena and accelerated its reception of ideas from Europe. Locally, the telegraph established a communications network that facilitated the exchange of news and the dissemination of information. In so doing it strengthened the central government because the news of local happenings could now reach Teheran daily, which gave the government better control over local authorities. As for the press, the lines increased access to national and international news. As early as 1875 government newspapers published news telegraphed from the provinces, and in 1876 the *Ruznameh Dowlati (The State Journal)* contained a full page of provincial news, much of it received by telegraph.

Interestingly, a peculiarly Iranian tradition of protest known as *bast*, or sanctuary, which has managed to survive even the enactment of twentieth-century codes of law, ultimately became associated with the telegraph. The wires were supposed to end at the foot of the throne in the royal palace, and for this reason the telegraph offices became *bast*, or sanctuaries, thus providing a certain defense against oppression. Ever since, the *bast* of the telegraph offices has been one of the most powerful and effective tools of protest in Iran.

For example, the Iranian Constitution of 1906 was granted after the people had taken sanctuary in telegraph offices throughout the country, congregated there, refusing to leave until their demands had been granted. Landowners who believed that they had been dealt with unfairly by the tax assessors also took *bast*. Traditionally, newspaper editors whose papers were censored, confiscated, or suppressed could take *bast* at telegraph offices, sending wires to the authorities and demanding freedom. In the contemporary history of Iran, political figures, too, have taken *bast*, using this method of passive resistance and protest to express their ideas and opinions.

With the advent of the telegraph, Iran had to confront some serious challenges to the growth of its telecommunications and the formulation of a national telecommunications policy. For one, the lack of telecommunications facilities during the last decades of the nineteenth century and the early part of the twentieth

century made it difficult for the central government to gain and maintain administrative control over the provinces. This lack of national network was also responsible for the erosion of interstate trade and the slow pace of bureaucratic and national integration. The fault lay partly with those European countries competing for access to a strategically located Iran that connected Europe to Asia and, through the Persian Gulf, to the Indian Ocean and Africa. By seeking concessions to build communications and transportation facilities for their own financial and security reasons, the colonial powers, especially Britain and Russia, hampered the country's attempts to establish a national communications network. A succession of authoritarian but centrally weak Qajar kings (1798–1925) played along with the European concession seekers, further impeding the development of telecommunications on a national scale.

To better understand the challenges Iran faced, we must first look at the conditions under which its initial telecommunications infrastructure was formed. Anglo-Russian rivalry was a prominent feature of the political scene, as each side sought to prevent the other from controlling the Iranian government or absorbing pieces of Iranian territory. This rivalry also took the form of economic penetration, since the fast-growing industries of the West demanded access both to raw materials and to new markets for their manufactured products.

As a result, nineteenth-century Iran became a buyers' market for commercial concessions as the shahs discovered that their extravagances could be financed in this way. As early as 1870 Nasser-u-Din Shah, one of the Qajar dynasty that ruled Iran from 1789 to 1925, was considering a number of concessions proposed by Britain and Russia, although such openhandedness to foreigners was discouraged by widespread protests against the King as well as by the rise of nationalism and various Islamic movements.

Nevertheless, in 1872 Reuters, a British-based company engaged in banking and one of the first owners of a major news agency formed in Europe, obtained from Nasser-u-Din the right to construct railways and streetcar lines, to exploit minerals and oil for a period of 70 years, and to manage the government's communications networks, including those of the customs services, for 24 years. Nasser-u-Din Shah acted without consulting national and religious leaders, since there was as yet no parliamentary system in Iran and the shah ruled by decree only. But the agreement was canceled after a public outcry.

Another example of European influence on Iranian communications was the postal system. Until 1874 it was in the hands of a quasi-official postmaster whose name was Agha Chabashi. He and his agents conveyed letters and small parcels at high, arbitrary rates without any liability. Then, in 1875 the Iranian government invited two officials from the Austro-Hungarian postal department to begin an experimental service along European lines with deliveries in Teheran and a number of villages and towns where European embassies had their summer quarters. This was followed in 1876 by a regular weekly postal service between Teheran and a few northern cities such as Taloriz and Rasht. Other lines connecting all of Iran's principal cities with the capital were opened shortly afterward, and in September 1877 the country officially joined the Universal Postal Union. In 1902 the post office became part of the customs department, then administered by Belgian officials.

### 11.3 Telecommunications and the Nation-State System

The first comprehensive national plan for telecommunications infrastructure and governmental policy was inaugurated when the Pahlavi Dynasty succeeded the Qajar dynasty in the mid-1920s. Reza Shah, the first Pahlavi to rule Iran, began a modernization program that somewhat resembled the one Kemal Ataturk had devised for Turkey. This national plan called for national integration, modernization of the nation's bureaucratic infrastructure, and the secularization of society. Its purpose was to transform Iran from a fairly underdeveloped economy to a modern nation-state.

Telecommunications infrastructure was thus a major priority, and to ensure an integrated system the Ministry of Post, Telegraph, and Telephone was established in the early 1930s. There were both economic and security reasons for consolidating the telecommunications system and consigning it to a single ministry. The implicit security objectives were twofold. First, a centralized system of telecommunications was needed if the government was to ensure the regime's security and establish sufficient control over the fairly autonomous provinces to carry out its policy goals. A second reason, equally as important, was the shah's philosophy of authoritarian government, which sought to centralize all public communication in Teheran under the government so that the regime could conduct its propaganda and public education initiatives as it saw fit.

The growth of telecommunications from 1925 until the start of World War II was also accelerated by the development of national transportation systems. Helping to direct this expansion was the newly established Department of Radio and Publications under the office of the prime minister, who was responsible as well for the production and broadcast of programs over the country's only government-owned radio network.

The telecommunications system expanded even more rapidly between 1954 and 1978 under Mohammad Reza Pahlavi, who consolidated his rule after the abdication of his father Reza Shah during World War II. Military, political, and economic factors all contributed to this expansion. A pro-Western dictator, Mohammed Reza forced Iran to join the American-initiated Baghdad Pact in 1956, which included Iraq, Turkey, Pakistan, and Iran together with the United States as its associate member. However, after the 1958 revolution in Iraq, which overthrew the monarchy, the Baghdad Pact became known as the Central Treaty Organization (CENTO). Iraq withdrew from the pact, but the main aim of CENTO remained the creation of a military and security line of defense against possible attack by the Soviet Union. It was during this period that CENTO members, including Iran, together organized a regional telecommunications system that expanded communication between Iran and its neighbors Turkey and Pakistan.

Both the oil boom of the 1970s and Iran's efforts to industrialize and to expand its military presence in the Persian Gulf further helped to centralize its telecommunications infrastructure. With the expansion of satellite communications worldwide, the country established in 1972 its first state-controlled telecommunications company, known as the Telecommunications Company of Iran (TCI), which became an agency of the PTT. During the 1970s, German and American compa-

nies, such as Siemens and Bell, became very active in telecommunications development in Iran. These two companies were chosen by the government to assist Iran in the establishment of its integrated communication system and the development of its civilian and military communication networks. Yet, prior to the Islamic Revolution of 1978–1979, the system still had experienced little growth due to a lack of comprehensive planning and investment, even though the population doubled between 1950 and 1980. Personal and residential telephone use was still a luxury.

#### 11.4 Telecommunications Policy and the Postrevolutionary Years

Since the Islamic Revolution, institutions involved in the telecommunications policy-making process in Iran include the Ministry of Islamic Culture and Guidance, and scores of related governmental agencies under the ministries of commerce, national defense, information, and, of course, PTT. In particular, the new Iranian government has stressed the expansion of telecommunications for both internal and external use. Prior to the revolution, for example, only 28 cities were directly connected to international telephone lines, while the number of cities and towns using automated dialing in 1986 reached 70. The Iran-Iraq War of 1980–1989 considerably hampered the development of telecommunications in Iran while the rest of the world economy became increasingly integrated. Nonetheless, TCI continued to standardize the telephone system, and a number of new public companies were established to produce some basic equipment for cables and switching systems.<sup>3</sup>

The TCI, which operates under the supervision of PTT but has somewhat independent status, is responsible for all the standardization, production, and distribution of telecommunications equipment. Its director and board are appointed by the minister of PTT in consultation with the president of Iran. Its policy in recent years has been to encourage domestic production of telecommunications equipment by the private sector, but its overall direction is far from the process of “liberalization” that characterizes private investment in many other countries. Telecommunications policy in Iran remains primarily a state-owned operation. Telecommunications tariff structures in Iran are also subject to government rules and regulations and the provisions of PTT. There are no major cost subsidies for different types of services or customers, although PTT collects telecommunications revenue and channels it through the general treasury. Over the last several years, the government’s policy has been to subsidize basic telephone systems, especially in rural areas and at key educational and governmental institutions, for the country’s internal needs. In contrast to domestic services, long-distance and international tariffs have remained fairly high. Compared with other countries in the region, Iran today has one of the best telecommunications networks in the Middle East. The economic base provided by a well-established infrastructure and manufacturing sector has allowed the country to increase its public telephone network by 50% during the 1980s, from 1.1 million subscriber lines in 1979 (just before the revolution) to 2 million lines 10 years later (after the revolution). By 1990, however, Iran’s telephone density was still only four per 100.<sup>4</sup>

Now, with high-tech development one of the government's prime foci in the post-Iran-Iraq War era, developmental projects as well as national budgetary debates are focusing on telecommunications infrastructure and technologies. The current postwar goal is to provide universal service within the next decade, and both PTT and TCI have been given a mandate to achieve that end. The first step of expanding and digitalizing urban and backbone network markets has been achieved. By the end of 1994, Iran had added 2 million new switching lines, including 1 million digital lines, to its existing system, increasing the total number of telephone lines to over 5.2 million. Since most of the funds for national development projects come from the export of oil, the amount produced and its price on the world market will determine, in large measure, whether these objectives are realized.

Another primary postwar goal has been the development of the nation's international telecommunications facilities. Air raids during the last year of the Iran-Iraq War destroyed two Standard-A earth stations at its Assadabad facility in Western Iran, but during this same period two new Standard-B earth stations were constructed in Bommehen and Isfahan. The International Telecommunication Satellite Organization (INTELSAT) now leases three transponders to Iran and will lease five more on future sixth-generation INTELSAT satellites; the country is further connected to its neighbors through a microwave network. In all, Iran utilizes approximately 860 international circuits.

During the war, Iran's microwave network expanded mainly by adding analog equipment in an effort to develop a nationwide network of telephone, telegraph, and television facilities. With a capacity of over 60,000 microwave channels, the network serves 300 locations. Simultaneously, Iran's PTT has installed an increasing number of 30-channel PCM links. In 1989 some 2,400 PCMs were added, putting the entire installed base at 3,200. During the five year plan of 1989–1993, Iran expanded its telecommunications infrastructure, serving an additional 430 towns and cities.

Iran is also planning its own national satellite project, "Zoreh," which will be completed within three to four years with the assistance of European investors, namely French, German, and Italian. In 1991 an international tender was offered for two satellites and about 2,000 small and large antennas. Iran is expected to launch its own independent satellite system by the end of the 1990s.<sup>5</sup>

Along with its digitalization program, TCI hopes to introduce an Integrated Services Digital Network (ISDN) and to further develop its computer and on-line service facilities. In 1990, a 10,000-line exchange and 20 nodes became operational. By the end of 1995, TCI spent over \$1.5 billion on switching installations.<sup>6</sup>

The Islamic Revolutionary government of Iran has placed particular importance on rural telecommunications. While over 300 villages were served under the shah, the new government nearly doubled that figure between 1979 and 1982, and by 1989 telecommunications services reached more than 3,221 villages. By 1993, more than 14,000 villages had become a part of the national network, mainly through UHF, VHF, FDMA, and TDMA radio links.

The TCI has divided the country into 24,500 hexagons and has given priority to the ones that are more densely populated—those with 5,000 or more residents.

They comprise the larger half of the group, about 3,220 villages in all, and will be provided with telephones over the next 12 years according to the TCI proposal. By 1998–2002, officials hope that a telephone will be available to residents of every hexagon that is within a radius of 5 km from any populated village.

In addition, a domestic satellite system was on-line in 1992. It provided both television and telephone services to areas that could not be reached by ordinary radio or cable transmissions due to difficult terrain and brought local telecommunications to a total of 56 villages. To support this system, three 72 MHz Ku-band transponders were purchased from INTELSAT in 1988. Rural telecommunications programs are expected to stimulate the demand for UHF/VHF and TDMA radio links, VSATS, and other telecommunications equipment.

Currently, Iran has approximately 35,000 rural subscribers who are served by 241 PABX and 19 manual exchanges. In addition, there are now over 1,000 UHF and VHF links and 850 open-wire line carrier systems serving rural telecommunications centers. In 1994 there were a total of 8,741 telecommunications branches in rural centers, serving nearly 30,000 villages and small towns.

### 11.5 The Role of Foreign Suppliers

Despite a lifestyle and value system that contrast with those of the West, Iran seeks Western capital and technology to help expand and improve its telecommunications. Above all, Iran hopes to modernize its local manufacturing sector, and to this end, it is developing joint ventures with foreign suppliers to upgrade local production of switches, terminals, and transmission equipment.

Although Iran expects to expand its telecommunications market, trade restrictions and political barriers exist. In the 1980s potential U.S. suppliers found it difficult to obtain valid export licenses, so were deterred from investing there, and U.S. policy specifically restricted trade with Iran in the area of integrated circuits and components. With a total trade sanction imposed against Iran by President Clinton in 1995, there remain no opportunities for American firms to negotiate telecommunications contracts with Iran, let alone any investments.

On the other hand, German and Japanese suppliers such as Alcatel SEL, Siemens, and NEC are willing to invest in Iran's digital equipment and public switching despite the political risks in order to gain a growing share of the global market. These suppliers already have a foothold in Iran because they maintained trade ties throughout the Iran-Iraq War, and they have secured their positions by negotiating production licenses and ownership agreements with two of Iran's national manufacturing groups.

Alcatel's German subsidiary Alcatel SEL, for example, has received substantial digital switching orders from Iran. This supplier retains strong links with a number of bilateral funding sources to promote its products in Iran. In 1989 Alcatel signed an agreement with TCI that licenses its System 12 switching technology. At the rate of nearly 100,000 lines per year, this company manufactures crossbar switches modeled after a licensed Siemens EMD design. Recently, TCI ordered new S12 exchange equipment, expanding its total orders to over 530,000 lines.



In addition, the company stands as a leader in the supply of satellite-based transmission equipment through its French subsidiary Alcatel Telspace. This subsidiary sold TCI a 61-terminal domestic satellite system and an international station in 1990. Inasmuch as TCI continues to expand its satellite system into remote areas of the country and has begun planning the launch of its own satellite, Alcatel may receive further offers. Now that it has acquired Telettra, a component of Iran's digital microwave market, it can supply TCI and other private networks with digital radios and other equipment.

Another supplier, NEC, took advantage of Japan's neutral stance in the Iran-Iraq War to tap the Iranian telecommunications market. In 1973 NEC negotiated a joint venture with TCI to design and produce PCM and multiplexing equipment together with Iran Telecommunications Industries (ITI). The agreement yielded a 40% ownership for NEC, although its share has diminished to 10% since it was purchased by the Bank of Industry and Mines.

In 1990 TCI selected NEC as a primary supplier for Iran's digital microwave expansion project. Under a \$20 million contract, NEC now holds orders for well over 2,000 transceivers to be produced during the initial stage of this project, while EB Nera of Norway was awarded \$30 million for the second stage.

Siemens, a third major supplier, wants to further develop its business relations with Iran, including its prior transactions with GTE, which had installed several EAX exchanges before the fall of the shah. Siemens obtained an 80% interest in GTE's international and transmission services years ago and has invested a 20% share in the state-owned Iranian Telecommunications Manufacturing Company (ITMC), the largest equipment manufacturer in the country. Siemens received the contract for an 11,200-line EWSD exchange, and NEC got one for a 13,000-line exchange. These companies plan to set up local production facilities.

While Siemens focuses primarily on providing Iran with switching equipment, it is also seeking opportunities in the public transmission market. Siemens has already supplied TCI with 30,000 channels of 2Mbps cable systems for its distribution network, while providing equipment for a trunk fiber-optic link and pursuing other fiber system offers. Iran has also purchased low-capacity radio links from the former East Germany's RET.

In 1991 Iran signed two memoranda of understanding with South Korea and China to promote trade in the area of telecommunications. In August 1990 a \$40 million cable purchase from Chinese manufacturers marked the establishment of ties with China's government and telecommunications industry. The agreement also allows Iran to purchase Chinese teletext, facsimile, microwave, and satellite equipment. Media reports suggest that negotiations are proceeding as well with Shanghai Bell Telephone Equipment Manufacturing Co., Ltd. (SBTEMC), a joint venture in which Belgium's Alcatel subsidiary BTM maintains a 30% share.<sup>7</sup>

In an effort to encourage Korean participation in the development of Iran's telecommunications, the two parties formed the Cooperation Committee for Post and Telecommunications Development (CCPTD). Iran agreed to purchase Korean equipment, and Korea has reciprocated, providing Iran with technical training and support. The joint committee oversees Korean telecommunications sales in Iran, which will exceed the U.S. limit of \$140 million worth of fiber-optic cable.

It will be used in part to add a 10,000 km fiber-optics network to Iran's telephone system, whose subscribers, under the First Five-Year Plan, doubled, from 2.5 million to over 5 million. According to Iran's PTT, 70 additional satellite earth stations have been added to its satellite network from 1991 to 1994.

Spending by the TCI also increased under the Second Five-Year Plan (1989–1993), which focused primarily on transmission projects, representing 40% of TCI's investment, a figure that may grow in the near future. The company's microwave backbone construction project alone represents an investment of over \$100 million. Furthermore, in the fiber-optic area, TCI intends to install six fiber trunks and a number of digital intraurban cable links. All fiber is produced in Iran, while terminal equipment may be imported.

Thus even without the official assistance from the West, Iran is free to develop its telecommunications systems and to pursue positive trade relations with German, Japanese, Korean, Brazilian, Indian, Turkish, and other foreign suppliers. Netas and Teletas, Turkish suppliers with ties to Canada and Germany, may soon join the roster of companies involved in this trade, and with the easing of tensions between the East and West, prospects for Western suppliers may improve.

### 11.6 A View to the Future

Under the Third Five-Year Plan, Iran, as a member of INMARSAT, is developing its telecommunications infrastructure with the goal of facilitating the growth of its shipping industry in the Persian Gulf. This process is being accelerated with the construction of new ground satellite stations in Teheran, Isfahan, Kerman, Bandar, Abbas, Zahedan, Sanandaj, and Bushehr. The earlier ground stations already in operation in Asadabad, Isfahan, and Bumhen provided 1,300 international channels that connected Iran with 39 different countries via INTELSAT satellites. In 1983 that international satellite capacity increased to 5,000 channels, and current planning calls for an additional 200 satellite ground stations in various parts of the country to expand telecommunications capacity and establish a nationwide network of databanks.<sup>8</sup>

Given Iran's strategic position in the Middle East, its expanding population, and its ambitious postwar reconstruction plans, there is every reason to expect that the country will continue to put a heavy premium on its telecommunications structure; in fact, PTT has already established a technical telecommunications school outside Teheran. The nation's telecommunications policy will to a large extent be influenced by its evolving international economic policies as well as the bilateral or multilateral agreements that it might undertake in the areas of science and technology.

### Notes

1. M. Hamid, "Communication and the State in the Middle East," *Media Development* 33, no 3(1991):8–10.

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3. *KAYHAN SAL* (Kayhan Yearbook), vol. 2, no. 2, lines 1365–1366 (Teheran: Kayhan Publications, 1986–1987), pp. 80–87. See also the 1993–1994 volume (lines 1373–1374).
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5. *Kayhan Havai*, no. 938 (Teheran: Kayhan Publications, 1991), p. 11.
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