Foreign Workers and the Provision of Public Services: The Case of Kuwait

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Traditionally, most of the literature on labour migration in the Middle East has focused on the benefits received by both the labour-exporting and labour-importing countries The labour-exporting countries receive badly needed foreign exchange in the form of remittances from workers overseas The labour-importing countries, on the other hand, are able to augment their small and relatively untrained domestic labour forces

The merits of this approach to manpower began to be called into question with the post-1982 decline in oil revenues Even before its invasion by Iraq in August 1990, the Kuwaiti Government was beginning to assess the desirability of maintaining a large foreign workforce Not only were remittances of foreign exchange becoming a major budgetary problem, the country was also incurring a wide range of costs associated with the maintenance of a large foreign community

The problem is even more acute in post-war Kuwait It is now clear that the nation's population policy will have to be reconsidered in the light of the country's post-liberation resources At the time of the invasion Kuwait had a population of 2 2 million, of whom only 30 per cent were Kuwaitis Many services had been provided for the other 70 per cent (Dullforce, 1991)

The purpose of this article is to provide some insight as to the scope for population policy in post-war Kuwait Officially the Government is committed to reducing the expatriate population To this end all employment contracts for foreign workers agreed before Iraq's invasion have been declared invalid Under new regulations issued by Kuwait's Civil Service Commission, foreigners will be able to work for the Government only if no Kuwaiti is available for the job (Nicholson, 1991) Given the fact that almost all employed Kuwaitis already work in senior Government positions, it is unclear how many foreign workers will in fact lose their jobs Many jobs involve menial tasks for which Kuwaitis have traditionally shown little inclination

Given this fact, it is of interest to determine the likely demands which the foreign workforce (and accompanying dependants) will place on the country's public services While analogies with pre-invasion Kuwait are difficult (Maddison, 1991), an examination of the foreign workforce/public services relationships before the war should provide some insights as to the likely course which the country will follow in the early post-recovery period In particular, the analysis below attempts to determine which public services were most likely to be responsive to increases in the foreign population Were these services provided to both Arab and Asian workers alike or were the patterns of supply somewhat different by nationality?

Did public services adjust quickly to increases in the foreign population or were
the increased provisions spread out gradually over time?

Patterns of Growth
Before the invasion, Kuwait's population had been increasing rapidly (see Table
I), increasing the demands placed on public services In particular

| Group | Average annual growth | | | |
	1970/75	1975/80	1980/85	1970/85
Kuwaiti				
Male	6 2	3 5	3 8	4 5
Female	6 5	3 9	3 7	4 7
Total	6 3	3 7	3 8	4 6
Other Arab				
Male	5 2	7 5	2 2	4 9
Female	7 3	5 2	2 4	4 9
Total	6 0	6 5	2 3	4 9
Asian				
Male	3 5	17 3	10 0	10 1
Female	14 4	12 5	16 0	14 3
Total	6 4	15 8	10 5	10 8
African				
Male	− 9 7	24 5	4 1	5 4
Female	− 12 1	47 5	7 4	11 3
Total	− 10 6	32 0	5 6	7 6
European				
Male	− 2 4	20 3	3 9	6 8
Female	− 1 9	16 0	3 1	5 5
Total	− 2 2	18 4	3 5	6 2
American				
Male	0 0	22 4	9 1	10 1
Female	− 4 4	17 6	10 8	7 6
Total	− 2 3	20 1	9 2	8 6
Total				
Male	5 3	7 4	4 4	5 7
Female	7 2	5 2	4 7	5 7
Total	6 2	6 4	4 6	5 7

Sources State of Kuwait, *Annual Statistical Abstract, 1983*, p 27 and *1988*, p 29, Ministry
of Planning, Central Statistical Office, 1984 and 1989, respectively

Table I
Kuwait Growth of the
Population, 1970-85

(1) The Kuwaiti segment of the population was one of the fastest growing in the world, increasing at an average annual rate of 6 3 per cent over the 1970-75 period While the rate of expansion of the national population had fallen in recent years, it still averaged over 4 5 per cent for the 1970-85 period

(2) Partly as a result of emigration, the non-Kuwaiti Arab population had also increased quite rapidly, averaging over 6 per cent during the 1970s While this rate declined to 2 27 per cent over the 1980-85 period, it still averaged nearly 5 per cent for the 1970-85 period as a whole

(3) In recent years, the largest expansion in population had come from Asian groups After averaging over 6 per cent growth in the 1970-75 period, Asians expanded at a rate of over 15 per cent during 1975-80 While slowing to a rate of increase of around 10 5 per cent in the first half of the 1980s, this group's average annual rate of growth was still over 10 per cent for the 1970-85 period as a whole

(4) The three minority populations in Kuwait had also been averaging rapid rates of increase Over the 1970-85 period, Americans experienced the most rapid annual increase (8 6 per cent), followed by Africans (7 6 per cent) and Europeans (6 2 per cent)

As a result of these differential growth rates, there had been a corresponding change in the share of the population accounted for by various ethnic groups in Kuwait (see Table II)

(1) At the time of its first census in 1957, Kuwaitis constituted around 55 per cent of the country's population This declined to 47 2 per cent in 1970 By 1980, Kuwaitis accounted for only 41 6 per cent of the population, and this figure had fallen to 40 1 per cent by 1985.

(2) The Arab population, while averaging around 42 per cent of the population over the 1970-80 period, declined to slightly under 38 per cent by 1985

(3) Correspondingly, the Asian population showed the greatest gains While averaging around 9 8 per cent of the population in 1970 and 1975, Asians increased to 15 per cent of the population in 1980 and nearly 20 per cent by 1985

Public services in Kuwait also expanded rapidly over the 1970-85 period, although not always at the same pace as the country's demographics While Kuwait's population increased at an average annual rate of 6 2, 6 4 and 4 6 per cent per annum over the periods 1970/75, 1975/80 and 1980/85, respectively, public services expanded at corresponding rates of 7 0, 4 5 and 8 6 per cent per annum (see Table III) For the period as a whole public services expanded about 1 per cent faster (6 7) than the population (5 7)

Within public services, public administration and defence had shown the most erratic growth, while education and health had experienced the most stable patterns of expansion Despite Kuwaiti generosity, there had not been parity in access to services Kuwaitis lived in better areas, as defined by availability

Group	1970	(%)	1975	(%)	1980	(%)	1985	(%)
Kuwaiti								
Male	175 5	(41 8)	236 6	(43 5)	280 6	(36 1)	338 8	(35 1)
Female	171 9	(53 9)	235 5	(52 2)	285 0	(49 0)	342 5	(46 8)
Total	347 4	(47 2)	472 1	(47 5)	565 6	(41 6)	681 3	(40 1)
Other Arab								
Male	184 7	(44 0)	237 4	(43 7)	340 2	(43 8)	378 7	(39 2)
Female	128 1	(40 2)	181 8	(40 3)	234 3	(40 3)	264 1	(36 1)
Total	312 8	(42 5)	419 2	(42 1)	574 5	(42 3)	642 8	(37 9)
Asian								
Male	56 0	(13 3)	66 6	(12 2)	148 0	(19 1)	237 9	(24 6)
Female	15 9	(5 0)	31 2	(6 9)	56 1	(9 6)	118 0	(16 1)
Total	71 9	(9 8)	97 8	(9 8)	204 1	(15 0)	335 9	(19 8)
African								
Male	0 5	(0 1)	0 3	(0 1)	0 9	(0 1)	1 1	(0 1)
Female	0 2	(0 1)	0 1	(0 1)	0 7	(0 1)	1 0	(0 1)
Total	0 7	(0 1)	0 4	(0 1)	1 6	(0 1)	2 1	(0 1)
European								
Male	2 6	(0 6)	2 3	(0 4)	5 8	(0 7)	7 0	(0 7)
Female	2 2	(0 7)	2 0	(0 4)	4 2	(0 7)	4 9	(0 7)
Total	4 8	(0 7)	4 3	(0 4)	10 0	(0 7)	11 9	(0 7)
American								
Male	0 4	(0 1)	0 4	(0 1)	1 1	(0 1)	1 7	(0 2)
Female	0 5	(0 2)	0 4	(0 1)	0 9	(0 2)	1 5	(0 2)
Total	0 9	(0 1)	0 8	(0 1)	2 0	(0 1)	3 1	(0 2)
Total								
Male	419 9	(100 0)	543 7	(100 0)	776 6	(100 0)	965 3	(100 0)
Female	318 8	(100 0)	451 1	(100 0)	581 4	(100 0)	732 0	(100 0)
Total	736 7	(100 0)	994 8	(100 0)	1,358 0	(100 0)	1,697 8	(100 0)

Sources State of Kuwait, *Annual Statistical Abstract, 1983*, p 27 and *1988*, p 29, Ministry of Planning, Central Statistical Office, 1984 and 1989, respectively

Table II
Kuwait Population,
1970-85 (Thousands)

of services, type of housing, standard of environment and use of domestic labour In education, university entrance strongly favoured Kuwaitis.

However, as indicated by Al-Moosa and McLachlan (1985), the comparative privilege of access to services by Kuwaitis defied any simple universal formula for attributing costs of the social services and infrastructure on a group-by-group basis (p. 119)

(a) *Cost (millions 1985 dinars)*								
	1970	(%)	1975	(%)	1980	(%)	1985	(%)
Public administration and defence	223 3	(54 2)	280 9	(48 7)	265 5	(37 0)	434 6	(40 1)
Sanitary and related services	12 0	(2 9)	17 3	(3 0)	23 9	(3 3)	45 6	(4 2)
Education	101 6	(24 7)	170 2	(29 5)	261 1	(36 4)	397 7	(36 7)
Health	47 2	(11 5)	69 5	(12 1)	104 8	(14 6)	136 0	(12 5)
Social security welfare	6 6	(1 6)	13 1	(2 3)	21 0	(2 9)	28 2	(2 6)
Culture and recreation	21 2	(5 1)	25 7	(4 5)	41 1	(5 7)	41 6	(3 8)
Total	411 9	(100 0)	576 7	(100 0)	717 4	(100 0)	1,083 7	(100 0)

(b) *Average annual growth*				
	1970/75	1975/80	1980/85	1970/85
Public administration and defence	4 7	– 1 1	10 4	4 5
Sanitary and related services	12 6	6 7	13 8	9 3
Education	10 8	8 9	8 8	9 5
Health	8 0	8 6	5 4	7 3
Social security welfare	14 7	9 9	6 1	10 2
Culture and recreation	3 9	9 8	0 2	4 6
Total	7 0	4 5	8 6	6 7

Source Computed from International Monetary Fund, *Government Finance Statistics Yearbook*, various issues, International Monetary Fund, Washington DC

Table III.
Kuwait Public Services
1970-1985

In order to compensate for the higher level of goods and services available to Kuwaitis, and often their better quality, an entirely subjective assumption has been made after talks with various authorities, both Kuwaiti and non-Kuwaiti, that a factor of two shall be used to multiply Kuwaiti shares of services and other benefits against that allocated to the foreign groups (Al-Moosa and McLachlan, 1985, p 119)

On this basis, Al-Moosa and McLachlan allocated the costs of Government expenditures in 1980 between the Kuwaiti and non-Kuwaiti populations (see Table IV) Their estimates indicate that approximately 40 per cent of current and

Expenditure item	Amount (millions Kuwaiti dinars)
Defence, security and justice	124 8
Education	89 6
Health	64 0
Information	12 9
Social and labour affairs	17 8
Electricity and water	113 5
Public works	19 7
Communications	12 3
Customs and ports	4 1
Finance	13 0
Oil	1 1
Planning	7 8
Housing and Government properties	0 4
Amiri Court	52 4
Unclassified and transfer expenditures	319 1
Land acquisition	126 9
Investment expenditure	
Public works	75 1
Electricity and water	123 9
Communications	5 2
Other	2 9
Total	1,186 5

Source Al-Moosa and McLachlan (1985), p 120

investment costs could be attributed to the foreign community If the land acquisition programme expenses are omitted as being entirely inapplicable to the non-Kuwaitis in the population, the total relevant costs dropped to about 37 8 per cent of all expenditures in the budget

Clearly, the foreign labour force carried some opportunity costs for Kuwait In addition to the direct costs noted above, two others existed the underdevelopment of the Kuwaiti labour force as a result of the substitution of foreigners in a number of sectors of activity, and the foregoing of policies for the application of high technology and capital-intensive means of development and administration to the detriment of improved productivity by the Kuwaiti workforce (Al-Moosa and McLachlan, 1985, p 121)

In sum, the employment of foreigners resulted in consumption of income, a large portion of it foreign exchange It could be argued that each foreigner

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employed was equivalent to the abstention from investment in alternative assets.

On a crude basis, the costs of the foreign labor force diminish on a more or less pro rata scale the funds which could otherwise have been available for placement overseas in portfolio investments earning a steady income Plainly, not all foreign workers could be done without But, given the existence of disguised unemployment and the substitution of foreigners for Kuwaitis (as reflected in participation rates), there must be a significant proportion of the foreign workforce for which there is an opportunity cost of the kind described (Al-Moosa and McLachlan, 1985, p 121)

Given the relative importance of the issue, it is interesting that, other than Al-Moosa and McLachlan's somewhat arbitrary allocation of costs to the foreign population, no studies have examined the extent to which this group placed demands on the Kuwaiti public sector. In particular, for policy purposes it would be interesting to know whether these demands were uniform across all services, as assumed by Al-Moosa and McLachlan, and whether the demands were placed on public services similar by ethnic type (non-Kuwaiti Arab versus Asian)? The estimates undertaken in the following section are a first attempt in this direction

A Framework for Analysis

In terms of the structure of the model used for estimating the demands placed on public services by the foreign population, recent research (Looney. 1984, 1987) has shown that oil economies experience adjustments over time to a number of different shocks For example, it can be demonstrated that an equation of the Koyck (1954) form

$$y = a\text{FOREIGN} + by_{\text{L}} + z \tag{1}$$

implies an exponential decay scheme, whereby the effect of a once and for all increase in, say, foreign labour (FOREIGN) would not only affect the demand for a particular type of Government service during that period, but would also have (in declining terms) an impact on its provision in future years This result stems directly from the inclusion of the value of the public service lagged one year (by_{L}) on the right-hand side of the equation (Rao and Miller, 1970)[1]

Impact patterns along these lines are easy to imagine in Kuwait's case, where oil-supported inflows of foreign workers began straining the country's infrastructure, particularly during periods when the economy was already running at full capacity Of course, oil economies experience a number of simultaneous (although not necessarily directly overlapping) cumulative expansions and contractions, and these must be systematically controlled for before any reliable estimates can be made of the impact of a particular variable For example, in the case of an oil boom, gross domestic product and the foreign workforce are both likely to be increasing simultaneously To determine whether the expanded foreign labour force is acting as an independent element in stimulating increases in the provision of public services, we need first to control for the overall increase in resources (gross domestic product)

With these considerations in mind, the form of the estimated equation was of the type

$$y = a\text{GDP} + by_L + c\text{ARABP} + d\text{ASIANP}$$

where

y	= public service,
y_L	= public service lagged one year,
GDP	= gross domestic product,
ARABP	= the Arab population in Kuwait,
ASIANP	= the Asian population in Kuwait,
KUWAITP	= the Kuwaiti population

To determine the relative contribution of the ethnic constitution of the labour force, the equations were estimated in stepwise fashion with the Kuwaiti population term introduced first, followed by GDP and then the foreign populations

Results

In general, the results (see Tables V, VI and VII) provided some interesting findings

(1) With regard to education and health (see Table V), it appears that over time increases in both the Arab and Asian population resulted in a fairly large expansion in educational services This expansion was over and above that which could be attributed to increases in the Kuwaiti population and in the overall level of GDP

(2) It appears that public expenditures on Kuwaitis had been established and assured. These programmes were not particularly affected by the relatively small increase in the Kuwaiti population, and instead responded marginally to the higher rates of growth of Arab and Asian populations

(3) Based on the size of the regression coefficient, increases in the Arab population were about twice as strong as the Asian population in eliciting an expansion in educational services

This finding is consistent with the fact that Arab families usually had more children but, perhaps more importantly, they had easier access to the country's school system than their Asian counterparts (Al-Said, 1987)

In terms of health services (see Table V)

(1) Again, an expansion in the non-Kuwaiti Arab population appears to have resulted in an expansion of the country's health services As with education, this expansion was not the result of a simultaneous expansion of GDP or the Kuwaiti population

(2) Increases in the Asian population did not appear to have prompted the Kuwaiti authorities to expand their health facilities.

(3) In the provision of both education and health, there did not appear[2] to be a long-run distributed lag-type relationship, where a jump in the foreign population stimulated the authorities gradually to expand services

Education (EDUCP)

(1) EDUCP = 1 00 EDUCPL + 0 02 KUWAITP
            (25 92)   (0 77)
    $RHO = -1 62, t = -1 29, r^2 = 0 986, F = 385 77, DW = 2 40$

(2) EDUCP = -1 44 EDUCPL -   0 01 GDP   +   1 63 ARABP
            (-1 51)   (-0 81)   (2 49)
    $RHO = 0 41, t = 1 72, r^2 = 0 777, F = 11 61, DW = 1 37$

(3) EDUCP = -1 35 EDUCPL + 1 69 ARABP
            (-1 44)   (2 62)
    $RHO = 0 41, t = 1 68, r^2 = 0 767, F = 18 10, DW = 1 37$

(4) EDUCP = -1 41 EDUCPL + 1 12 ARABP   +   0 61 ASIANP
            (-1 81)   (2 05)   (2 77)
    $RHO = 0 23, t = 0 89, r^2 = 0 908, F = 32 73, DW = 1 78$

(5) EDUCP = -1 49 EDUCPL -   0 01 GDP   + 1 11 ARABP   + 0 62 ASIANP
            (-1 83)   (-0 57)   (1 94)   (2 55)
    $RHO = 0 00, t = 0 00, r^2 = 0 000, F = 00 00, DW = 0 00$

Health (HEALTHP)

(6) HEALTHP = 1 00 HEALTHPL -   0 01 KUWAITP
                (23 19)   (-1 00)
    $RHO = 0 26, t = -0 14, r^2 = 0 981, F = 284 81, DW = 1 75$

(7) HEALTHP = 0 65 HEALTHPL   +   0 10 ARABP
                (4 75)   (2 45)
    $RHO = -0 09, t = -0 35, r^2 = 0 988, F = 447 54, DW = 1 85$

(8) HEALTHP = 0 66 HEALTHPL -   0 01 GDP   +   0 08 ARABP
                (5 52)   (-1 49)   (2 16)
    $RHO = -0 24, t = -0 95, r^2 = 9 992, F = 426 88, DW = 1 87$

(9) HEALTHP = 0 71 HEALTHPL   +   0 10 ARABP   -   0 01 ASIANP
                (1 41)   (2 37)   (-0 11)
    $RHO = -0 11, t = -0 40, r^2 = 0 988, F = 277 96, DW = 1 87$

Notes
HEALTHP = health expenditures, HEALTHPL = health expenditures lagged one year,
EDUCP = educational expenditures, EDUCPL = educational expenditures lagged one year,
KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population,
GDP = gross domestic product

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW = Durbin Watson statistic, t-statistic in parentheses

Table V
Kuwait, Longer-run
Effects of Population
Growth on the
Provision of
Educational and Health
Services, 1970-1985
(Ordinary Least-
squares Estimates)

With regard to welfare and recreational programmes (see Table VI)

(1) There is some evidence that the Arab population may have participated
     in the country's welfare programmes, but this effect is very weak at best
     Asians did not appear to participate in these programmes This result
     is consistent with a number of regulations in Kuwait at the time which
     effectively excluded these groups from sharing in programmes of this type

(2) Increases in the Arab population had a considerable effect on the provision of recreational and cultural services In contrast, Asian groups placed few demands on this type of service

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Social security welfare (SOCSP)

(1) $SOCSP = 0.97\ SOCSPL + 0.01\ KUWAITP$
     (18 29)   (0 36)
     $RHO = -0.49,\ t = -2.12,\ r^2 = 0.972,\ F = 188.61,\ DW = 2.16$

(2) $SOCSP = 0.22\ SOCSPL + 0.05\ ARABP$
     (0 69)   (2 31)
     $RHO = -0.14,\ t = -0.54,\ r^2 = 0.963,\ F = 142.98,\ DW = 2.00$

(3) $SOCSP = 0.40\ SOCSPL - 0.01\ GDP + 0.03\ ARABP$
     (1 32)   (-1 25)   (1 48)
     $RHO = -0.39,\ t = -1.56,\ r^2 = 0.978,\ F = 146.13,\ DW = 2.06$

(4) $SOCSP = 0.09\ SOCSPL + 0.06\ ARABP + 0.01\ ASIANP$
     (0 24)   (2 34)   (0 34)
     $RHO = -0.03,\ t = -0.12,\ r^2 = 0.942,\ F = 70.90,\ DW = 1.99$

(5) $SOCSP = 0.47\ SOCSPL - 0.01\ GDP + 0.03\ ARABP - 0.01\ ASIANP$
     (1 39)   (-1 28)   (1 35)   (-0 29)
     $RHO = 0.24,\ t = -1.78,\ r^2 = 0.979,\ F = 106.27,\ DW = 2.11$

Recreational and cultural services (CSP)

(6) $CSP = 0.93\ CSPL + 0.01\ KUWAITP$
     (16 37)   (2 18)
     $RHO = -0.61,\ t = -2.84,\ r^2 = 0.966,\ F = 154.97,\ DW = 1.60$

(7) $CSP = 0.90\ CSPL - 0.01\ GDP + 0.01\ KUWAITP$
     (8 45)   (-0 30)   (2 10)
     $RHO = -0.60,\ t = -2.83,\ r^2 = 0.966,\ F = 94.38,\ DW = 1.56$

(8) $CSP = -0.27\ CSPL + 0.11\ ARABP$
     (-0 98)   (4 15)
     $RHO = 0.25,\ t = 0.98,\ r^2 = 0.903,\ F = 51.08,\ DW = 2.03$

(9) $CSP = 0.07\ CSPL + 0.09\ ARABP + 0.01\ GDP$
     (0 31)   (4 14)   (2 18)
     $RHO = -0.40,\ t = -1.63,\ r^2 = 0.978,\ F = 147.22,\ DW = 2.25$

(10) $CSP = -0.20\ CSPL + 0.11\ ARABP - 0.01\ ASIANP$
     (-1 73)   (3 69)   (-0 51)
     $RHO = 0.22,\ t = 0.85,\ r^2 = 0.912,\ F = 34.49,\ DW = 2.12$

Notes
SOCSP = social security welfare expenditures, SOCSPL = social security welfare expenditures lagged one year, KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population, GDP = gross domestic product, CSP = Recreational and cultural services expenditures, CSPL = Recreational and cultural services expenditures lagged one year

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW = Durbin Watson statistic, t-statistic in parentheses

In terms of administrative and sanitary services (see Table VII) it appears that

(1) Increases in the Arab population did not result in a corresponding expansion of these expenditures

(2) On the other hand, increased Asian populations had been associated with an expansion of both types of expenditures (with sanitary services considerably weaker than administration or defence)

Administration and defence (PADP)

(1) $PADP = 0\,95\ PADPL - 0\,06\ KUWAITP$
$\quad\quad\quad\quad\quad\quad (4\,70)\quad\quad\quad (-0\,86)$
$RHO = -0\,32,\ t = -1\,29,\ r^2 = 0\,688,\ F = 12\,13,\ DW = 1\,95$

(2) $PADP = 0\,48\ PADPL + 0\,20\ ARABP$
$\quad\quad\quad\quad\quad\quad (1\,71)\quad\quad\quad (1\,35)$
$RHO = 0\,02,\ t = 0\,07,\ r^2 = 0\,563,\ F = 7\,11,\ DW = 1\,90$

(3) $PADP = -0\,09\ PADPL - 0\,54\ ARABP + 1\,08\ ASIANP$
$\quad\quad\quad\quad\quad\quad (-0\,34)\quad\quad\quad (-2\,23)\quad\quad\quad (3\,41)$
$RHO = -0\,03,\ t = -0\,10,\ r^2 = 0\,810,\ F = 14\,22,\ DW = 2\,11$

(4) $PADP = -0\,47\ PADPL + 0\,02\ GDP - 0\,79\ ARABP + 1\,66\ ASIANP$
$\quad\quad\quad\quad\quad\quad (-1\,83)\quad\quad\quad (1\,91)\quad\quad\quad (-2\,06)\quad\quad\quad (3\,90)$
$RHO = 0\,41,\ t = 1\,69,\ r^2 = 0\,733,\ F = 6\,18,\ DW = 1\,86$

Sanitary and Related Services (SANP)

(5) $SANP = 1\,10\ SANPL - 0\,01\ KUWAITP$
$\quad\quad\quad\quad\quad\quad (14\,53)\quad\quad\quad (-1\,07)$
$RHO = 0\,27,\ t = 1\,14,\ r^2 = 0\,951,\ F = 106\,65,\ DW = 1\,76$

(6) $SANP = 0\,91\ SANPL + 0\,02\ ARABP$
$\quad\quad\quad\quad\quad\quad (6\,69)\quad\quad\quad (1\,41)$
$RHO = -0\,26,\ t = 1\,04,\ r^2 = 0\,954,\ F = 114\,41,\ DW = 1\,79$

(7) $SANP = 0\,93\ SANPL + 0\,01\ GDP + 0\,02\ ARABP$
$\quad\quad\quad\quad\quad\quad (5\,49)\quad\quad\quad (0\,12)\quad\quad\quad (1\,34)$
$RHO = 0\,24,\ t = 0\,95,\ r^2 = 0\,956,\ F = 73\,13,\ DW = 1\,80$

(8) $SANP = -0\,41\ SANPL - 0\,01\ ARABP + 0\,08\ ASIANP$
$\quad\quad\quad\quad\quad\quad (1\,45)\quad\quad\quad (-0\,56)\quad\quad\quad (1\,89)$
$RHO = 0\,33,\ t = 1\,34,\ r^2 = 0\,960,\ F = 79\,59,\ DW = 1\,67$

Notes
PADP = public administration and defence, PADPL = public administration and defence expenditures lagged one year, SANP = sanitary and related services, SANPL = sanitary and related services lagged one year, KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population, GDP = gross domestic product

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW = Durbin Watson statistic, t-statistic in parentheses

Table VII
Kuwait, Longer-run
Effects of Population
Growth on the
Provision of
Administrative and
Sanitary Services,
1970-1985

These results are a bit difficult to explain without returning to the fairly well-known fact that the Kuwaiti authorities had been increasingly concerned with internal security (largely surrounding the large Palestinian population), and had felt it more desirable to import Asian workers in recent years This expansion of Asian workers had occurred simultaneously with the country's large defence build-up

Interestingly enough, with the possible exception of sanitary services and perhaps social security and welfare, public services in Kuwait demonstrated considerable instability — they did not follow the distributed lag-type relationship, whereby they expanded or contracted gradually over time to changes in GDP and/or the foreign population This finding suggests that a short-run formulation may be more appropriate for estimating the linkage between the foreign population and the provision of public services

With these considerations in mind, it was assumed that in the short run the various ministries in Kuwait responded to general guidelines laid down by the authorities concerning the size of the Government's budget for the forthcoming year These guidelines were based on assumed revenues and past patterns of Government expenditures Here for simplicity we assume that these various services were linked to the expected level of Government expenditures (GEE)[3]

During the fiscal year, as the revenue picture cleared up, the Government budget was systematically either increased or decreased, depending on the situation in the oil markets In this situation, each ministry is assumed to have accrued a bonus (in years of higher than anticipated oil revenues) or cuts (in years of lower than anticipated oil revenues) This windfall (loss) term affected allocations to services and is depicted here by the unanticipated Government expenditure term (GEU), which is defined as the difference between actual Government expenditures in a given year and those anticipated at the beginning of the fiscal period

In sum, the estimated equations (with expected signs) were of the form

$$\text{SERVICES} = a + b\text{GEE}(+) + c\text{GEU} + d\text{KUWAITP}(+)$$
$$+ e\text{ARABP}(+) + f\text{ASIANP}(+) \qquad (3)$$

where

GEE = expected Government expenditures,
GEU = unexpected Government expenditures,
KUWAITP = Kuwaiti population,
ARABP = Arab population;
ASIANP = Asian population

Again, the equations were estimated in a stepwise fashion to determine the independent contribution of each of the ethnic populations

The results from this exercise (see Tables VIII, IX and X) were considerably superior to those obtained from the distributed lag estimations In general it appears that

(1) With regard to education and health there is clear evidence that the Arab population placed considerable demands on the country's resources This was not the case for the Asian segment of the population

(2) In Kuwait, education appeared to benefit from both increased levels of expected Government expenditures and windfall increases in Government expenditures Health expenditures did not appear to be closely related to changes in either expected or unexpected levels of Government expenditures

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Education (EDUCP)

(1) EDUCP = 0 43 GEE + 0 30 GEU + 0 01 KUWAITP
    (8 77)   (2 12)   (0 33)
    $RHO = 0\,04$, $t = 0\,19$, $r^2 = 0\,921$, $F = 38\,81$, $DW = 1\,77$

(2) EDUCP = 0 16 GEE + 0 01 KUWAITP + 0 44 ARABP
    (2 49)   (0 22)   (4 76)
    $RHO = -1\,37$, $t = -1\,31$, $r^2 = 0\,987$, $F = 262\,18$, $DW = 1\,90$

(3) EDUCP = 0 15 GEE + 0 19 GEU + 0 03 KUWAITP + 0 43 ARABP
    (2 11)   (1 80)   (1 07)   (4 38)
    $RHO = -1\,06$, $t = -0\,98$, $r^2 = 0\,988$, $F = 181\,69$, $DW = 2\,30$

(4) EDUCP = 0 16 GEE + 0 44 ARABP + 0 01 ASIANP
    (1 70)   (4 84)   (0 31)
    $RHO = -1\,41$, $t = -1\,87$, $r^2 = 0\,988$, $F = 264\,53$, $DW = 1\,80$

(5) EDUCP = 0 23 GEE + 0 16 GEU + 0 45 ARABP − 0 16 ASIANP
    (2 84)   (1 96)   (6 48)   (−1 34)
    $RHO = -1\,82$, $t = 1\,59$, $r^2 = 0\,993$, $F = 342\,11$, $DW = 2\,08$

Health (HEALTHP)

(6) HEALTHP = 0 05 GEE − 0 01 KUWAITP + 0 24 ARABP
    (1 41)   (−0 27)   (4 08)
    $RHO = 0\,40$, $t = 1\,62$, $r^2 = 0\,943$, $F = 55\,19$, $DW = 1\,81$

(7) HEALTHP = 0 08 GEE + 0 06 GEU − 0 01 KUWAITP + 0 18 ARABP
    (3 09)   (2 10)   (−0 80)   (4 22)
    $RHO = -0\,02$, $t = -0\,06$, $r^2 = 0\,985$, $F = 146\,80$, $DW = 2\,00$

(8) HEALTHP = 0 01 GEE + 0 18 ARABP + 0 13 ASIANP
    (0 13)   (4 05)   (1 89)
    $RHO = 0\,12$, $t = 0\,49$, $r^2 = 0\,977$, $F = 147\,69$, $DW = 1\,65$

(9) HEALTHP = 0 04 GEE + 0 04 GEU + 0 18 ARABP + 0 07 ASIANP
    (0 70)   (0 91)   (4 23)   (0 81)
    $RHO = -0\,03$, $t = 0\,01$, $r^2 = 0\,985$, $F = 143\,55$, $DW = 1\,76$

Notes

EDUCP = educational expenditures, HEALTHP = health expenditures, GEE = expected Government expenditures, GEU = unexpected Government expenditures, KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW = Durbin Watson statistic, t-statistic in parentheses

Table VIII
Kuwait, Short-run Effects of Population Growth on the Provision of Educational and Health Services, 1970-1985

(3) The Arab population also benefited considerably from expanded social security and welfare expenditures and recreational and cultural services. Again, the Asian population clearly did not have access to allocations of this type

(4) Given the results from the distributed lag estimates (see Table VI), the Arab population did not appear to be able to obtain quasi-permanent social security and welfare payments Apparently the Kuwaiti Government did provide short-run benefits of this type, but these terminated fairly quickly

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Social security welfare (SOSCP)

(1) SOCSP = 0 01 GEE   – 0 01 KUWAITP +   0 07 ARABP
        (0 13)   (–0 80)   (4 05)
$RHO = 0\ 14$, $t = 0\ 54$, $r^2 = 0\ 937$, $F = 49\ 61$, $DW = 1\ 92$

(2) SOCSP = 0 01 GEE   + 0 02 GEU   + 0 06 ARABP
        (0 20)   (1 92)   (4 94)
$RHO = -0\ 11$, $t = -\ 042$, $r^2 = 0\ 971$, $F = 110\ 17$, $DW = 1\ 87$

(3) SOCSP = –0 01 GEE   + 0 07 ARABP   + 0 02 ASIANP
        (–0 39)   (3 97)   (0 58)
$RHO = 0\ 07$, $t = 0\ 28$, $r^2 = 0\ 945$, $F = 57\ 25$, $DW = 1\ 98$

(4) SOCSP = 0 02 GEE   + 0 03 GEU   + 0 06 ARABP   – 0 04 ASIANP
        (1 54)   (2 05)   (6 05)   (1 69)
$RHO = -0\ 36$, $t = -1\ 42$, $r^2 = 0\ 984$, $F = 140\ 05$, $DW = 2\ 06$

Recreational and cultural services (RCSP)

(5) RCSP = –0 01 GEE   + 0 01 KUWAITP +   0 10 ARABP
        (–1 03)   (0 63)   (5 31)
$RHO = 0\ 27$, $t = -0\ 21$, $r^2 = 0\ 954$, $F = 68\ 41$, $DW = 2\ 07$

(6) RCSP = –0 01 GEE   + 0 04 GEU   + 0 01 KUWAITP +   ARABP
        (–1 –2)   (0 26)   (0 65)   (5 12)
$RHO = -0\ 10$, $t = -0\ 36$, $r^2 = 0\ 957$, $F = 50\ 25$, $DW = 2\ 05$

(7) RCSP = –0 01 GEE   + 0 10 ARABP   + 0 01 ASIANP
        (–0 63)   (5 04)   (0 10)
$RHO = -0\ 03$, $t = -\ 010$, $r^2 = 0\ 949$, $F = 62\ 11$, $DW = 2\ 05$

(8) RCSP = –0 01 GEE   + 0 02 GEU   + 0 10 ARABP   + 0 01 ASIANP
        (–0 41)   (0 81)   (4 77)   (0 11)
$RHO = -0\ 03$, $t = -0\ 10$, $r^2 = 0\ 949$, $F = 42\ 08$, $DW = 2\ 06$

Notes
SOCSP = social and welfare expenditures, RCSP = recreational and cultural expenditures, GEE = expected Government expenditures, DEU = unexpected Government expenditures, KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW = Durbin Watson statistic, t-statistic in parentheses

Table IX
Kuwait, Short-run
Effects of Population
Growth on the
Provision of
Educational and Health
Services, 1970-1985

Public administration and defence (PADP)

(1) PADP = 0 24 GEE + 0 52 GEU – 0 01 KUWAITP
           (3 28)   (3 84)   (–0 66)
  RHO = 0 38, t = 1 59, r^2 = 0 747, F = 9 89, DW = 1 50

(2) PADP = 0 68 GEE + 0 56 GEU – 0 03 KUWAITP – 0 09 ARABP
           (9 61)   (5 46)   (–0 91)   (–0 91)
  RHO = –0 72, t = – 3 87, r^2 = 0 976, F = 90 61, DW = 2 30

(3) PADP = 0 65 GEE + 0 60 GEU – 0 07 ARABP – 0 02 ASIANP
           (4 89)   (4 47)   (–0 63)   (–0 80)
  RHO = –0 63, t = –3 07, r^2 = 0 971, F = 75 47, DW = 1 98

Sanitary and related services (SANP)

(4) SANP = 0 06 GEE + 0 04 GEU – 0 03 KUWAITP
           (7 01)   (3 36)   (–0 92)
  RHO = 0 54, t = 2 40, r^2 = 0 856, F = 19 78, DW = 1 28

(5) SANP = 0 04 GEE + 0 03 GEU – 0 04 KUWAITP + 0 06 ARABP
           (1 93)   (2 59)   (–1 12)   (1 39)
  RHO = 0 73, t = 3 99, r^2 = 0 753, F = 6 87, DW = 1 13

(6) SANP = 0 04 GEE + 0 03 GEU + 0 05 ARABP
           (2 13)   (2 57)   (1 17)
  RHO = 0 69, t = 3 61, r^2 = 0 956, F = 10 32, DW = 1 29

(7) SANP = –0 01 GEE + 0 01 GEU + 0 15 ASIANP
           (–0 79)   (0 14)   (3 21)
  RHO = 0 51, t = 2 29, r^2 = 0 930, F = 44 15, DW = 1 56

(8) SANP = –0 01 GEE – 0 01 GEU – 0 03 ASIANP + 0 18 ASIANP
           (–0 90)   (–0 12)   (–1 07)   (3 23)
  RHO = 0 55, t = 2 44, r^2 = 0 930, F = 29 86, DW = 1 70

Notes
PADP = administration and defence expenditures, SANP = sanitary and related expenditures,
GEE = expected Government expenditures, GEU = unexpected Government expenditures,
KUWAITP = Kuwaiti population, ARABP = Arab population, ASIANP = Asian population

Values obtained as ordinary least-squares estimates

All economic variables are in constant 1980 prices

RHO = serial correlation term, F = F-statistic, r^2 = coefficient of determination, DW =
Durbin Watson statistic, t-statistic in parentheses

Table X.
Kuwait, Short-run
Effects of Population
Growth on the
Provision of
Administrative and
Sanitary Services,
1970-1985

(5) As with the distributed lag findings, it is unlikely that the Arab or Asian
      populations directly affected the provision of either administrative or
      sanitary services If anything, sanitary services may have been affected
      more on the supply side with increased numbers of Asian workers
      occupied in this activity

Conclusions
The results presented above provide support for the position that the foreign
labour force is likely to carry considerable opportunity costs for the Kuwaiti
Government If the situation in pre-invasion Kuwait is any indication, these
opportunity costs may be confined almost exclusively to the Arab workforce

rather than extending to the Asian component Despite the early post-liberation statements of Kuwaiti officials, it will not be possible to dispense entirely with foreign workers There is a good chance, however, that the Government's political policy (*New York Times*, 1991) of replacing Palestinian workers (Mallet, 1991) with those from Asia will provide the unintended benefit of considerable budgetary savings

Notes

1 All the empirical results which follow were obtained through an ordinary least-squares estimation procedure using the TSP statistical programme First-order serial correlation was corrected using the Cochrane Orcutt two-stage iterative technique This method estimates RHO from ordinary least-squares residuals and transforms the dependent and independent variables so that the residuals from the transformed equation will be roughly uncorrelated and then estimates the regression using the transformed variables (*cf* Hall and Hall, 1983, pp 22-3)

2 As evidenced by the lack of statistical significance in Table V of the lagged service term in equations (2)-(5) for education and equation (9) for health services

3 Expected levels of Government expenditures were estimated using the equation GE (t) = $a + b$GE($t - 1$) Where GE = Government expenditures, t = the current time-period (year) and ($t - 1$) = the previous time-period

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