

Studies in Contemporary Economics

Economic Consequences of Population Change in Industrialized Countries

Proceedings, Paderborn, West Germany, June 1983

Edited by Gunter Steinmann

IMPACT Paper no.

G-51

May 1984



Springer-Verlag Berlin Heidelberg New York Tokyo

MEASURING THE IMPACT OF STRUCTURAL CHANGE ON GROUPS
IN THE AUSTRALIAN LABOUR MARKET

by

SHEILA M. BONNELL

T.C. CHEW

and

PETER B. DIXON

La Trobe University, Bundoora, Victoria/Australia

I INTRODUCTION

This is the fifth of a series of papers on the effects of structural change on different groups in the Australian community written by La Trobe University members of the IMPACT Project.¹ So that the paper will be self-contained, we will repeat in section II some material from earlier papers on the nature of structural change and on our approach to measuring the incidence of the costs of structural change across different community groups. Then in section III we will summarize the results from our previous studies. Section IV overviews some new results on the effects of structural change on migrants classified by entry category and by duration of residence. Concluding remarks are in section V.

II MEASUREMENT OF THE INCIDENCE OF THE COSTS OF STRUCTURAL CHANGE

Modern economies are continually undergoing structural change. Changes are continually taking place in the occupational compositions of their work forces, the geographical distributions of their populations and the industrial compositions of their GDPs in response to, among other things, technical change, changes in industry assistance, capital accumulation and changes in world commodity prices. Structural changes are of little concern during periods of rapid overall growth when all sectors of the economy are achieving positive growth rates and intersectoral shifts of existing resources are not required. However, in a period of low overall growth, such as that currently being experienced in Australia, structural change may require committed resources to be transferred to alternative uses. These transfers may involve resources becoming idle for lengthy periods imposing serious costs on the possessors of particular labour skills and on the owners of specific types of capital.

¹ IMPACT is an economic and demographic research project conducted by Commonwealth Government agencies in association with the Faculty of Economics and Commerce at the University of Melbourne and the School of Economics at La Trobe University.

In low growth periods it is often argued that the costs associated with structural changes are borne very unevenly across different groups in the community. Inevitably, some groups are disproportionately represented in the ownership of resources (skills and capital) which are displaced by structural change. Thus, for example, Stricker and Sheehan (1981, ch. 8) have argued that migrants in the Australian work force have suffered relative to non-migrants from the structural changes of the seventies. This is because migrants are over-represented in occupations and industries having declining shares in total employment.

In our earlier papers we have used a simple measure to test arguments, such as that of Stricker and Sheehan, concerning the incidence of the costs of structural change. This measure is re-applied in the new work reported in section IV. The measure is based on two key assumptions. The first is that in recessionary conditions job opportunities are of paramount importance. Thus we assume that a structural change adversely affects community group 1 relative to group 2 if the structural change limits group 1's job opportunities relative to those for group 2. Second, we assume that the main mechanism by which structural change affects the allocation of job opportunities across groups is by changing the occupational composition of the demand for labour.

With these assumptions in mind, we start the derivation of our indicator of the costs of structural change with the identity

$$N_b = \sum_{j=1}^n S_{bj} Q_j N \quad (1)$$

where N_b is the number of people in employment belonging to community group b , N is the total number of people employed, Q_j is the share of total employment accounted for by occupation j , $j=1, \dots, n$, and S_{bj} is the share of the employment in occupation j accounted for by group b . In our previous papers, summarized in section III, the bases for the groups, b , were age, sex and birthplace. The groups, b , in section IV are non-migrants, migrants of various entry categories and migrants of various durations of residence.

Next we express (1) in change form as follows:

$$\Delta N_b = \sum_{j=1}^n (\Delta S_{bj}) \bar{Q}_j \bar{N} + \sum_{j=1}^n \bar{S}_{bj} (\Delta Q_j) \bar{N} + \sum_{j=1}^n \bar{S}_{bj} \bar{Q}_j \Delta N \quad (2)$$

where ΔN_b , ΔS_{bj} , ΔQ_j and ΔN are changes in N_b , S_{bj} , Q_j and N over a period T which may be an historical period or a projection period for an economic model. Equation (2) is an approximation which is satisfactory for small changes. The accuracy of the approximation is usually increased substantially if the Q_j , N and S_{bj} appearing on the right-hand side

are evaluated at midpoints rather than at starting values. Midpoint evaluation is indicated by the bars. Thus, for example,

$$\bar{Q}_j = (Q_j(I) + Q_j(F))/2$$

where $Q_j(I)$ and $Q_j(F)$ are the initial and final values for Q_j .

There are some obvious reasons, which we will consider later in this section, for doubting whether the three terms on the right-hand side of (2) should be treated as though they are determined independently of each other. However, setting these doubts aside for a moment, we can say that the first term is the change in the employment of group b arising from changes in b 's share of the employment available in each occupation; the third term is the change in group b 's employment arising from the change in the aggregate level of employment; and the second term, on which our main interest will be focused, is the change in b 's employment arising from changes in the occupational composition of the demand for labour. We express this last-mentioned term as a percentage of group b 's midpoint employment level. This gives

$$c_b = 100 \sum_{j=1}^n \bar{W}_{bj} \Delta Q_j \quad (3)$$

where

$$\bar{W}_{bj} = \bar{S}_{bj} / (\bar{N}_b / \bar{N}) \quad \text{for all } b \text{ and } j. \quad (4)$$

The c_b 's are our indicators for the period T of the incidence of the costs of structural change.

For thinking about the properties of the c_b 's it is convenient to note that $\sum_j \Delta Q_j$ is zero so that (3) may be rewritten as

$$c_b = 100 \sum_{j=1}^n \bar{V}_{bj} \Delta Q_j, \quad (5)$$

where

$$\bar{V}_{bj} = \bar{W}_{bj} - 1. \quad (6)$$

$\bar{V}_{bj}$ is a measure of group b 's relative concentration in occupation j . It will be zero if group b holds the same share of the jobs in occupation j as it holds in total employment. It will be positive if group b is relatively concentrated in occupation j . For example, $\bar{V}_{bj}$ will be +1 if group b holds 10 per cent of the jobs in occupation j ($\bar{S}_{bj} = 0.1$) while holding only five per cent of the total number of jobs ($\bar{N}_b / \bar{N} = 0.05$). On the other hand, if group b is under-represented in occupation j , then $\bar{V}_{bj}$ will be negative. Thus, the c_b 's will be negative for groups whose employment is concentrated in occupations with declining shares

of total employment, while they will be positive for groups whose employment is concentrated in occupations with increasing shares. The groups with the largest negative c_b 's are those we would expect to be worst affected by structural change while the groups with positive c_b 's are those we would expect to be least adversely affected.

As indicators of the incidence of the costs of structural changes, the most attractive feature of the c_b 's is that they require a minimal data base. They can be computed for any set of changes, ΔQ_j , $j=1, \dots, n$, in occupational shares providing we have suitable information on employment classified by occupation. Given the modesty of these data requirements, it is not surprising that the c_b 's suffer many shortcomings. Before describing our applications of the c_b 's (sections III and IV), we briefly list some of their limitations.

The first problem is that the coverage of the c_b 's may be too narrow. They fail to reflect losses of physical capital or to attach any weight to movements of workers between industries and regions. Even if we accept the coverage of the c_b 's, they may nevertheless be biased by the choice of occupational classification. If the classification is too broad, then they may miss important differences in the impact of structural changes on the various community groups arising from shifts in the composition of employment at the sub-occupational level. If the classification is too fine, then the c_b 's may exaggerate the impact of structural changes on some groups by attaching weight to the displacement of workers who can be absorbed easily into very closely related occupations. A final difficulty worth mentioning is the one alluded to earlier in this section: it may not be legitimate to treat the three terms on the right-hand side of (2) as though they are independently determined. Consider, for example, the possibility raised by Sheehan (1981, p. 19) that "sharp changes in industry structure may have a direct impact on ethnic shares, perhaps because of the last on/first off principle or for other reasons". What this suggests is that technical change, changes in industry assistance and other changes causing shifts in the industrial (and hence occupational) composition of the demand for labour may also cause shifts in the birthplace shares in each occupation. In other words, where we are dealing with birthplace groups, our c_b 's may be misleading indicators of the relative impacts of structural change. Forces which are usually identified as causes of structural change may affect ΔN_b in equation (2) not only via the second term on the right-hand side but also via the first. The possibility that migrants are "first off" was examined empirically by Bonnell and Dixon (1982) who found no systematic tendency for migrant groups in the Australian

work force to lose share in declining occupations over 1971 to 1976. It may also be true that technical change, changes in industry assistance, etc., affect ΔN_b via the growth term (term three on the right-hand side of equation (2)). However, this would not invalidate the c_b 's as indicators of relative impacts. Subject to a small approximation error, the growth terms expressed as percentages of their N_b 's are all equal to the percentage growth in total employment ($100 \Delta N/N$).

III OVERVIEW OF LA TROBE/IMPACT PAPERS ON THE INCIDENCE OF THE COSTS OF STRUCTURAL CHANGE

In this section we describe applications which we have made in earlier papers of our measure, c_b , of the incidence of the costs of structural change. These applications, together with the ones to be outlined in section IV, are set out schematically in Table 1.

In the first application, Cook and Dixon (1982), the Australian work force was divided into 22 groups, b. These were two sexes by eleven birthplaces (Australia, UK, Germany, Greece, Italy, Malta, Netherlands, Poland, Yugoslavia, Other Europe and Other Countries). The paper was concerned with the effects on employment opportunities for migrant groups of three pressures for structural change thought likely to operate in the eighties.

Cook and Dixon used the ORANI model of the Australian economy² to project the effects of the three pressures on the shares in total employment of 72 occupations (ΔQ_j , $j=1, \dots, 72$). In the case of the first pressure, anticipated changes in world commodity prices, the ORANI model projected employment gains for farmers and losses for process workers, particularly in the metal trades. This was because the reductions occurring in the sixties and seventies in the world prices of machinery and equipment relative to those of temperate-zone agricultural products were forecast to continue. Because of the high concentration (i.e., positive V_{bj} 's, see equation (5)) of their employment in tool making and other equipment-related occupations, Southern European males were shown to be the group most adversely affected by the anticipated changes in world prices, i.e., they had the largest negative c_b 's. Australian-born females were projected to have the largest positive c_b 's. This reflected their low concentration in equipment-related occupations and their comparatively high concentration in farming. The second pressure, the further exploitation of mineral resources, was projected by ORANI to lead to appreciation of the real exchange rate thus reducing activity in the

²ORANI was developed as part of the IMPACT project. It is fully described in Dixon, Parmenter, Sutton and Vincent (1982).

Table 1. Overview of La Trobe/IMPACT Papers on the Incidence of the Costs of Structural Change

Paper	The community groups, b	Occupational classification scheme	Source of the changes (ΔQ_j 's) in occupational shares in total employment	Main changes in occupational shares:		Main gaining and losing community groups	
				Positive ΔQ_j 's	Negative ΔQ_j 's	Largest positive cb's	Largest negative cb's
Cook and Dixon (1982)	11 birthplaces x sex	72-order scheme derived from the Minor Groups in ABS catalogue No. 2114.0	ORANI simulations of the effects of : (i) changes in world commodity prices anticipated for the eighties, (ii) exploitation of new mineral discoveries, (iii) reductions in protection	Farming White-collar Farming	Process work Farming Process work	Australian-born females All females except Southern European Australian-born males	Southern European males Australian-born males Southern European females
Chew (1981)	11 birthplaces x sex x 8 age groups	As for Cook and Dixon (1982)	ORANI simulations of the effects of : (i) changes in world commodity prices anticipated for the eighties, (ii) exploitation of new mineral discoveries, (iii) reductions in protection	Farming White-collar Farming	Process work Farming Process work	Females, especially older Australian-born Young females Older Australian-born males	Southern European males, all ages Older Italian- and Australian-born males Middle-aged Southern European females
Bonnell and Dixon (1982)	11 birthplaces	71-order scheme derived from the Minor Groups in ABS catalogue No. 2114.0	Actual changes between 1971 and 1976	White-collar	Process work	Australian-born	Southern European
Bonnell (1982)	sex	As for Bonnell and Dixon (1982)	Actual changes between 1971 and 1976	White-collar	Process work	Females	Males

contd....

Table 1 (contd)

Paper	The community groups, b	Occupational classification scheme	Source of the changes (ΔQ_j 's) in occupational shares in total employment	Main changes in occupational shares:		Main gaining and losing community groups	
				Positive ΔQ_j 's	Negative ΔQ_j 's	Largest positive cb's	Largest negative cb's
Chew (1983)	(a) 5 durations of residence × sex	53-order scheme derived by mapping DIEA worker codes (354-order scheme) into ABS minor groups and aggregating where necessary	(1) Actual changes between 1971 and 1976	White-collar	Process work	All females, especially Australian-born and those arriving before 1966	Recent male arrivals
			(2) ORANI simulations of the effects of :				
			(i) increases in wage rates,	White-collar	Farming	All migrant females	Males, especially those arriving before 1966 and Australian-born
			(ii) increases in real absorption	White-collar	Farming	All migrant females	Males, especially those arriving before 1966 and Australian-born
			(iii) increases in protection	Process work	Farming	All migrant females especially those arriving since 1966	Australian-born males
	(b) 5 entry categories × sex		(1) Actual changes between 1971 and 1976	White-collar	Process work	All females except refugees	Australian-born males
			(2) ORANI simulations of the effects of :				
			(i) increases in wage rates,	White-collar	Farming	All migrant females except refugees	Australian-born males and all refugees
			(ii) increases in real absorption,	White-collar	Farming	All migrant females except refugees	Australian-born males and all refugees
			(iii) increases in protection	Process work	Farming	All females, especially refugees	Australian-born males

non-mineral exporting industries (e.g., farming) and some of the main import-competing industries (e.g., cars).³ Australian-born males were the group with the largest negative c_b resulting from the negative ΔQ_j 's for farming and other international-trade-related occupations. The wealth that would be created by the exploitation of minerals was projected to expand the service sector and white-collar employment. This latter development was shown to favour all females except those from Southern Europe who are under represented in white-collar occupations. The third pressure, a uniform across-the-board reduction in protection, was projected to have similar broad industrial effects to the first pressure, the anticipated changes in world commodity prices. Both these pressures favour exporting activity (especially farming) at the expense of import-competing activity. The main difference between the structural effects of the two pressures is that with a reduction in protection, textile industries replace equipment industries as the most adversely affected. Thus when we look at the third pressure in relation to the first we find in Table 1 that Southern European females (whose employment is relatively concentrated in textile-related occupations) replace Southern European males (whose employment is relatively concentrated in equipment-related occupations) as the groups with the largest negative c_b 's. We also find that Australian-born males replace Australian-born females as the group with the largest positive c_b . Australian-born males have very small shares in the textile occupations but are significantly represented in the equipment occupations.

In the second paper listed in Table 1, Chew (1981) added the dimension age to the Cook-Dixon study. Chew found that pressures affecting farming occupations were of most importance to older workers. Among females, younger workers were projected to be the major beneficiaries from expansions in white-collar employment. Middle-aged Southern European females were identified as the groups worst affected by reductions in protection.

A striking aspect of the results reported by Cook, Dixon and Chew was that the c_b 's were surprisingly small. For example, in the Cook-Dixon study, the largest negative c_b arising from a 25 per cent reduction in protection was -0.39 for Greek-born females. This can be interpreted as meaning that the structural changes associated with a 25 per cent reduction in protection would cost the worst affected group only 0.39 per cent of its jobs. Seemingly sharp changes in occupational shares (large ΔQ_j 's) become muted when they are turned into changes in employment opportunities for community groups. Each group is spread over all

³This is the well-known Gregory effect, see Gregory (1976).

occupations. Thus, in any change in the occupational composition of employment each group is represented in both "winning" and "losing" occupations.

In commenting on the paper by Cook and Dixon, Sheehan (1981, p. 19) remarked that "It is important to recall the basic constraint on the use of econometric models, that the usefulness of a particular version of a particular model is tied to its ability to represent the economic facts. While the experience of the 1970s is complex and interpretation of it is controversial, it does seem to me to be an established fact that certain migrants were seriously effected by the structural changes of this period. This is a fact against which any version of any model must be tested, rather than vice versa." Thus Sheehan doubted the validity of projections suggesting that structural change in the eighties would have little differential impact across birthplace groups. He felt that such projections were inconsistent with the experience of the seventies. Sheehan's view of the seventies, which was further developed in his book with Stricker⁴, was tested by Bonnell and Dixon (1982) in the third paper listed in Table 1.

In this paper Bonnell and Dixon calculated c_b 's for eleven birthplace groups using for the ΔQ_j 's the actual changes in occupational shares which occurred between 1971 and 1976. As was emphasized by Stricker and Sheehan (1981, ch. 8) the major changes in occupational structure in the seventies were the increase in the white-collar share and the reduction in the blue-collar share. Consistent with Stricker and Sheehan (1981, ch. 8), Bonnell and Dixon found that these structural changes favoured Australian-born workers and that migrants from Southern Europe were the most adversely affected. However, consistent with the projections of Cook, Dixon and Chew, the study of 1971 to 1976 revealed that the differential impact of structural change across birthplace groups was slight. There was little correlation between the c_b 's and various indicators of the labour market performance of the birthplace groups. That is, Bonnell and Dixon did not find support for the proposition that structural change was an important determinant of differences across birthplace groups in their labour market experiences.

The fourth paper listed in Table 1, Bonnell (1982), is similar to the previous one in that c_b 's were calculated for the period 1971 to 1976. Rather than birthplace groups, the groups in the Bonnell paper are males and females. From 1971 to 1976 there was a sharp increase in female wages relative to male wages associated with the implementation

⁴See Stricker and Sheehan (1981, ch. 8).

of equal pay, yet there was an increase in the female share of total employment. Bonnell (1982) tested the idea that gains in female employment due to structural change were sufficient to mask adverse effects on female employment arising from substitution of relatively cheaper male labour. Bonnell found that structural change explained only a minor part of the increase in the female share of the work force.

IV THE IMPACT OF STRUCTURAL CHANGE ON MIGRANTS CLASSIFIED BY DURATION OF RESIDENCE AND CATEGORY OF ENTRY

The final study listed in Table 1, Chew (1983), is an MSc thesis currently in progress. This work follows up the suggestion in Fisher (1982) that duration of residence in Australia and entry category may be more important characteristics than birthplace for analysing the labour market performance of migrants.

The Chew study refers to the Australian work force of the early eighties. The study is in two parts. In the first, there are 10 groups, b. These are, for each sex, the Australian-born and migrants divided into four duration-of-residence categories (those whose arrival was before 1966, between 1966 and 1970, between 1971 and 1975 and between 1976 and 1980). In the second part there are also 10 groups, b. These are, for each sex, the Australian-born and the migrants arriving between 1979 and 1981 classified according to four entry categories: family reunion, general eligibility, refugees and special eligibility. In both parts, c_b 's were computed for four sets of changes in occupational shares: the actual changes between 1971 and 1976 and changes projected by ORANI for increases in real wages, increases in real absorption and increases in protection.

The calculations in the Chew study based on the actual changes in occupational structure which occurred from 1971 to 1976 should be contrasted with those in the third and fourth papers listed in Table 1. Those Bonnell and Dixon papers were concerned with effects which were actually experienced whereas Chew's approach is counterfactual. He is concerned with assessing the vulnerability of groups presently in the labour force to various possible structural changes. One of the possibilities is that the experience of 1971 to 1976 will be repeated in the eighties.

Preliminary results from the first part of Chew's study are presented in Tables 2 and 3. Table 2 shows how migrants of various duration categories would be affected by a reoccurrence of the structural changes of the period 1971 to 1976, a period in which there was a sharp increase in white-collar employment relative to blue-collar. The c_b

Table 2: c_b 's for Duration Categories in the Current^a Australian Labour Force Calculated with the Changes in Occupational Shares of 1971 to 1976

Duration category	Females	Males	Persons
Arrival period			
before 1966	2.2	-2.1	-0.8
1966 to 1970	0.8	-2.5	-1.3
1971 to 1975	1.4	-1.6	-0.4
1976 to 1980	0.5	-2.8	-1.6
Australian-born	3.9	-0.9	0.9

^aThe duration categories refer to migrants in employment in Australia in February 1982. The c_b 's for the Australian-born reflect their occupational characteristics as shown in the 1976 Census.

calculations in Table 2 imply that a similar development in the eighties would, as it did in the seventies, reduce employment opportunities for males relative to females and for migrants relative to the Australian-born. Among migrant males, the most recent arrival group has a higher share of its employment in the blue-collar occupations than have the other male groups and a lower share in the white-collar. The same is true for the group of recently arrived female migrants in comparison with other female migrant groups. Thus, in Table 2, we find that the migrants who arrived between 1976 and 1980 have the smallest positive c_b among females and the largest negative c_b among males. The groups in Table 2 shown to be the most favoured by the relative increase in white-collar employment are Australian-born females and migrant females arriving before 1966.

In Table 3, c_b 's are shown for duration categories using ΔQ_j 's projected by ORANI for a .57 per cent increase in real wages, a .45 per cent increase in real absorption and a 10.6 per cent increase in all protection. The sizes of these policy shocks (.57, .45 and 10.6) were chosen to facilitate comparisons across the three simulations. Each shock is projected by ORANI to increase the consumer price index by one per cent.⁵

According to ORANI, increases in real wages are particularly harmful to exporting activities including farming. On the other hand they

⁵For a complete discussion of these three ORANI simulations, see Dixon, Parmenter and Powell (1982). A less technical discussion of the structural effects of alternative macro policies is in Dixon, Powell and Parmenter (1979, ch. 3).

Table 3: c_b 's for Duration Categories in the Current^a Australian Labour Force Calculated with Changes in Occupational Shares Projected by the ORANI Model for Three Macroeconomic Policy Changes

Duration category	.57% increase in real wages			.45% increase in real absorption			10.6% increase in all protection		
	Females	Males	Persons	Females	Males	Persons	Females	Males	Persons
Arrival period									
before 1966	.10	-.01	.02	.11	-.02	.02	.09	.00	.03
1966 to 1970	.12	.01	.05	.11	.01	.05	.15	.03	.07
1971 to 1975	.12	.03	.07	.12	.03	.07	.15	.04	.09
1976 to 1980	.11	.01	.04	.10	.00	.04	.16	.03	.08
Australian-born	.08	-.06	-.01	.08	-.06	-.01	.04	-.05	-.02

^aThe duration categories refer to migrants in employment in Australia in February 1982. The c_b 's for the Australian-born reflect their occupational characteristics as shown in the 1976 Cens.

do little damage to the service sector and white-collar employment. Thus, in Table 3, wage increases are shown as favouring female employment relative to that for males and migrant employment relative to that for the Australian-born. The groups losing most from the structural changes associated with wage increases are Australian-born males and migrant males who arrived before 1966. Both these groups have a significant attachment to farming. The ORANI projections for the structural effects of increases in absorption (i.e., Keynesian demand stimulation) are very similar to those for increases in real wages. Thus, the c_b 's in the real-absorption panel of Table 3 are almost identical to those in the first panel. The ORANI projections of the effects of increases in protection again indicate adverse consequences for farming occupations but the main gains are for process-workers rather than for white-collar workers. In the final panel of Table 3 females again are shown as benefiting relative to males and migrants relative to the Australian-born. The main differences between the results in the third panel and those in the first two panels are the more pronounced gains for female migrants arriving since 1966. These groups are favoured by increased protection because of the concentration of their employment in the textile-related occupations.

Preliminary results from the second part of Chew's study are in Tables 4 and 5. Table 4 shows for recently arrived migrants classified by various entry categories, c_b 's calculated with the ΔQ_j 's of 1971 to 1976. Except for refugees, migrants arriving between 1979 and 1981 have a higher share of their employment in white-collar occupations than those arriving earlier. This is the reason why the c_b 's in Table 4 are generally higher than those in Table 2. About 70 per cent of refugees are labourers. Thus the c_b 's for refugees reflect the small increase from 1971 to 1976 in the share of labourers in the total work force.

The last set of results, those in Table 5, show c_b 's for the various categories of recent arrivals calculated from the same three sets of ORANI projections as underlay Table 3. The results in Table 5 are similar to those in Table 3. Except for refugees, females are shown as gaining relative to males and migrants relative to the Australian-born from each of the three macroeconomic policy changes considered. Refugees lose from the structural effects of increases in wages and absorption. This is because of their very low representation in the white-collar occupations. Increases in protection favour refugees by generating expansions in import-competing activities which are heavy employers of labourers.

Table 4: c's for Recent Arrivals, ^a Classified by Entry Category, Calculated with the Changes in Occupational Shares of 1971 to 1976

Entry category ^b	Female	Male	Persons
Family reunion	5.1	3.1	3.8
General eligibility ^c	5.4	0.6	1.9
Refugees	0.5	0.1	0.2
Special eligibility ^d	5.2	1.6	2.8
Australian-born	3.9	-0.9	0.9

^aThis refers to settler arrivals for the years 1979/80 and 1980/81.
^bThe categories are defined in Committee of Review on Migrant Assessment, Statement of Findings, Department of Immigration and Ethnic Affairs, July 1981, p. 6.
^cGeneral eligibility: This includes all people who do not come within any of the other categories.
^dSpecial eligibility: This is mainly people travelling from New Zealand under the Trans-Tasman Travel Arrangement.
^eThe c's for the Australian-born reflect their occupational characteristics as shown in the 1976 Census.

V CONCLUSION

The work reported in this paper could be improved in a variety of ways. For example, more detailed attention could be given to the possibility discussed in section II that last-on-first-off hiring practices might mean that changes in group shares (ΔS_{ij}) in each occupation are related to changes in occupational shares (ΔQ_j) in total employment. This possibility was examined by Bonnell and Dixon (1982) who found no evidence that any of the birthplace groups was consistently first-off in declining occupations during the period 1971 to 1976. In the other studies listed in Table 1 no work was done on this issue. It might be particularly important for the first part of Chew's study (see section IV) in which migrants are classified by duration of residence. It seems plausible that recently-arrived migrants might be first-off in recession-ary conditions. As well as improvements, numerous extensions could be made to our existing work. Besides birthplace, sex, age, duration of residence and entry category, other classifications for the groups, b, might be educational attainment, location of residence and employment, and occupational status (employer, self-employed, employee and helper). Forces for changes in occupational shares (ΔQ_j) other than changes in world commodity prices, exploitation of mineral resources, changes in protection, increases in real wages and changes in absorption could be

Table 5: c's for Recent Arrivals, ^a Classified by Entry Category, Calculated with the Changes in Occupational Shares Projected by the ORANI Model for Three Macroeconomic Policy Changes

Entry Category ^b	.57% increase in real wages			.45% increase in real absorption			10.6% increase in all protection		
	Females	Males	Persons	Females	Males	Persons	Females	Males	Persons
Family reunion	.07	.01	.03	.11	.05	.08	.15	.03	.07
General eligibility ^c	.16	.00	.05	.23	.06	.11	.13	.07	.08
Refugees	-.12	-.04	-.07	-.11	-.01	-.04	.29	.01	.09
Special eligibility ^d	.14	.00	.05	.19	.06	.10	.12	.03	.06
Australian-born ^e	.06	-.08	-.03	.12	-.02	.03	.05	-.03	-.00

^aThis refers to settler arrivals for the years 1979/80 and 1980/81.

^bThe categories are defined in Committee of Review on Migrant Assessment, Statement of Findings, Department of Immigration and Ethnic Affairs, July 1981, p. 6.

^cGeneral eligibility: This includes all people who do not come within any of the other categories.

^dSpecial eligibility: This is mainly people travelling from New Zealand under the Trans-Tasman Travel Arrangement.

^eThe c's for the Australian-born reflect their occupational characteristics as shown in the 1976 Census.

examined. For instance, an investigation could be made of the incidence across community groups of the adjustment costs associated with anticipated technical changes.

The main conclusion from our various studies is that structural change has only slight differential impacts across broadly defined community groups. With the exception of refugees, for all of the groups studied employment is sufficiently spread across occupations that only very major changes in occupational structure could possibly have large differential impacts. The clearest demonstration of this was by Bonnell and Dixon (1982) who found that groups suffering the greatest disruption from structural change did not have noticeably worse labour market performances than other groups. For recently-arrived refugees there is a concentration of employment in labouring rather than the diversity in occupational attachment found in other groups. Nevertheless, even refugees do not appear to be particularly vulnerable to structural change because labouring jobs are well spread throughout the economy.

REFERENCES

- Bonnell, S.M. (1982), A Preliminary Analysis of the Effects of Changes in the Occupational Structure in Australia on Employment by Sex, 1971-1976. IMPACT Preliminary Working Paper, No. 1P-16, pp. 21. Available from Industries Assistance Commission, Canberra.
- Bonnell, S.M./Dixon, P.B. (1982), The Impact of Structural Change on Employment of Migrants in Australia During the Seventies, in: D. Douglas (ed.), The Economics of Australian Immigration, Proceedings of the Conference on The Economics of Immigration, Sydney, Sydney University Extension Programme, 13-19.
- Chew, T.C. (1981), The Effects of Structural Change in the Australian Economy on the Age and Birthplace Composition of the Workforce, unpublished BEC honours thesis, School of Economics, La Trobe University.
- Chew, T.C. (1983), The Effects of Structural Change in the Australian Economy on Employment Prospects for Groups Classified by Duration of Residence and Entry Status, MEC thesis in preparation, School of Economics, La Trobe University.
- Cook, L.H./Dixon, P.B. (1982), Structural Change and Employment Prospects for Migrants in the Australian Workforce, Australian Economic Papers, 21, 38, 69-84.
- Dixon, P.B./Parmenter, B.R./Powell, A.A. (1982), Farm Incomes in Australia and the Real Exchange Rate: ORANI Simulations with a Back-of-the-Envelope Explanation, IMPACT General Paper No. G-38, pp. 32. Available from Industries Assistance Commission, Canberra.
- Dixon, P.B./Parmenter, B.R./Rimmer, R.J. (1981), Extending the ORANI Model of the Australian Economy: Adding Foreign Investment to a Miniature Version, IMPACT Preliminary Working Paper No. OP-31, pp. 79. Available from Industries Assistance Commission, Canberra.
- Dixon, P.B./Parmenter, B.R./Sutton, J./Vincent, D.P. (1982), ORANI: A Multisectoral Model of the Australian Economy, Amsterdam, North Holland Publishing Company.

Dixon, P.B./Powell, A.A./Parmenter, B.R. (1979), Structural Adaptation in an Ailing Macroeconomy, Melbourne, Melbourne University Press.

Fisher, Norman W.F. (1982), Immigration and Australian Labour Markets: Issues and Evidence, in: D. Douglas (ed.), The Economics of Australian Immigration, Proceedings of the Conference on the Economics of Immigration, Sydney, Sydney University Extension Programme, 21-28.

Gregory, R.G. (1976), Some Implications of the Growth of the Mineral Sector, in: Australian Journal of Agricultural Economics, 20, August, 71-91.

Sheehan, P. (1981), Migrants and the Labour Market: The Impact of Structural Changes in the 1970's and 1980's. Paper presented at the seminar on Structural Change, Immigration and Ethnic Relations held at La Trobe University, mimeo, pp. 22.

Stricker, P./Sheehan, P. (1981), Hidden Unemployment: The Australian Experience, Melbourne, Institute of Applied Economic and Social Research.