The Mexican Construction Industry at the Starts of the Twenty-first Century: trends and outlook

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Resumen
Este artículo analiza las implicaciones de cambios recientes en la industria de la construcción mexicana para el empleo y las condiciones laborales en el sector. Primero se describen la estructura básica y relaciones de trabajo que caracterizan la industria. Una segunda sección examina la respuesta de la industria a las crisis financieras sucesivas y a los cambios de política económica entre 1980 y 2000. Luego se considera la reorganización de los procedimientos para proyectos de obras, así como de las relaciones contractuales. Finalmente se exploran los impactos de esta reestructuración en las condiciones laborales y en las necesidades de capacitación de los trabajadores.

Abstract
This article analyses the implications of recent changes in Mexican construction industry for employment and labour conditions. First, it describes the basic structure and production relations within the industry. A second section looks at how these have responded to successive financial crises and policy changes from 1980 to 2000. The reorganization of project implementation and contractual relations, including the emergence of an integrated housing construction industry, are then considered. Finally, the impact of this restructuring on labour conditions, training and skill requirements is explored.

Introduction

This case study has been commissioned by the International Labour Organisation to provide inputs for a report on the image, employment prospects and skill requirements of the construction industry in the 21st. century. The purpose of the case study is to provide information on employment aspects in the Mexican construction industry, and especially, to explore how these have changed over the last ten or fifteen years. The ultimate aim is to contribute to a better understanding of the factors affecting the industry's image, and to find ways in which this image can be raised.

Background

Employment in the Mexican construction industry was the subject of a number of studies during the 1970´s and early 1980´s. International organisations such as the "Organisation for Economic Co-operation and Development (OECD)π and "Internacional Labour Organisation" (ILO) were concerned with the industry's job creating capacity, particularly as a result of housing programmes and other forms of public investment[1]. The upsurge in applied social research in the urban studies field also gave rise to a number of publications on the industry's development, its close ties with the Mexican state, internal organisation and employment relations[2]. Finally, a number of dissertations and other studies provided extremely useful

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insights into the labour and living conditions of construction workers, analysed from a marxian perspective, using on-site questionnaires, observation and interview techniques[3]. From these studies we have a fairly accurate account of employment conditions and labour processes in Mexican construction up to the mid nineteen eighties.

Objective

The question addressed in this study is to what extent these –rather grim- employment conditions have changed over the last ten to fifteen years. Unfortunately, academic interest (including my own) in the subject of labour conditions and processes in construction has waned considerably since the nineteen eighties. Official statistics and business literature provide an excellent account of the industry's development, especially its financial problems, but virtually ignores the question of labour. For instance, I have not found a single reference to productivity. Even the specialised construction industry literature rarely mentions labour issues, except sometimes to complain of shortages of skilled hands, or conversely, to quote the unemployment rate resulting from meagre public investment. So the labour issue needs to be approached virtually first hand, in this case by interviews with representatives of the construction industry.

Essentially, the questions concern the changes in labour processes arising out of the dominant tendencies in the industry, that have arisen since the nineteen eighties . A basic premise here would be that change usually occurs when and where there is growth. In periods of stagnation, nothing much is likely to happen on the building sites; in construction, it is easier to go out of business than adapt in order to compete in critical situations. During the last two decades of the century, successive financial crises followed by deep recessions have been accompanied by even deeper slumps in construction. Cut backs in public spending, tighter controls on tendering and competition from foreign contractors have devastated large sectors of the national construction industry. In these sectors one would not expect to find substantial changes to on-site labour practice, and this impression has been confirmed in this study. The same is true in small-scale housing and non-residential building, both in the formal and informal sectors, where traditional practice still dominates.

Some areas of construction, however, have benefited from the situation, or at least experienced rapid growth during certain periods. Two recent examples are the publicly subsidised housing sector, which has grown considerably while being revolutionised over the last two decades, and the arrival of foreign contractors who are winning engineering projects in the energy sector. Special attention will be paid to these sectors.

Building in Mexico. Basic organisational structures

Different and contrasting sectors of building: the "formal" construction industry, small builders and the "informal sector"

The strong contrasts, inequalities and heterogeneous nature of Mexican society are directly reflected in its buildings and, therefore in the way these are produced. The "construction industry" or "sector" which we will be discussing below is responsible for only a part of the built environment. It is important, then to define what we are talking about: what the data refers to and what it does not refer to.

Construction in general, or production of the total built environment, can be classified according to various criteria. Employment is a good way of approaching this, given the subject of this paper, and also because there is reasonable data on this, unlike, for example, the total value of all building produced. The three major data sources for employment in construction in Mexico provide vastly disparate figures, reflecting the different ways construction is organised. (See table 1).

a) Employment in the formal construction industry

Data on employees in construction companies is published by the Mexican Chamber of the Construction Industry (CMIC, after its initials in Spanish, formerly CNIC) on the basis of a permanent monthly sample survey of its affiliates. The results of this survey also include all the other indicators which the CMIC passes on to the National Statistics Institute (INEGI) and which are the basis for all economic indicators analysed below, including national accounts. The figures for GNP, however, refer to a wider definition of construction, including direct administration by the public

sectori, foregn contractors and small-scale builders, and at least some of the "self build" and traditional types of building. Exactly what proportions of these categories are included in the GNP model is a mystery. The cement board recently estimated that about 60% of domestic consumption is by small and self-builders, and their output is presumably accounted for in GNP via the input-output matrix. However, much traditional, rural or urban self-built construction uses waste, recycled and organic materials, or production by artisans that escapes any statistical net. Moreover, the relation between construction produced by CMIC-registered firms and total construction is variable (see below), as is that of employment.

Affiliation to the CMIC is, therefore, the nearest we can get to a clear-cut definition of the "formal construction industry" in Mexico, but even this embraces a wide variety of building concerns. Any firm tendering for a public sector or large-scale private sector contract needs to be a member of the CMIC. These firms are, however, extremely heterogeneous in terms of size, capacity, organisation and specialisation (see below). Not all the affiliates of the CMIC are building firms; planning consultants, plant suppliers, materials producers and developers, for example, also tend to be members, though these activities are not included in the quarterly survey. Since its foundation in 1943,

Table I
Different estimates of construction employment in Mexico (thousands)

	1991	1993	1995	1997	1999
1. "FORMAL SECTOR": Employed by firms registered with CMIC					
Total	448.1	506.1	281.3	298.7	293.6
Total workers	349.6	392.0	214.6	228.2	230,293
Permanent	67.8	86.1	50.9	50.2	57.3
Temporary	281.8	305.9	163.7	178.0	173.0
Total employees	98.6	114.1	66.6	70.5	63.3
Permanent	81.6	97.6	59.0	64.1	58.4
Temporary	17.0	16.5	7.6	6.3	4.8
2. REGISTERED WITH SOCIAL SECURITY					
Total construction	995.7	1,135.9	827.8	741.0	880.8
Permanent	241.1	281.9	236.9	284.9	324.7
Temporary	754.6	854.0	590.9	456.1	556.1
3. NATIONAL EMPLOYMENT SURVEY					
Total construction	1,903.9	1,952.3	2,032.5	1,819.6	2,198.0
Employed by private sector	1,756.1	1,816.7	1,699.6	1,741.3	2,120.8
Employed by government	97.6	55.5	116.3	16.2	33.1
Employed in non-specified sector	17.9	7.0	3.0	1.1	4.1
Unemployed	32.3	73.1	213.6	61.1	40.0
Registered with Social Security as % of total employed by private sector construction	52.3%	58.2%	40.9%	40.7%	40.1%
Employment in CMIC registered firms as a % of total employed in private sector construction	24%	26%	14%	16%	13%

Sources: INEGI from CMIC survey; INEGI. Yearly average from IMSS monthly data; INEGI from National Employment Survey

membership and leadership of the CMIC is dominated by contractors.

As contractors are created and disappear rapidly, this CMIC construction universe is highly variable; a total of 9,369 firms were registered in1999: just over half the number registered in 1991 (see Part 5). Equally variable is the number of people employed by these firms, given the hire and fire nature of employment in the industry. The average during that year was about 294,000 for the whole country, of which approximately two-thirds are casually-employed manual labourers ("Obreros" as opposed to "empleados"). In peak years, such as 1992, the total number employed was almost double (520,000), of which 320,000 were casually-employed workers. The extent of these fluctuations and the reasons behind them will be discussed below. Right now, the importance of these figures is that they represent what might be termed employment in formal sector construction, defined as building carried out by registered contractors, which presumably is what the OIT is interested in. However, in order to understand anything about labour conditions in Mexican construction, it should be noted that this "formal sector" employment represents only a fraction of total employment in construction, as can be seen by looking at the other sources of information.

b) Construction workers and employees registered in the Mexican Social Security Institute (IMSS)

The Mexican Social Security Institute (IMSS), which provides medical and other social security benefits to private sector employees and workers, produces monthly data based on the number of permanently and temporarily employed workers registered in the system. The figures are broken down by economic sector and region. As can be seen in Table 1, the number of people employed in construction whose employers are making social security payments on their behalf is nearly three times as much as those reported by CMIC-registered construction companies.

The explanation to this discrepancy is that most construction in Mexico is not carried out by registered construction companies but by a whole range of small-scale builders, from self-building families to micro businesses run by individual engineers and architects. All this is sometimes referred to as "informal sector": a rather misleading adjective as the most usual practical definition of "informal" is not having social security coverage! However, not all those employed by construction firms of whatever size are registered with Social Security, though it is possibly true that the smaller the business, the lower the proportion of workers covered by Social Security. The extent of this non coverage is evident from the third source of employment figures.

c) Construction employment registered in population censuses and national employment surveys

According to sample results of the February 2000 census, the economically active population (EAP) in construction, including those unemployed at the time, was about 2,754,000: three times the number of construction workers and employees registered with Social Security. Given the preliminary nature of these results and the perennial problems with census data on EAP in Mexico, the alternative annual estimates arising from the National Employment Survey (ENE) is probably a more reliable source[4].This estimates a total average of 2,158,000 employed and 40,000 unemployed in1999: still over twice as many as those registered with Social Security, and seven times those reported by the construction firms affiliated to the CMIC (Table 1). The enormous difference is due to three categories of building employment: first, the wide range of building activities not undertaken by registered construction companies and or registered with Social Security: the majority of construction workers in fact; second, those construction workers directly employed by the public sector, particularly by local authorities, who account for between 1 and 6% of total employment in construction. The third group corresponds, of course, to all those construction workers employed by construction firms, large and small, "formal" and "informal" who are not registered with Social Security[5].

Two important implications for the purposes of this study are:

First, the general image of labour conditions in the Mexican construction industry is not predominantly determined by employment by registered building contractors who would be taking part in the tripartite negotiations. Employment by these contractors represents, in fact, a decreasing proportion of total employment in construction (Table 1).

Second, whatever its image, actual labour conditions in the Mexican construction industry are still determined to a large extent by what happens within the traditional sectors. This is because the labour market is highly fluid, at least in the non residential and residential building sectors.

In the same way that workers drift in and out of building, causing yearly differences, sometimes of over 200,000, so do they shift between one kind of construction employment to another: from self employment to work with builder-architects or engineers; from there to work with a larger firm and then back to piecework[6].It is in the traditional sectors that the basic forms of recruitment, training and of control of the labour process on site are established and reproduced (see below). This is not to say that there have been no changes; there have been important innovations in certain sectors. But overall, the traditional routines still dominate, especially in most of the general building. For this reason, the following section provides a brief overview of the ways labour is traditionally organised in Mexican construction.

Employment and labour relations: recruitment, training, control, wages and work conditions

A major reference on work and labour relations in the Mexican construction industry is Germidis (1972 and 1974). My own research (Ball and Connolly 1987, Connolly 1988, and other surveys undertaken in the mid to late 1980's[7] confirm the continuity of basic traditions throughout the industry, which can be summed up as follows:

a) The maestro system:

In the basic building trades, the traditional maestro system has evolved from the guild structure, although these were formally, though not in practice, abolished from the end of the 18th. century. Previously, and during the whole colonial period, the Spanish legislation protecting the guild monopolies (which among other things prevented in theory, though not in practice, indigenous craftsmen from professing a building skill) was not widely enforced anyway. As architects and engineers emerged as professionals, they took over the design and control of building from the "maestros de obra"; ("maestro" and arquitecto is almost synonymous before the late eighteenth century). The term "maestro" became increasingly devalued, and now refers exclusively to the "overseer", separated from the architects, engineers and other building professionals by a wide class (and race) divisions, but united to their workers by close class, ethnic, family, "compadrazgo" (relation for religious ceremonies like a godparent), rural community and other ties.

The establishment of the present-day maestro system occurred simultaneously with the generalised substitution of traditional techniques based on stone, brick and adobe, by twentieth century building technologies, principally reinforced concrete. Wet construction dominates building in Mexico. The maestros play a dominant role on site, both in general building (albañilería, which is brick and blockwork, concrete work, sometimes plastering and tiling) and in specialised areas such as carpentry, plumbing and basic electrical installation. The maestro handles labour recruitment and training, as well as the immediate control of the labour process. The relationship of the maestro with the workers is therefore very powerful, though the resulting labour condition can be very variable, depending on the individuals concerned. Sometimes the maestro will look after his workers' welfare, in an almost paternalistic manner; in other cases, the maestro has been know to extort the workers, demanding part of their wages in exchange for giving them a job. The site engineer or architect will generally not interfere with whatever arrangement exists between the Maestro and workers. In general building, he normally has no direct contact with the workforce, instructions are given through the maestro. On engineering sites, the site engineers have a more direct relation with the skilled workforce, such as machine operators. The major implications of this system are:

b) Informal training, low educational requirements and low wages

Practically all building skills are acquired on site, through informal aprenticeship, or learning from the maestro. The lowest level is that of an "ayudante", a term which is now increasingly replacing the rather denigrating word "peón" or "chalán": the general dogsbody. After acquiring certain skills, he will become a "media cuchara", "oficial" or albañil, with one o several "ayudantes" at his command. Similar hierarchies occur in the specialised building trades. There is no official across the board certification or qualification system. At the same time, building work offers one of the lowest barriers of entry regarding educational requirements, with the exception of certain specialisations, such as electricians and machine operators[8].

The CMIC, by means of its training institute created in 1978 and financed by a 0.2% contribution from its members, does offer a wide variety of training programmes aimed at all levels of the industry, but these

are generally short courses aimed at improving specific skills of experienced workers. Most of the course provide management, information technology and accountancy training to administrative employees (ICIC 2000).

c) Recruitment through intermediaries; no labour contract

Recruitment can occur in a number of ways. The maestro will often bring in friends and relations. He may go to known spots where unemployed building workers offer their services, or to the bus stations to catch incoming immigrants. Workers looking for jobs will also ask around building sites, where they will be directed to the appropriate maestro. In areas where there is a high demand for labour and a lack of local population, labour unions will often act as recruiters, thus controlling access to the jobs[9].

d) Control of labour process through the maestro system

The maestro controls the labour process but, unless he himself is acting as a contractor, sub-contractor or "destajista" (pieceworker), he does not pay the workers. Neither are his wages directly affected by the productivity of his subordinates. Pressure to increase output or improve quality from the site engineers is mediated by the maestros.

e) Labour unions[10]:

Labour unions are important actors in Mexican construction, but their role is not to represent and defend the workers. Within the Mexican corporativist system, these unions belong to the main workers' syndicates which, until recently formed part of the ruling one-party political system[11]. With this backing, the construction unions' prime function has been to extort payment from builders and construction companies on site, in exchange for a red and black notice board displayed in a prominent position, staking one unions' claim against competing organisations[12]. The construction workers are frequently unaware that they are represented by a union. In fact, they often do not know what a trade union is[13].

The labour unions also have played a part in recruiting labour when the traditional channels are insufficient, in large-scale out of town projects, for example, such as the oil development projects in Tampico and Veracruz (Germidis 1974), the Lázaro Cárdenas steel works studied by Hiernaux in the late 1970's (Hiernaux 1983) and a subway station under construction in Mexico City in 1988 (Campos and del Río 1989, p.28). In all these cases, affiliation to the union is a condition of entry for potential workers, thus controlling their mobility and, thus, their bargaining power. The role and relative strength of construction unions varies in different parts of the country. They are particularly strong precisely in those relatively underpopulated areas, such as the oil regions, where there have been massive building programmes. The contractor, or even PEMEX itself, signs an agreement with a particular union, or amalgam of unions, who will then control recruitment. (But see below: in Ciudad Madero, the importation of Asian labour is undermining this process).

This rather negative role of the unions in the Mexican construction industry has been occasionally punctuated by a few brighter moments such as the steel welders' movement and the efforts of unions affiliated to the independent organisation "Frente Auténtico del Trabajo" (Zavala, 1982 p. 228).

The general weakening of labour's bargaining power during the crisis year of the 1980's certainly did not have a positive effect on Mexican unionism, in general[14].

It remains to be seen how the subsequent drastic weakening of the party which has ruled Mexico for six decades, including the loss of clout of its octogenarian union leaders, leading to its reduction of power at Presidential, congressional and many local government levels, will effect the way unions operate at building sites. This is an area where further research is necessary.

f) Labour conditions:

Not surprisingly, construction workers' labour conditions are bad. Employment is temporary; minimum wages are usually paid, though often for a 12 hour working day. Accidents are frequent, as reported by Social Security data, although health conditions are very badly documented (see Part 5).

g) Women[15]

Perhaps the only consolation for the underpaid and overworked "peón" is the fact that the women working on the site are worse off than he is. Between 2% and 3% of construction workers are women[16], some of whom who are hired on site to do the cleaning up tasks. This does not mean just sweeping the floor, but removing the mess, often using scrapers, muriatic acid and other toxic substances. Such tasks, especially when they are done by women, are deemed automatically to be unskilled, so they

are paid the minimum wage. The exception is the female overseer, who controls the female labourers and earns more than they do, but less than the maestro, from whom she takes orders. Women on site are generally looked down on by their fellow workers and superiors, and are not infrequently subjected to sexual abuse. For instance, Slim (1984, 155-6) cites cases of female workers being obliged to have sex with the maestro, in order to get the job, as well as giving up one day's wages to him, like all the other "peones" on that site.

Construction in two decades of crisis and restructuring

In the context of the traditional labour conditions which characterise construction in Mexico, this section looks how the sector has developed over the last two decades, as reflected in the performance of the formal contractors. The main objective is to identify those areas which have experienced significant changes and the factors behind these changes.

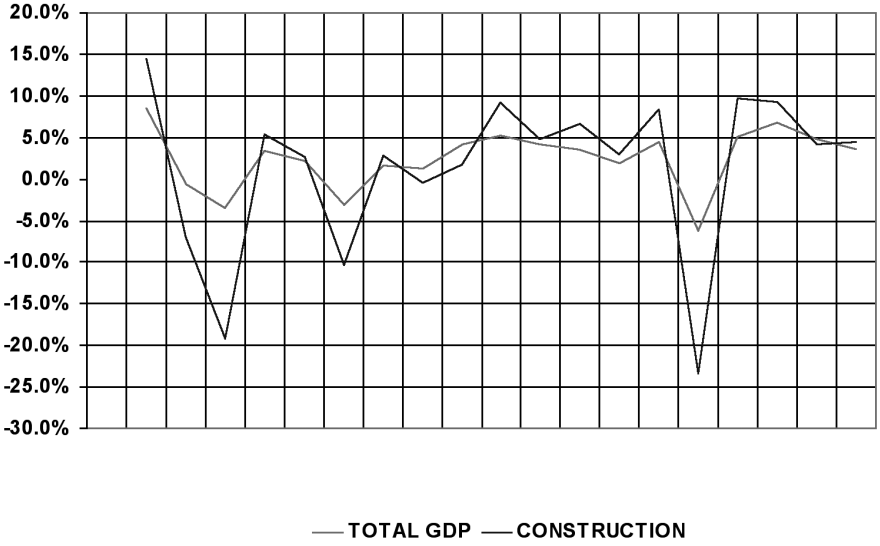
Contribution of Construction Output to the Mexican Economy 1980-2000

Construction output during the two decades, at least in the formal contracting sector, has been drastically affected by two decades of recurrent financial crisis. From Fig. 1, it is clear that the sector is highly sensitive to macroeconomic changes; when total GDP decreases, construction GDP decreases in a greater proportion. Moreover, the overall performance of construction over the two decades has been worse even than that of total GDP, with the result that contribution of construction to total GDP has fallen from nearly 6% in 1980 to 4% in 1999, possibly even less in 2000 (Figs. 2 and 3).

Withdrawal of Government Support for the Construction Industry

Apart from the general immediate impact of financial crisis on the economy as a whole, and therefore, private investment in building, the major reason behind the construction's low output has been the reduction of public investment. The impact of this on the construction industry goes beyond the reduction or reorganisation of investment and affects the whole contracting process. From the nineteen forties onwards, the emergence and consolidation of a national contracting industry happened in the context of State control of major infrastructure development: transport, energy, irrigation schemes and urban services. The major contractors, such as Ingenieros Civiles Asociados (ICA) and Bufete Industrial, grew up depending not only on public investment, per se, but also on the protected contracting environment and favourable relations with the government[17].

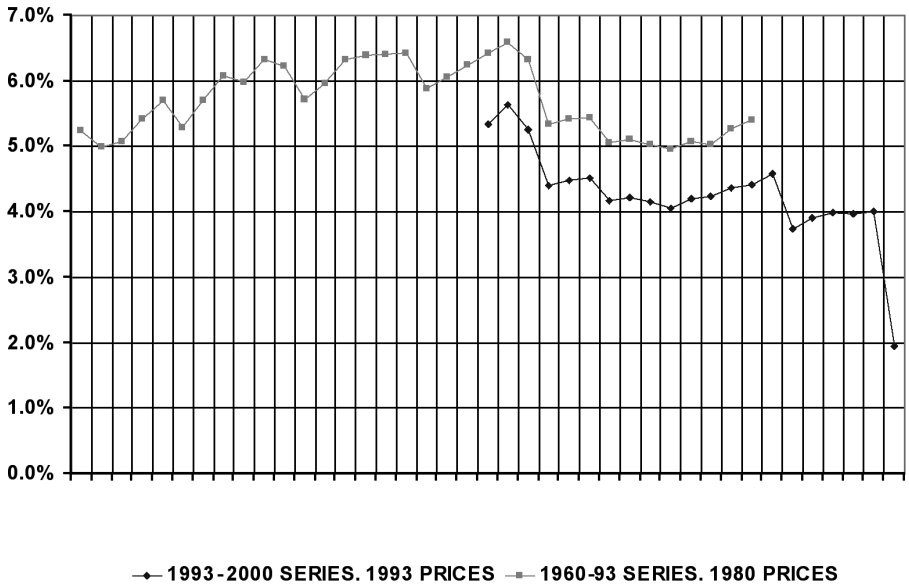
Figure 1



The withdrawal of total government support for the construction industry has taken different forms in different moments. Through the mid nineteen eighties, for example, it was due was due to straight cutbacks, as the possibilities for further foreign public debt vanished, and monetary restrictions were imposed. These reductions were not compensated for by private investment, leading to a general stagnation in construction (Fig.4). During the following period, from 1989 to1993, a different pattern emerged, in which private investment did substitute public sector spending in certain areas previously monopolised by the State, allowing construction to regain some lost ground (Fig.4). This was due to the introduction of franchised public works programmes, as in the case of the toll road construction, water works and, more recently, natural gas, or BOT schemes, for example in the electrical and petrochemical sectors. The steady increase in private sector demand lasted till, precisely 1993, when it slowed down. During1994, just before the bubble burst, construction demand was held up by public sector spending, particularly in electricity and communications infrastructure schemes.

Figure 2

Figure 3



The recession following the financial fiasco of December 1994 affected construction more than any previous crisis; construction GDP was pushed back almost to 1982 levels and has not really recovered since, due primarily to a low level of public investment in infrastructure projects (Fig. 5). After this crisis, the Mexican government has looked to new ways of financing infrastructure in the publicly-owned energy sectors. The most recent formula for financing such projects are the PIDIREGAS schemes (Productive Infrastructure Projects with Deferred Impact on Expenditure in the Public Register) introduced in 1997, whereby the contractor is responsible for financing the scheme until the government can pay back from income it generates. These have been applied by the National Electricity Company (CFE for Comisión Federal de Electricidad) and PEMEX (Petróleos Mexicanos) to increase the electricty generating and refining capacity, respectively (Macroeconomía 2000; Shields 2000c; Entorno Laboral 2001). A major implication of the PIDIREGAS projects, which are tendered internationally, is that they are inevitably won by the firms offering the best terms of finance. Critics have accused the PIDIREGAS of being a disguised form public

Figure 4

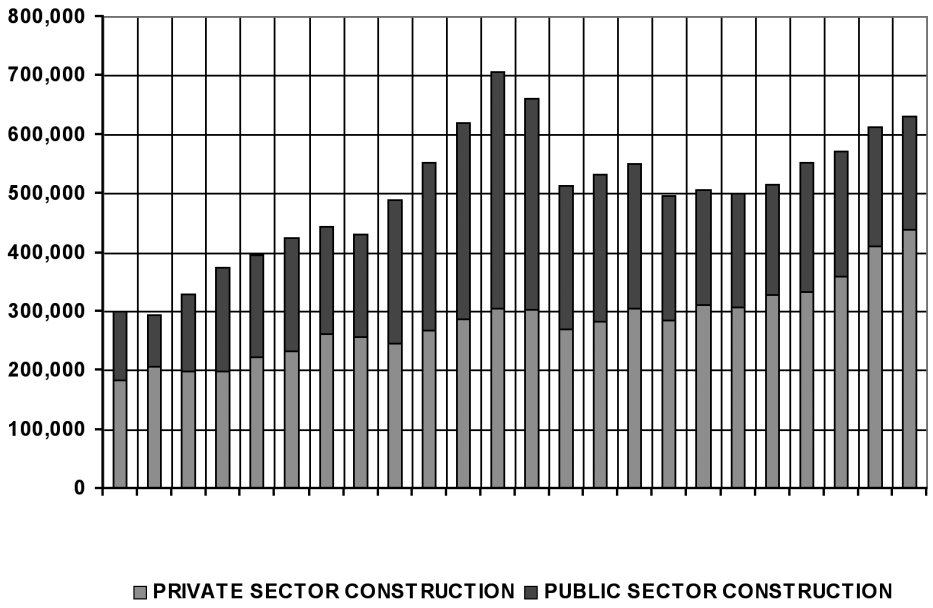
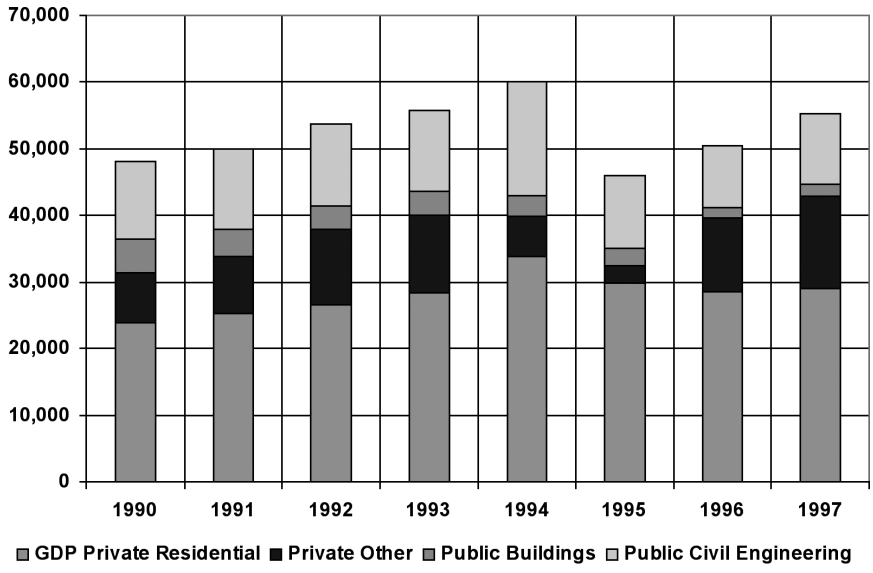


Figure 5



debt not controlled by the Congress, as they do not form part of the national budget (Moreno 2001, Acción 2001a and b). In all events, the government, via the respective descentralised bodies, will sooner or later have to pay for the contracts or sell off assets.

The sorry state of the Mexican contractors can be seen more clearly in the data on output reported by CMIC registered contractors which, as we have seen, is one way of defining "formal sector" construction. It is clear from Fig. 6. that the registered firms were not only more affected by the post 1994 crisis than the construction activity as a whole, but also, unlike construction GDP, they have not recovered from the blow. There are various explanations of this.

First, public spending in heavy engineering projects of all descriptions, on which the large firms have traditionally depended, has not recovered to previous levels.

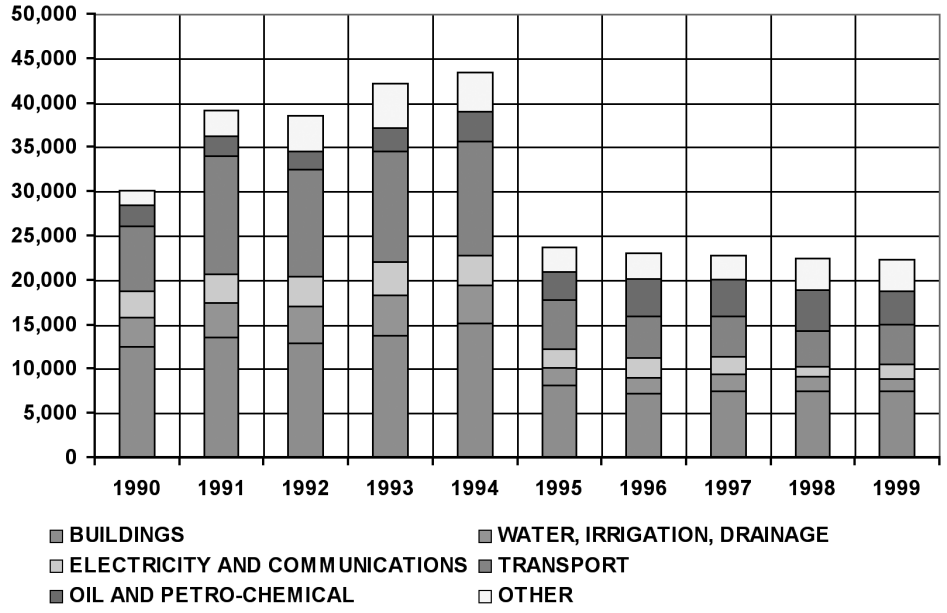
Second, because NAFTA obliges Mexico to open public works projects to foreign tenders, a substantial part of recent public sector contracts are being won by Korean and North American firms, notably in the PIDIREGAS projects for the reconstruction of oil refineries and electricity projects (Coordinación de Economía y Estadística CMIC 1999; Certeza económica, 01/01/1998; Zúñiga, M. 2000). This novel competition is, in fact, one of the major problems facing the national contractors. (See below.). A third reason for the dismal situation of the formal construction sector is the continued recession in most areas of real estate development, including offices, public services buildings, shopping centres and middle income housing. This, in turn, is due probably to the oversupply produced during the first three years of the decade, combined with a scarcity of credit for new ventures.

Increased Informalisation

One effect of the depression is a general tendency of increased informalisation in construction, as reflected the widening gap between the GDP trend, representing the total construction sector, including the important contribution of the self-build housing sector's cement consumption, and the output trend of CMIC registered firms (Fig. 7)[18]. Amongst other things, increased informalisation removes ever increasing numbers of construction workers from their employment, a process already noted in the employment figures.

Most informal construction evidently occurs in residential and non-residential building. From Figure 8, which compares the recent trend of GDP in total and non-

Figure 6



residential building to the output in the same categories, it would appear that informalisation is occurring at a higher rate in the non-residential sectors. Although both housing GDP and CMIC output did decrease drastically 1995, their respective curves follow a similar, rather stable pattern thereafter. This contrasts with the curves for total building GDP and CMIC output in building, which move in opposing directions, suggesting that an increasing proportion of non-residential building is not being produced by formal construction firms, while the latter are moving into housing. This impression is supported by statements from the construction industry that "housing is the strongest sector within the industry" (Robles 2000) and even ICA is looking to housing as a way out of its current problems (Guzmán y Vega 2001).

Figure 7

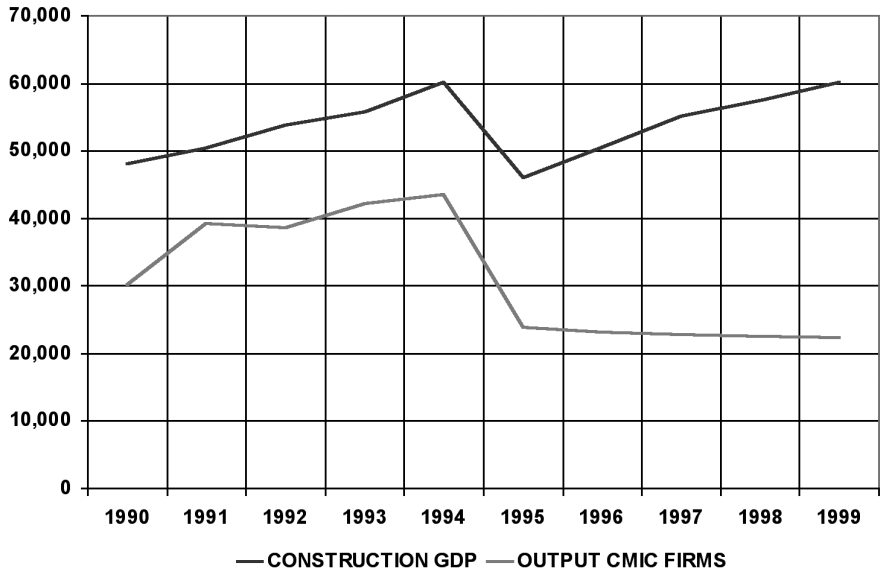
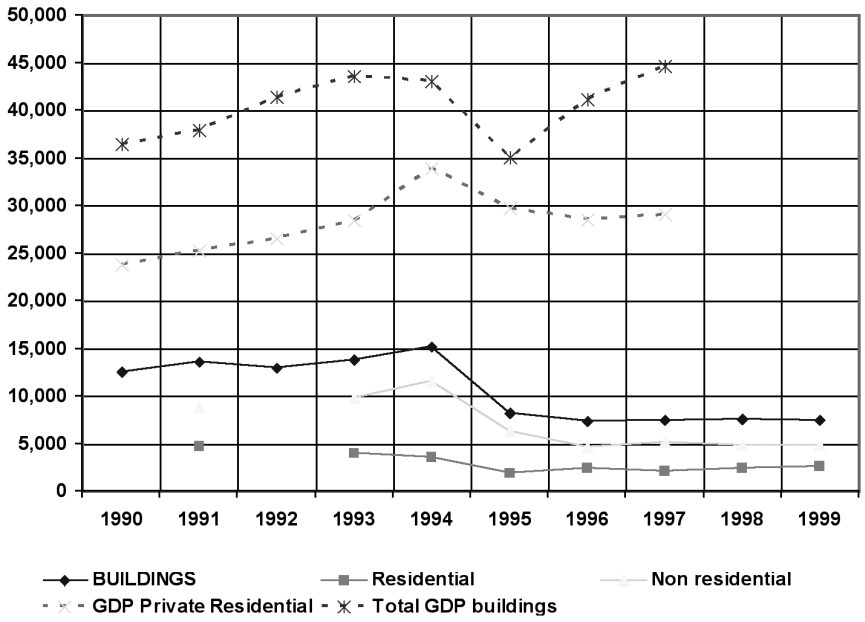


Figure 8



Project implementation

Changes in contract procurement in the public works and civil engineering sectors: the impact of competitive tendering

Since the introduction of contracting as the dominant form of public works provision at the end of the nineteenth century[19], competitive tendering has been the ideal, correspondingly inscribed into the 1917 Constitution[20] and successive legislation on the subject[21]. In practice, however, the norms have not necessarily been respected, and not only because of corruption in high and low places, but also because, in many cases, competitive tendering is not possible or even appropriate. The technical monopoly that ICA, Mexico's leading contractor enjoys in many civil engineering projects, such as tunnelling for the Mexico City's subway and deep drainage systems, has effectively nurtured Mexican expertise in these fields.

Over the last ten or fifteen years, however, legislation and public administration practice has tightened up contracting procedure in the public sector. An important milestone was the 1980 Public Works Law, which replaced the 1967 legislation. Among other innovations, this law provided a more comprehensive set of definitions of "public works", thus eliminating loopholes, for instance, the widely held practice of "administration contracts" for public works: a kind of "labour only contract" disguised as "direct labour", whereby government dependencies could bypass the competitive tendering obligation. It also allowed for lump sum contracts in the public sector and prohibited tenders from firms in which public officials and their relatives up to the fourth degree are involved (Suárez Salazar, 1985). The law and regulations which are derived from it were modified periodically, mostly to keep in step with other changes in public administration.

Through the 1980s and early 1990s this increased regulation of public works contracts does not seemed to have altered drastically the strong relationship between the contracting sector and the government. Still less did it provide a framework for international competition for Mexican contracts. The following are some of the ways and means adopted by government in favour of local contractors: a) until1985, the fiscal system benefited Mexican contractors; b) projects funded with fiscal sources were inevitably granted to Mexican firms; c) contracts that were financed by foreign loans were subdivided so that local firms could tender for them; c) foreign investment in local firms was limited to 49%; d) when the projects were tendered internationally, only local firms had access to all the necessary information and e) the specifications were intentionally vague; f) foreign experts had difficulty entering the country and f) the government aided local firms with insurance and guarantees (Certeza Económica, 1/1/98). As a result, although there were about a dozen or so US firms working in Mexico during the 1980's, most of them did so in association with Mexican contractors, and none were able to establish permanently.

However, following the North American Trade Agreement signed in 1993, construction and especially public works was opened up to international competition, under the category of "services". Public works legislation had to be modified to take account of this and is progressively orientated towards the normative requirements of international tendering. Thus the 1993 Law of Acquisitions and Public Works (Art. 30) states that publicly tendered projects (licitaciones públicas) may be national, when only Mexican companies can tender, or international (LAOP 30-12-93). In previous legislation, international tenders were not mentioned, while all contractors tendering for public works had to be registered in the "contractors' roll": one among many other deterrents for foreign firms venturing to bid for Mexican public works. Even after 1993, internationally tendered projects are only admitted when a) when they are obliged by treaty (such as NAFTA); b) when it is proved that national firms are incapable of realising the contract; c) when there have been no national tenders and d) when it is stipulated for contracts financed by foreign loans to Mexican Federal Government. The 1993 Law, also includes the obligation to employ national human resources in preference over foreign bidders, all other things being equal. This requirement was excluded from the most recent amendment, the Public Works and Services Law, enacted January 4th. 2000 (LOP 4-01-00)[22], which together with the Law of Public Acquisitions (LAP 4-01-00), replaced the previous unified law of Acquisitions and Public Works of December 1993 (LAOP 30-12-93). Amongst other things, The new legislation also regulates in a much more detailed manner the planning, programming, budgeting, contracting, expenditure, execution and control of public works and specifically includes related services[23].

In the definition of "public works" the Law is careful to include those realised by autonomous public bodies, such as universities, while specifically excluding concessioned (franchised) public works and services (Art. 1), but not, it seems, BOT schemes. It also stipulates that the Law is subject (sin prejuicio) the trade agreements (Art. 5).

Regarding public works and services contracts, the Law dictates that these shall be by public tendering, by invitation of at least three prospective contractors or by direct adjudication. These last two forms of contracting are only permitted when public tendering is not feasible, for specified circumstances, ie.: i.) works that can only be executed by a certain person or firm (works of art, patented works, etc.); ii.) emergency situations when "public order" is endangered or as a result of disasters, natural and otherwise; iii.) when additional costs are incurred by public tendering; iv.)for military and naval contracts; v.) when there is no time for tendering an urgently required work; vi.) when a previously tendered contract had to be rescinded; vii.) when the public tender has been declared empty on two occasions; viii.) for the maintenance, restoration, repair or demolition work in which it is impossible to draw up a precise bill of quantities; ix.) where peasant or marginal (sic) urban labour is to be used; x.) when all the work is to be undertaken by a single individual and xi.) when the execution of the work is taken as lieu of payment. (Art. 43). Contracts for less than a determined sum (dictated annually in the public budget) are also exempt from tendering (Art. 44). In other words, in prescribing in detail the kind of situation that previously escaped the public tendering process, this is more effectively enforced as the default way of contracting public works.

Mexican firms can take some comfort from the fact that two of their recent demands have been partially met; the previous article ends with: "the participation of foreign firms may be denied in internationally tendered projects when their country of origin has no treaty and when that country does not give reciprocal treatment to Mexican contractors." It also mentions that publicly tendered projects may specify the incorporation of a determined percentage of Mexican inputs, although this is not obligatory. This is surprising as even NAFTA stipulates that international tenders contain 35% national input (Ortega Pizarro 2000)[24].

The next ten articles of the new Law lay out the procedures for tendering public works and services projects: the specifications, how these should be published, the terms and conditions of the project, when and how the tenders may be opened, criteria for selecting the winner and so forth. This is all much more detailed than in previous legislation, no doubt in response to problems related to the tendering process and complaints from both national and foreign contractors.

In all events, the fact that Mexican contractors are losing out to foreign firms is not primarily due to legal reforms or even NAFTA, but rather, the financial straights of the government and the increasing recurrence to key in hand and externally-financed projects, such as the PIDIREGAS schemes described above. For instance, in spite of the existence of a Mexican consortium Mexpetrol, capable of handling international oil tenders, PEMEX has been obliged to contract North American and Japanese firms for projects financed partially (35%) by EXIMBANK US and Japan (Ortega Pizarro 2000; Carriles 1999).

The big infrastructure projects are increasingly put out to tender as a single package, rather than being broken down into their specialised components. A firm's ability to win the contract depend on its access to credit with which to finance the project, rather than its technical capacity. Here, the Mexican companies are at a disadvantage, due to lack of finance and high interest rates in Mexico. They repeatedly complain of unfair competition from foreign firms, especially Korean and Japanese, who are backed by their respective governments with soft loans and other advantages (Ortega Pizarro 2000). For example, the largest infrastructure project in Mexican History (sic), the Canterell off-shore oil project, worth US $10,500 millions was given to Bechtel in block, who then subcontracted Mexican firms (id.). The Mexican contractors also complain that they do not have sufficient backing to compete, say, in Korea (ASIC, La Jornada 5-1-2000; Carriles 2000), while the tenders put forward but Korean firms are almost at "dumping" prices (id.). The projects referred to are: the reconstruction of the Cadereyta refinery, won by the consortium CONPROCA, led by Sunkyong, in association with Siemens and Tribasa (Kermith Zapata 2000; Shields 2000c) and the the Ciudad madero refinery, won PEMOPRO, a consortium led by Sunkyong and Siemens again. These will be followed by the smaller projects at the Tula and Salamance oil refineries, won by Samsung (Shields 2000c).

As a result of all this, foreign contractors' participation in Mexican construction has grown from practically zero at the beginning of the 1980s to about 42% in 1999 (Ortega Pizarro 2000).

Housing and the Emergence of Integrated Developers

As we have seen, housing is one of the few areas of building which is providing a steady flow of work for construction firms (Figure 8), to the extent that there was an (unsuccessful) move to separate the housing sector from the rest of construction for statistical purposes, and, especially, stock market quotes[25]. By nature, the most informal niche of the industry with up to 70% of all residential building corresponding to informal construction processes, middle to lower middle income house construction is becoming increasingly formalised. This is due to a maintained operation of the housing finance programmes, consisting of payroll funds and federal subsidies. These programmes, set in motion from the nineteen sixties onwards, effectively opened up a middle and lower middle income housing market for contractors, both in high rise and low rise developments. In 1976, changes in the way the payroll funds operated gave rise to a new breed of housing entrepreneurs: the promoters, who tended to operate separately, though often in close association with, the contractors. Further changes in the late 1980's to payroll fund operations, combined with a restructuring of banking legislation prior to the re-privatisation of the banks in 1989 fostered the transformation of the promotores into desarrolladores: a type of firm which combines the functions of a speculative builder and a developer.

The crucial difference between most housing promoters and the new generation of developers is that the latter are usually more directly involved in the construction process. They are not strictly speculative builders, as their market is guaranteed, but they are directly responsible for design, construction and marketing the product, within the constraints laid down by the housing finance organisations. Their direct involvement with the building process varies. The largest housing developer in Mexico (in the world?), Grupo GEO, whose annual turnover is about 130,000 units, has the most integrated approach. Its involvement spans from materials manufacture to marketing and it has developed its own technology in the process, fostering a more permanent relationship with the workforce. GEO has expanded its operations to Chile and the United States, adapting the building techniques to the different relative costs of labour and materials[26].

Structure and ownership of construction firms

This section refers exclusively to what has been defined as "formal sector" construction, that is, those construction enterprises which are affiliated the Mexican Construction Industry Chamber (CMIC). However, it should be remembered that this sector produces perhaps less than a third of the country's total building output and at present employs less than a fifth of all construction workers.

From table 2a and figure 9, the extreme concentration of Mexican construction is evident. The largest 200 or 300 firms, representing between 1% and 2% of the total number, are responsible for between half and two-third total formal output. At the other extreme, around 95% of the smallest firms account for only a quarter of total output. In fact, over 90% of all firms are really small, with average annual output of less than 200 thousand US dollars a year, compared to an average over 40 million dollars handled by the group of the largest firms (Table 2b).

This extraordinarily flat-based pyramidal structure of the contemporary Mexican construction industry has not changed very much over half a century[27], although the concentration of output does seem to become more extreme towards the end of the 1990s, in spite of the trials and tribulations faced by the giant civil engineering firms in recent years. For instance ICA has cut its labour force from 42 thousand to 19 thousand, its shares dropped from 30 to 4 dollars on Wall Street and it had to sell off some major assets such as shares in railways, hotels, electricty and transport (Ortega Pizarro 2000). Bufete Industrial, has reduced its payroll from over 3000 to just a few hundred and is now in the hands of its creditors, mainly Citybank (Carriles 2000). The other giants, Protexa, Tribasa, Grupo Mexicano de Desarrollo all present similar sad stories. But their stories at least make the business press, even mainline news, while the quite disappearance of the smaller companies goes unrecorded, except as an

unfortunate statistic: the 21,248 firms that disappeared between 1994 and 1999 (table 2b).

The above figures do not include foreign firms, which have become more prominent, especially since the appearance of Korean and Japanese contractors. It is difficult to obtain precise data on these firms as, being contractors, they do not necessarily figure in data on foreign investment. However, there is foreign investment in construction in Mexico, though this less than 0.9% to total foreign direct investment. The distribution of this by type of building and country of origin is shown in annexed[28] pdf file, which shows the increasing importance of housing as the major attraction of foreign firms in this sector (118 a total of 463 firms in 2000 and 10% of total investment from 1994-2000) while industrial buildings attract more capital (55 firms but 31% of the investment). US firms dominate by number (234 of the 463 registered in 2000) and by capital (72.5% of investment between 1994 and 2000) having replaced the previous domination of French investment in Mexican construction (Coordinación de Economía 1999 and SECOFI 2001).

Table 2a
Mexico: number of firms affiliated to the Mexican Construction Industry Chamber 1990-1999

	Total	Giant	%	Large	%	Medium	%	Small	%	Micro*	%
1990	15,982	135	0.8%	202	1.3%	1,123	7.0%	14,522	90.9%	n.d	n.d
1991	18,006	313	1.7%	508	2.8%	2,760	15.3%	14,425	80.1%	n.d	n.d
1992	18,049	299	1.7%	614	3.4%	2,609	14.5%	14,527	80.5%	n.d	n.d
1993	16,829	349	2.1%	261	1.6%	1,011	6.0%	15,208	90.4%	n.d	n.d
1994	16,204	378	2.3%	496	3.1%	868	5.4%	14,462	89.2%	n.d	n.d
1995	15,313	444	2.9%	408	2.7%	944	6.2%	1,188	7.8%	12,329	80.5%
1996	15,705	392	2.5%	466	3.0%	437	2.8%	730	4.6%	13,680	87.1%
1997	13,995	264	1.9%	256	1.8%	422	3.0%	1,145	8.2%	11,908	85.1%
1998	10,572	239	2.3%	222	2.1%	383	3.6%	667	6.3%	9,061	85.7%
1999	9,369	123	1.3%	119	1.3%	270	2.9%	315	3.4%	8,542	91.2%

* 1990-1994: included in "Small"

Table 2b
Mexico: output of firms affiliated to the Mexican Construction Industry Chamber by size of firm 1990-1999
(millions of 1993 pesos)

	Total	Giant	%	Large	%	Medium	%	Small	%	Micro*	%
1990	24,521	7,011	28.6%	4,097	16.7%	3,673	15.0%	9,740	39.7%	n.d	n.d
1991	28,213	12,927	45.8%	4,040	14.3%	5,950	21.1%	5,296	18.8%	n.d	n.d
1992	36,090	20,066	55.6%	1,552	4.3%	2,959	8.2%	11,513	31.9%	n.d	n.d
1993	42,180	24,043	57.0%	2,581	6.1%	3,834	9.1%	11,722	27.8%	n.d	n.d
1994	47,896	29,015	60.6%	2,922	6.1%	3,880	8.1%	12,079	25.2%	n.d	n.d
1995	25,753	15,583	60.5%	1,901	7.4%	1,756	6.8%	979	3.8%	5,535	21.5%
1996	24,667	15,207	61.7%	1,516	6.1%	1,683	6.8%	1,084	4.4%	5,177	21.0%
1997	25,560	14,983	58.6%	1,832	7.2%	1,392	5.4%	1,001	3.9%	6,352	24.8%
1998	26,579	15,271	57.5%	1,678	6.3%	1,765	6.6%	1,499	5.6%	6,367	24.0%
1999	26,648	16,714	62.7%	1,697	6.4%	1,633	6.1%	922	3.5%	5,682	21.3%

1990-1994: included in "Small"
Source: Cámara Mexicana de la Industria de la Construcción 2000.

Employment, training and skill requirements

Impact of restructuring on employment and labour conditions

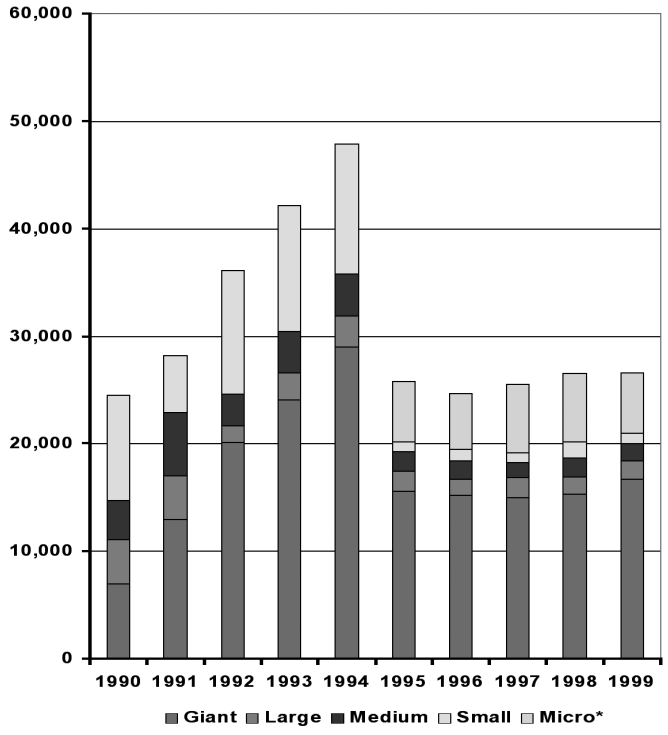
The general panorama concerning recent changes in construction employment has already been dealt with in part 2 and may be summarised as follows:

- There is a drastic informalisation of construction in Mexico which is manifest both in statistics on performance of the industry and employment.
- The major cause of this is the loss of work by the formally constituted and registered CMIC companies, particularly the largest ones, who were drastically affected by the 1995 crisis and have not recovered since, having lost their traditional niche in the public works investment market to foreign competitors. The workforce of CMIC employees in 1999 represented only 13% of total employment in construction, compared to 26% in 1993 (table 1): equivalent to an absolute loss of 212,400 employed (almost half those registered in 1993).
- The lack of work in CMIC-registered companies is the principal explanation of the reduction in the proportion of those employed in construction who have social security coverage, which fell from 58% to 40% between 1993 and 1999.

The precarious economic situation of the largest companies has combined with the effect of political reform to generally undermine the relative strength of the Construction Chamber itself: for obvious reasons previously a stronghold PRI supporters, whose directives routinely occupied the government positions responsible for public investment programmes. One effect of this has been to reduce the scope and effort of the CMIC training programme aimed at raising productivity and improving labour conditions within the industry.

For similar political reasons, the construction unions, all affiliated to the PRI, are also in a weaker position. At any rate, their role has been primarily limited to negotiating general wage levels, within the sector, in a particular region or with a particular contractor, rather than defending jobs or improving labour conditions[29].

Figure 9



In a context in which the average real industrial wage is decreasing, construction wages are amongst the lowest, although they do not seem to be decreasing at a faster rate than other economic sectors. This might be surprising given the slump in demand for labour, but is explained by the fact that the basic construction wage is tied to the minimum wage, which is negotiated politically, rather than determined by the market forces. Important regional and sectorial wage differentials do exist, especially for skilled and semi-skilled work, but their quantification is beyond the scope of this paper. The following table, gives some idea of the variation of average wage levels by size of firm for 1998 and 1999.

Real wages in the informal employment conditions are, by definition, difficult to ascertain[30]. At present (May 2001), in Mexico City, an unskilled construction worker earns about the minimum wage (about US $260 a week) while a skilled maestro can earn three or four times as much. The working day is from 10 to 12 hours, with a short break for a meal. There is no job security beyond the week they are hired for. Their social security coverage insures their employee against the medical cost of accident, but does not provide other more long-term medical or unemployment to the workers or their families.

If the reduction of formal construction by national companies and the informalisation of total construction output is probably the major factor behind the informalisation of employment, there are other contingent hypothesis to be explored:

a) A possible increase in productivity in certain sectors, leading to layoffs of construction workers and their subsequent refuge in the "self build" sector.

Unfortunately, data on employment by CMIC firms for different types of building is not available, while aggregate and average productivity estimates are meaningless. Further research into this question is beyond the scope of this paper.

b) It has been suggested that informalisation is associated with increased subcontracting.

This is difficult to prove as practice varies among types of building, among regions and between individual contractors. Subcontracting is routine for specialised work which the main contractor cannot handle. Multi-tiered subcontracting of unskilled tasks, such as pick and shovel work, is commonly observed in public works projects. On other hand, evidence from two types of building strongly affected by recent economic re-structuring provide contrasting tendencies, even within the same subsectors.

Impact of free trade on employment conditions in the industrial and oil sectors

The substitution of Mexican contractors by North American, Japanese and Korean firms contractors in the reconstruction of oil refineries and petrochemical plants, and in electricity generating the energy is producing two kinds of effects on labour conditions. First the national firms participate as minor partners, which means that

Table 3
Average monthly remuneration per employee of the cmic registered firms. Annual mean 1998-1999 (current pesos)

	1998			1999		
Size of firm	Total	Permanent Employees	Temporary workers	Total	Permanent Employees	Temporary workers
Total	$2,221	$3,541	$2,009	$2,638	$4,096	$2,400
Giant	$2,929	$6,247	$2,786	$3,380	$6,962	$3,325
Large	$2,106	$3,960	$2,024	$2,410	$4,159	$2,393
Medium	$1,862	$3,190	$1,805	$2,314	$3,625	$2,184
Small	$1,860	$2,618	$1,809	$2,101	$3.013	$2,023
Micro	$1,767	$2,408	$1,679	$2,023	$2,620	$1,900

Note: The peso oscillated between 9 and 10 to the dollar throughout the two years, although there was about a 10% inflation rate here.
Source: adapted from CMIC (2000) Situación de la Industria de la Construcción 2000, p.92.

they are virtually subcontractors ("pieceworkers", as Jaime Hernández Balboa, vicepresident of Bufete Industrial put it[31]). In Cadeyreta, the Korean-led Conproco subcontracted 284 firms, many of handling several contracts under adverse circumstances (Shields 2001c). One leader of the Tampico construction industry is also quoted in another article as having been unable to come to an agreement with Pemopro about the mandatory subcontracts with Mexican firms. Meanwhile, "39 firms have been detected, which are really subsidiaries of the Korean company, acting as simulated Mexican subcontractors" (Hernández 2001a). I have not been able to acertain to what extent this affects traditional subcontracting procedures and labour relations. However, it is clear from the vociferous complaints of the firms concerned, this tendency has provoked high unemployment across the sector. But this has different implications, depending on the stratum of the workforce.

The construction workers, most of whom are casually employed and informally trained slip back into informal construction, into agriculture, and or migrate to the more prosperous parts of Mexico or across the border, always ready to return to formal construction work as the need arises. At the skilled labour and engineering spectrum of the labour market, the effects of the recent recession may be more permanent. As one source puts it (a leading representative from one of the most affected Mexican contractors): "during the mid 1970s, PEMEX disposed of almost 20 millions of men/hours, … with almost 8,000 engineers and technicians… In those days Tula, Cadereyta and Salina Cruz refineries were built, in which the participation of goods and services of Mexican origin was over 85%. Now there are only a little more than 3 millions of men/hours in engineering for public and private industrial projects. The knowledge and technological pride has been lost" (Shields 1999).

The other side of the picture is what is happening on the electricity generating and refinery sites in the hands of the US, Japanese and Korean contractors. There is very little information about this, but evidence from a recent articles in Proceso[32] not only depicts a rather sinister future for Mexican infrastructure projects but also suggests that further research on the subject may prove to be extremely difficult. The articles denounce, respectively, the labour conditions and corruption in the importation of Koreans, Chinese and Philippine immigrant workers working in a Taiwanese textile maquiladora (bonded industry plant) in Ciudad Victoria, Tamaulipas and in the reconstruction of the oil refinery in Ciudad Madero by a Korean contractor (Sunkyong), in the same State. Here are some of the findings of the articles.

An interview with a Chinese worker on the textile plant revealed that he had been recruited in Beijing, trained in Taiwan and began to work in Nicaragua. He has been working for more than a year at the Ciudad Victoria Nien Hsing factory, where "hundreds of Chinese men and women work, together with Mexicans. under the orders of Taiwanese". According to one of the Mexicans "The Taiwanese are the bosses and the Chinese are the workers, like us. but they are paid in dollars, they have free transport and meals, although they work seven days a week, they have no medical or social security coverage and practically live in concentration camps". They live in a walled in and guarded housing project built expressly to house them on the outskirts of the city, where they have little contact with the outside world; only a few manage to learn Spanish and some have married locals. The Mexicans complain or ill treatment from the Taiwanese, including physical abuse, low payment and long hours (12 hours a day, five days a week). In 1997, some 30 Mexican recruits were sent to Taiwan for three months' training, where they had to work over 12 hours a day and were kept in dirty, overcrowded conditions. Clearly the Mexicans are not up to the Chinese militarised high productivity routines!

The reporter considers that "for the Thai and Phillipine workers that have come to Ciudad Madero to work on the reconstruction of the oil refinery life is much the same as for the Chinese". In the nearby encampment there is no more room for these workers, so the firm has rented various houses which they have converted to house 30 to 50 workers each ("The living rooms, for example, have been converted into collective showers"). The technicians and overseers are Korean. "They live in hotels and houses they have rented in residential neighbourhoods, where they throw parties and are frequently seen in discotecs and on the beach." The Koreans with dollars pushing prices up and attracting the local girls definitely do not seem to be welcome newcomers to the Tampico area where Ciudad Madero's is located.

The following article reports on demonstrations by the workers affiliated to the union of construction workers (Sindicato de Trabajadores de la Construcción,

Excavaciones, Conexos y Similares) which supposed holds the labour contract with Pemopro, the consortium led by Sunkyong, in charge of the project. A union representative complains that every morning, the Asian workers "appear" on the works, thus displacing the Mexican workers.

The rest of the article peruses the evidence of corruption amongst the inmigration officials. On this point, a number of convincing accusations are mentioned, such as the Asians' tourist visas being substituted for work permits at US $1,000 a piece, but the accusations are obviously difficult to prove.

I would not believe everything that is published in Proceso, a leftish weekly specialised in unearthing scandal, but the article referred to certainly does raise a serious concern about the impact of foreign contractors on construction employment in Mexico. In particular, the combination of Asian style labour relations with the traditional exploitation of the Mexican construction worker, could lead to a substantial worsening of conditions, from the point of view of both Mexican and Asian workers.

Employment on the housing sites

As we have seen, housing is seen as the Mexican construction industry's brightest hope for the near future. A major question is, then, to what extent the new housing developers are changing the traditional, highly exploitative and informal, employment relations. Although the subject needs much more direct research, both on site and by interviews, the evidence gathered so far suggests that there is no general tendency here, but that different developers are adopting different labour strategies, along with technology and regional differentation.

Most of the housing developers are responsible in varying degrees for the building process and, therefore, directly hire labour. Perhaps the extreme case is GEO, with its integrated production process, on and off site industrialisation of component production and giant scale of operations, all of which require new kinds of relationships with the labour force, including the defragmentation of the building process, generally. Other developers do not seem to have changed the basic premises governing recruitment and labour conditions. For example, comments from a previous employee of ARA, one of the major developers, suggest that wages there are better than in traditional construction, but work is harder, requiring longer commitments as temporary migrants to distant sites [33]. However, the situation regarding technological innovations and the organisation of labour seems vary among the different developers. The North American company, Pulte, which has been active in the Mexican housing development industry since 1994, with a turnover of around 7,000 houses in 1999, does not build directly, but subcontracts Mexican firms[34]. Further research is needed to evaluate the impact of these new housing developers on (among other things) labour conditions in construction.

Notes

1. See Araud, Boon et. al. (1975), Germidis (1972 and 1974), Mertens (1982a and 1982b).
2. COPEVI (1977), Ball and Connolly (1987), Connolly (1986, 1988 and 1989), Fidel (1974), Fidel and Ziccardi (1986), Ziccardi (1991).
3. The most useful of the un-published thesis include: Munguía (1982), Slim (1984), Sánchez (1986), Cornejo (1986), Campos y del Río (1989), Soto y Castro (1991). See also: Jacobs (1983), Hiernaux (1983)
4. For a good comparison of previous ENE and census results on EAP, see Jusidman, C. and Eternod, M (1995) La Participación de la Población en la Actividad Económica en México, México, INEGI/IIS-UNAM, pp.5-30
5. It is unlike that any construction firm of whatever size would have all their employees in the social security system: it is too expensive, the workers come and go weekly and do not generally use it (for accidents its usually possible to get them covered post hoc.) What happens is that the contractor or architect or engineer will have a token amount of their workforce, the more permanently employed, or those workers who expressly ask for Social Security coverage, and a few "empty" contributions to cover accidents.

6. As far as I know, there have been no in-depth studies of employment histories of individual construction workers. Most of the surveys are transversal. However, conversations with maestros y ayudantes confirm the impression of work experience with a variety of types of employer. Also the recruiting system and the casual nature of employment in building presupposes a highly mobile labour force. For example, we are currently employing three construction workers to do some minor improvements to our recently acquired house. They are all from a rural indigenous Mazahua community about 100 km. away and go back every weekend. The most senior, who has now achieved the status of "maestro" passes on the orders to the other two, as well as the Saturday pay packet; and if you do not respect this hierarchy there is trouble! Another one has would have the status of "semi skilled" or "oficial". He is certainly a skilled bricklayer, can lay shuttering, mix and pour concrete, plaster, take levels, etc. etc. His work on this kind of job alternates with employment with one of the major housing developers (Ara) where he is paid twice as much, but has to work harder and is sent to distant sites such as the massive housing schemes in the blistering heat of Sinaloa and Tijuana.

7. See sections 2 and 5 of the bibliography.

8. These comments on informal training are based on surveys conducted in the 1980's by Cornejo, Ma. T., 1986, Sánchez 1986, p. 44 and confirmed by recent interviews. See also the interview with a maestro reported in 1998 by Alvarez in Certeza Económica, which stresses the importance of family ties in the informal traing process.

9. Germidis (1972), Cornejo (1986), Sánchez (1986), confirmed by recent interviews with arquitect builders and informal observations of recruiting process.

10. The most far-reaching study of the role of trade unions in the construction industry was undertaken by Germidis (1974), whose findings were largely corroborated by they above mentioned surveys of building sites in the Mexico City area in the mid 1980's and reconfirmed in recent interviews.

11. Cockcroft (1983, 154-157, 221-225, provides an uncompromising account of the Mexican trades unions and their relationship to the corporativist state. Riding (1986, 119-124), from a journalistic perspective, also describes the pyramidal structure of the corporitivist "charrist" unions which have dominated labour relations in the country during the second half of the twentieth century.

12. All interviewees confirm this account, as do many anecdotal reports from friends and acquaintances who have built their own houses. Riding (1986, 122) puts it this way: "The construction industry, for example, has over a hundred different unions, all of them vehicles for the racketeering of individual bosses" (but, I would add, ultimately affiliated to the major corporativist workers, peasants or popular organisations).

13. This is reported in surveys carried out in the 1980's by Slim (1984), Sánchez (1986), Cornejo (1986) and Soto and Castro (1991).

14. Zapata (1994) shows how the Mexican predominantly corporativist unions were incapable of defending their members' agains the successive onslaughts of lay-offs, wage cuts and other flexibilisation measures, except in a few crucial "trade offs" such as the conservation of the social security system.

15. There are few studies on women in construction work. The above comments are based on Soto and Castro (1991).

16. 2.8% of population employed in construction were female, according to the National Empoyment Survey (ENE 1995).

17. The payment of graft by construction companies to public officials is widely recognised, though, not surprisingly, difficult to prove. Comments from friends and acquaintances on both sides, that is independent contractors tendering for government jobs, and public employees in construction and maintenance departments, confirm that this practice is far from extinguished. Morris (1992, 69, 73-4) cites newspaper reports and other sources on violations of tendering processes in local government contracts and unexplained expenditure in this field. The distortion of the tendering process in itself allows for monopoly prices, but there are, or have been until recently, genuine technical monopolies exercised by the top contractors with their unique technical and financial capabilities, especially in ambitious civil engineering projects. Advance payments of between 15 and 25% of the contract's value is standard practice in construction (also in consultancy work!).

18. As one analyst observes: "Cement production is a key indicator of that construction has grown, but at present, its expansion has not been accompanied by an improvement in the situation construction companies. The explaination is simple, the formal sector is in a state of impasse (sic),, while other types of construction such as self build and small works which consume cement have been supported on a large scale, without any repercussion at a macro economic level". (Quoted in Robles 2000).

19. On the origins of contracting in Mexico and the role of S. Pearson & Son, see Connolly (1997 and 2000).

20. Article 134, which has remained unamended since its enaction in 1917 states: "All contracts which the government has to realise for the execution of public works, will be adjudicated in auction, by convoking the presentation of proposals in sealed envelopes, which will be opened in public".

21. The first "Law for inspecting public works contracts was enacted on January 4th. 1966". This was complemented by various regulations 1967 and 1970 (Suárez Salazar 1985).

22. Diario Oficial Martes 4 de enero de 2000.

23. This is acertained from the correspondence on the subject between the Construction Industry Chamber, who claim the Build-Operate-Transfer schemes are not concessioned public works, and the Secretaría de Contraloría, who claims they are (correspondence reproduced in Carpyntero s/d, p. 27-31).

24. The initial cuota was 50%, which would decrease gradually to zero after ten years from 1993 (Certeza Económica 01-01-98).

25. The optimism regarding the low and middle income formal housing sector, after the 1995 fiasco is reflected in a number of articles, such as Levin (2000a and b) which suggest that shares in either of the three leading housing devlopers is a good investment.

26. García Corona, Carlos (Vicepresidente de Diseño y Vivienda Grupo GEO) "México como exportador de vivienda" paper presented at the seminar "Apertura Comercial, Cambios en la Política Social y su Impacto en el Sector Habitacional" El Colegio de México 3 de diciembre de1999. The figures quoted in this paper regarding the relative costs of labour are indicative of the conditions of construction workers in Mexico. Here, the ratio of labour to material costs is 20% to 80%, compared to 40% to 60% in Chile and 70% to 30% in the United States.

27. In 1950, 3% of firms produced 41% of output and in 1979 1% of firms produced 43% of output (Ball & Connolly 1987).

28. IED2000 const.pdf (http://www.economia-snci.gob.mx/Inversi_n/Estad_sticas/cons.pdf). I have not been able to convert this to excel, but thought it was worth sending anyway.

29. General wage levels and increases are still negociated between the union leader and the CMIC for particular projects in certain areas. For example, 10 unions have just pacted a 9% rise for the portfolio of projects in the Altamira (Tampico) area this year (Entorno Laboral, 26-03-01).

30. If there is interest in this, I could analise the breakdown of the employment survey, although this is a rather laborious process. The general tendency is loss of real wages throughout the economy.

31. Cited in Shields (1999, 2).

32. The following paragraphs are taken from Hernández (2001a and 2001b).

33. Testimony of Carlos, a skilled bricklayer from the rural ethnic Mazahua region of Mexico State, who alternates working for firms like the housing developer Ara with casual work in the traditional sector; in this case it was his kinsmen, a quasi maestro, also Mazahua, who brought him along to work on some house repairs for us.

34. Naves Ramos, Vicente, General Director of Pulte International Mexico Inc. "La experiencia de empresario norteamerciano", paper presented at the seminar "Apertura Comercial, Cambios en la Política Social y su Impacto en el Sector Habitacional" El Colegio de México 3 de diciembre de1999.

Sources

Published studies

Araud, C. et al. (1970) La construcción de vivienda y el empleo en México, El Colegio de México.

Cockroft, J. (1983) Mexico. Class Formation. Capital Accumulation and the State, New York, Monthly Review Press.

COPEVI (1977) El capital en la producción de vivienda, Centro Operacional de Vivienda y Poblamiento, México, DF.

Germidis, D. (1972) The Construction Industry in Mexico, Development Centre OECD, París.

Germidis, D. (1974) El trabajo y las relaciones laborales en la industria de la construcción, El Colegio de México.

Hiernaux, D. (1983) Los trabajadores de la construcción en la Ciudad Lázaro Cárdenas, Documento de Investigación, no. 7, Centro de Investigaciones y Documentación de América Latina (CREDAL), París.

Morris, S. (1992) Corrupción y Política en el México Contemporáneo, México, Siglo XXI (first edition in English: 1991, Corruption and Politics in Contemporary Mexico, University of Alabama Press.

Pujalte, A. (1997) La Infracultura en la Construcción, México DF, Private edition.

Riding, A. (1986) Distant Neighbors, New York, Vintage Books Edition.

Suárez, C. (1985) Legislación Comparada de Obra Pública, México DF, Ediciones LIMUSA.

Zapata, F. (1994) "Sindicalismo y proyecto económico", en E. de la Garza (coord.) Democracia y Política Económica Alternativa, México, La Jornada Ediciones.

Zavala, I. (1982) "Sindicalismo, la estructura desgarrada", in El Desafío Mexicano, México. Ediciones Océano.

Ziccardi, A. (1991) Las Obras Públicas de la Ciudad de México (1976-1982). Política Urbana e Industria de la Construcción, México, UNAM.

Unpublished studies and reports

Jacobs, M. (1983) Campesinos y la industria de la construcción en Tabasco 2000, Universidad Autónoma Metrpolitana, Xochimilco, (mimeo).

Mertens, L. (1982a) Algunas tendencias actuales en el mercado de trabajo de la construcción en México, Programa de Planificación y Políticas del Empleo, PNUD-OIT, México, (mimeo).

Mertens, L. (1982b) El mercado de trabajo de la construcción en México y la recesión actual, Ponencia presentada para la 1ª, Reunión Interamericana de Capacitación en la Industria de la Construcción, octubre, México, (mimeo).

Fidel, C.; García, B.; Godínez, A. (1984) Relaciones laborales en el complejo de la construcción, Universidad Autónoma Metropolitana-Azcapotzalco, (mimeo).

Articles published in academic journals

Ball, M. and Connolly, P. (1987) "Capital accumulation in the Mexican construction industry 1930-82", International Journal of Urban and Regional Research, vol. 11, no.2.

Connolly, P. (1988) "La industria de la construcción y relaciones de trabajo en la producción habitacional", en Procesos Habitacionales en la Ciudad de México, Secretaría de Desarrollo Urbano y Ecología/Universidad Autónoma Metropolitana, México D.F. pp.183-219.

Connolly, P. (1988) "Productividad y procesos laborales en la industria de la construcción mexicana", Revista Vivienda INFONAVIT, vol.13, no.1 enero/junio pp. 2-99.

Connolly, P. (1989) "The Mexican construction industry", Proceedings of the Bartlett International Summer School vol. 10, London, pp.192-201.

Articles published in business literature and National Press

Álvarez, E. (1998) "Albañil, ¿el eslabón más débil o más fuerte de la cadena constructora?" Certeza Económica, 01/01/98 México, D. F. (Cortesía: INFOLATINA).

Beteta, I. (2001) "Industria de la Construcción. Lenta recuperación", Siempre, 28-02-00, (Cortesía: INFOLATINA).

Coordinación de Economía y Estadística CMIC (1999) "La participación extranjera en el mercado nacional de la construcción", Revista Mexicana de la Construcción, No. 534, pp. 40-42.

Coordinación de Economía y Estadística CMIC (1999) "El empleo y la capacitiación en la industria de la construcción", Revista Mexicana de la Construcción, No. 538, pp. 47-48.

Carriles, L. (2000) "Drástica reconversión de constructoras", Petróleo y Electricidad, 1-03-2000, (Cortesía INFOLATINA).

Carriles, L. (2000) "Constructoras Niponas desplazan a las nacionales" Certeza Económica, 1-05-00 (Cortesía INFOLATINA).

Coordinación de Economía y Estadística CMIC (1999) "La partipación extranjera en el mercado nacional de la construcción", Revista Mexicana de la Construcción, no. 534, agosto 1999, 00. 50-42.

Hernández, G. (2001) "Aventuas de chinos y taiwaneses en Tamaulipas", Proceso, 13-05-01, pp. 34-5.

Hernández, G. (2001) "Corrupción en la importación de trabajadores asiáticos", Proceso, 13 de mayo 2001, p. 36.

Instituto de Capacitación de la Industria de la Construcción (1999) "¡Tu competencia ya lo está haciendo!", Revista Mexicana de la Construcción, No. 538, pp. 12-14, diciembre.

Kermith, J. (2000) "Negro panorama constructoras" Servicio Universal de Noticias, 27-01-00, (Cortesía: INFOLATINA).

Levin, B. (2000ª) "Building Boom" Business Mexico, 1-11-00 (Cortesía INFOLATINA).

Levin, B. (2000b) "Vivienda: el sector pujante de la construcción" El Nuevo Inversionista, 1-12-00 (Cortesía INFOLATINA).

Mercamétrica (1992) "Manual Económico de la Industria de la Construcción", México.

Orozco, V. (2000) "En riesgo, 42 mil familias de trabajadores de la construcción. Gigantes del ramo, los más golpeados" Petróleo y Electricidad, 1-06-00 (Cortesía INFOLATINA).

Ortega, F. (2000) "Las grandes constructoras, frente a la competencia extranjera". Proceso, 5-03-00 (Cortesía: INFOLATINA).

Pineda, M. (1998) "Del desastre a la recuperación", Certeza Económica, 01/01/98 (Cortesía INFOLATINA).

Robles, A. (2000) "Aplazado despegue de la construcción", El Universal, 22-11-00 (cortesía INFOLATINA).

Shields, D. (1999a) "Frente a la apertura salvaje", Siempre, 7-10-00 (Cortesía: INFOLATINA).

Shields, D. (1999b) "Ante la invasión coreana", Siempre, 18-11-99 (Cortesía: INFOLATINA).

Shields, D. (2000) "Pemex.Refinación, cadeyreta: una babel petrolera", Expansión, 27-9-00 (Cortesía INFOLATINA).

Zúñiga, M. (2000) "Contra el favoritismo. Constructores mexicanos se quejan de que en los grandes contratos de obra pública se da prioridad a las empresas extranjeras" Reforma, 18/12/00, p. 21A.

"Antes de que el futuro nos alcance", Certeza Económica, 01/01/98 México D.F. (Cortesía: INFOLATINA).

"CFE refuerza su financiamiento con PIDIREGAS" Macroeconomía, 15-12-00 (Cortesía INFOLATINA).

"Corporación GEO firma alianza estratégica con mutus.com", Corporación GEO, S.A. de C.V., 4-09-00.

"Desde los ochenta se colapsó el sector", Certeza Económica 01/01/1998 (Cortesía: INFOLATINA).

"Enclenques en la globalización": Certeza Económica, 01/01/1998, México, D. F. (Cortesía: INFOLATINA) Excellent description of previous protective policies towards national construction industry rearding public investment contracts, and impact of free trade agreements.

"Fijan un tabulador salarial la CMIC y sindicatos de la construcción", Entorno Laboral, 26-03-00 (Cortesía: INFOLATINA).

"Firman IMSS y AIETAC convenio para prevenir accidentes" Entorno Laboral, 28-08-00 (Cortesía: INFOLATINA).

"ICA se refugia en la vivienda", El Economista, 31-01-01 (Cortesía: INFOLATINA).

"Industria de la construcción, sector más activo", La Jornada, 5-01-00 (Cortesía: INFOLATINA).

"Industriales de la construcción exigen al gobierno federal la creación de un marco jurídico y administrativo que proporcione créditos", La Jornada, 18-02-00 (Cortesía: INFOLATINA).

"Internacionalización de la industria de la construcción", Certeza Económica, 01/01/1998, México, D. F. (Cortesía: INFOLATINA).

"Sumarán los PIDIREGAS 80 mil 499 MDP este año", Entorno Laboral 26-03-01 (Cortesía INFOLATINA).

"Vivienda, la rama más lastimada de la industria" Certeza Económica, 01/01/1998 México, D. F. (Cortesía: INFOLATINA).

Unpublished theses and dissertations

Campos, D.; L. Ma.; Del Río, A. (1989) Servicio del Seguro Social y riesgos de la fuerza de trabajo en la industria de la construcción. Unpublished Thesis, Licenciatura en Sociología, Universidad Autónoma Metropolitana-Azcapotzalco, México DF. (Description of Mexican legislation on health and safety in the Construction Industry and questionnaire results on health and safety conditions at two constructions sites in Mexico City, in 1987: a 10,000m^2 telephone exchange and 5,000m2 subway station).

Cornejo, Ma. T. (1986) Relaciones sociales y reproducción de los trabajadores en la industria de la construcción: el Grupo Durmac SA de CV, trabajo terminal para obtener la licenciatura en sociología, Universidad Autónoma Metropolitana, Azcapotzalco. (In-depth case studiy with interviews and survey of labour conditions on one construction site).

Munguía, R. (1979) La industria de la construcciónyla acumulación capitalista en México: los monopolios constructores y la explotación de la fuerza de trabajo, Tesis de licenciatura, UNAM-Arquitectura.

Sánchez, Ma. L. (1986) Niveles salariales y reproducción de la fuerza de trabajo en la industria de la construcción, Proyecto terminal para obtener la licenciatura en Sociología, Universidad Autónoma Metropolitana, Azcapotzalco. (In depth case study of working and living conditions of construction workers).

Slim, V. (1984) La Industria de la Construcción y sus Trabajadores en el Período 1970-1980, Unpublished Thesis, Licenciatura en Sociología, Universidad Nacional Autónoma de México (Based on secondary sources, case studies and interviews provides a critical account of labour conditions and relations in the industry, including the functioning of labour unions).

Soto, L.; Castro, Ma. C. (1991) Condiciones de vida y trabajo de la mujer en la industria de la construcción, caso de la central San Juan de Teléfonos de México. Unpublished Thesis, Licenciatura en Sociología, Universidad Autónoma Metropolitana-Azcapotzalco, México DF. (On the basis of questionnaires and participatory observation techniques, describes labour conditions of female workers employed on site at telephone exchange re-construction 1986-7, and compares them to those of unqualified male labourers).

Mexican (National) Construction Industry Chamber Publications

CMIC (2000) Situación de la Industria de la Construcción 2000, México.

Horcasitas, E. Vicepresidente de Relaciones interinstitucionales de la CMIC (1999) Posición de la Cámara Nacional de la Industria de la Construcción ante el Tratado de Libre Comercio", Foro "Análisis y Evaluación del Tratado de Libre Comercio de América del Norte y Acuerdos Paralelos", Senado de la República, 12-08-99.

CMIC various years Encuesta Nacional del Sector Formal de la Industria de la Construcción.

CMIC (2000) Programa de cursos septiembre 2000-febrero 2001.

CMIC-ICIC (2000) El camino ha sido largo, las satisfacciones muchas (http://www.cmic.org/capacitación).

National Statistics and Geographical Institute and other Official Statistical Sources

INEGI, (1985) "Hombres y mujeres en México", 2ª. ed., México.

INEGI, (1999) Principales Indicadores de las Empresas Constructoras, October 1999.

Secretaría de Economía (2000) "Inversión Extranjera Directa en la Construcción", http:www.economia-snci.gob.mx/inversi-n/Estad-sticas/cons.pdf.

Legislation

Carpynteyro, R. s/d Disposiciones Aplicables a las Obras Públicas (c. 1997).

Suárez, C. (1985b) Administración de Empresas Constructoras, México DF, Ediciones LIMUSA.

Ley de Adquisiciones y Obras Públicas 30-12-93.

Ley de Adquisiciones, Arrendamientos y Servicios del Sector Público, 4-01-00.

Ley de Obras Públicas y Servicios Relacionados con las Mismas, 4-01-00.