

Günçavdi, Öner; Küçükçifçi, Suat; McKay, Andrew D.

Working Paper

Adjustment, stabilisation and the analysis of the employment structure in Turkey: An input-output approach

CREDIT Research Paper, No. 02/24

Provided in Cooperation with:

The University of Nottingham, Centre for Research in Economic Development and International Trade (CREDIT)

Suggested Citation: Günçavdi, Öner; Küçükçifçi, Suat; McKay, Andrew D. (2002) : Adjustment, stabilisation and the analysis of the employment structure in Turkey: An input-output approach, CREDIT Research Paper, No. 02/24, The University of Nottingham, Centre for Research in Economic Development and International Trade (CREDIT), Nottingham

This Version is available at:

<https://hdl.handle.net/10419/81749>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach

by

Öner Günçavdi, Suat Küçükçifçi and Andrew McKay

The Centre for Research in Economic Development and International Trade is based in the School of Economics at the University of Nottingham. It aims to promote research in all aspects of economic development and international trade on both a long term and a short term basis. To this end, CREDIT organises seminar series on Development Economics, acts as a point for collaborative research with other UK and overseas institutions and publishes research papers on topics central to its interests. A list of CREDIT Research Papers is given on the final page of this publication.

Authors who wish to submit a paper for publication should send their manuscript to the Editor of the CREDIT Research Papers, Professor M F Bleaney, at:

Centre for Research in Economic Development and International Trade,
School of Economics,
University of Nottingham,
University Park,
Nottingham, NG7 2RD,
UNITED KINGDOM

Telephone (0115) 951 5620
Fax: (0115) 951 4159

CREDIT Research Papers are distributed free of charge to members of the Centre. Enquiries concerning copies of individual Research Papers or CREDIT membership should be addressed to the CREDIT Secretary at the above address. Papers may also be downloaded from the School of Economics web site at:

www.nottingham.ac.uk/economics/research/credit



Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach

by

Öner Günçavdi, Suat Küçükçifçi and Andrew McKay

The Authors

Öner Günçavdi is Associate Professor and Suat Küçükçifçi is Assistant Professor, both at Istanbul Technical University, and Andrew McKay is Senior Lecturer, School of Economics, University of Nottingham.

Acknowledgements

The authors gratefully acknowledge the comments of Mehmet Odekon, Ertuğrul Tokdemir, Gülay Günlük-Şenesen, Erinç Yeldan and the participants at the *IV. METU International Conference in Economics*, 13-16 September, 2000, Ankara. We however accept sole responsibility for any remaining errors.

Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach

by

Öner Günçavdi, Suat Küçükçifçi and Andrew McKay

Abstract

The aim of the paper is to examine the effects on employment of the large-scale structural adjustment programme undertaken by Turkey from the early 1980s onwards. In this respect, we particularly analyse how appropriate the choices of factor intensity after structural adjustment programme have been in the domestic production in comparison with the availability of domestic factor endowment. Our findings show that foreign trade in intermediate goods creates extra use of domestic labour, which can be considered as the labour cost of importing intermediate goods. This is the case in the majority of industries in the pre- and post-liberalisation period in Turkey. However, the capacity of using extra labour as a result of importing intermediate goods appeared to have decreased in the post-liberalisation period.

Outline

1. Introduction
2. Stabilisation, Structural Adjustment and Employment: Issues and Evidence
3. Methodology
4. Structural Adjustment and Employment Structure in Turkey
5. Conclusion

I. INTRODUCTION

In the inhospitable international setting of the pre-1980 period, Turkish economy pursued an inward-oriented industrialisation strategy, which was supported by high a degree of protectionism. This period was however followed by balance of payment crisis in 1979, which arose basically from the low level of exports and heavy dependence on imported capital goods and raw materials. In order to deal with the crisis, Turkey launched a far-reaching stabilisation and structural adjustment programme in the early 1980s. Due to the dependence of domestic production on imported inputs and the shortage of foreign exchange, Turkey attributed particular importance to trade reform (Baysan and Bilitzer, 1990). An integral part of a large-scale reform programme, the aim of trade reform was to mobilise productive domestic resources towards the fields that Turkey could have comparative advantage in international markets, and could earn foreign exchange. One important result was that the Turkish economy has become more open during the last two decades. For example, in the 1970s, the volume of foreign trade was equivalent to 11 percent of GNP. The same figure increased first to 18 percent in 1980 and then to 43 percent in 1995 (capital and intermediate goods continuing to be the most important items of imports). Turkey still continues to liberalise its foreign trade. A Customs Union was established with the EU in January 1995 as an important step in promoting closer economic integration. It is clear that foreign trade plays an increasingly crucial role in the Turkish economy.

In order to evaluate the success of the reform programme, measuring the factor intensity in production is particularly important in Turkish case. Although Turkey has widely considered as one of the success stories after launching trade reform, there have been few studies examining whether changes in production technology and the structure of foreign trade after the structural adjustment programme took place in according to the expectations of neoclassical theory of comparative advantage. An important question in this respect that has attracted a lot of discussion in Turkey has been how this transformation of the economy has influenced the employment structure.

This paper aims to measure the factor proportion in the Turkish economy, and to see the extent of trade-induced domestic factor savings or costs resulting from the importation of intermediate inputs in production. There have been a number of research to measure

factor intensity and to evaluate the impacts of changes in economic policies on factor proportions in developing countries (e.g. Allauddin and Tisdell, 1988; Sarma and Ram, 1989; Hashim, 1996; and Günlük-Şenesen, 1998). An important feature that distinguishes our analysis here from others is the choice of methodology to measure factor intensity. Our methodology follows Riedel (1975), and takes into account domestic factor savings or costs arising from allowing for the use of imported inputs in production in measuring factor intensity.

The remainder of the paper is organised as follows. In section II we discuss the effects of structural adjustment programmes on employment in developing countries. Section III briefly describes the methodology that we use in measuring labour intensity in domestic production. The Turkish experience with the structural adjustment programme undertaken in the early 1980s and its impacts on employment are empirically examined in section IV. Finally section V sets out our conclusions.

II. STABILISATION, STRUCTURAL ADJUSTMENT AND EMPLOYMENT: ISSUES AND EVIDENCE

The issue of the impact of stabilisation and structural adjustment on employment has been considered in some detail in a review by Toye (1995) and in a multi-country World Bank study by Horton, Kanbur and Mazumdar (1991, 1994). Both studies show how the outcome will vary from case to case. From a conceptual point of view, orthodox stabilisation frequently relies on exchange rate devaluation combined with monetary or fiscal contraction. The aim of this combination of measures is to increase the production of tradable goods in the economy while reducing their consumption, so bringing about external balance and macroeconomic stability without major adverse effects on the non-tradable sector. This package includes both measures, which are likely to have an adverse employment impacts (such as fiscal contraction) and others, which are likely to have favourable, impacts (the incentive to increased production of tradable goods). What the net effect on employment is will then vary from case to case depending on the magnitudes of the different effects. This in turn will depend on various factors including the starting point, the precise policy measures put in place, the characteristics of the tradable and non-tradable sectors, how the labour market operates and the responsiveness of the production sectors to changing incentives (Addison and Demery, 1993; Toye, 1995).

Other policy measures included in structural adjustment are also likely to have significant employment effects including privatisation of previously state owned industries, labour market reform, measures which increase the attractiveness of foreign direct investment and trade liberalisation. The last has attracted a lot of attention in recent years, and is of course particularly relevant to the Turkish case. Concerns are often expressed about the adverse employment and other effects of import-competing industries being exposed to greater international competition. And trade itself may lead to skill-biased technical progress (Wood, 1994), which can be expected to have adverse effects on the employment of unskilled workers. But at the same time trade liberalisation can be expected to have favourable impacts on export or potential export industries, as well as on other industries using imported inputs that benefit from trade liberalisation.

From a conceptual perspective then the overall effect of economic reform on employment is ambiguous. This is borne out by the empirical evidence, which finds adverse employment effects in some instances and favourable effects in others. Toye (1995) for instance contrasts the stabilisation experience of Chile from 1973-79 combined with labour market deregulation (which had adverse effects of employment), with the more gradual reform in Indonesia from 1983-1990 which was associated with favourable employment consequences.

For the present case then, neither theoretical arguments nor the experience of other countries give any clear guidance as to whether the impact of stabilisation and structural adjustment in Turkey will have had favourable or adverse effects on employment. This question needs to be considered empirically.

III. METHODOLOGY

According to Riedel's (1975) methodology, total demand for labour in an open economy consists of two components:

- (i) The demand for labour arising only from domestic production; and
- (ii) The implicit labour demand in earning the foreign exchange with which to purchase the imported inputs required per unit of domestic production.

In this methodology, exports are considered as the only source of earning foreign exchange.

The analysis here is built upon a Leontief input-output model, which is based on the assumptions of fixed input coefficients with constant returns to scale, fixed factor shares in production and perfectly elastic supplies of factors of production. In this model, the labour demand for domestic production is measured as follows.

$$\mathbf{L}^d = \mathbf{E}(\mathbf{I} - \mathbf{A}^d)^{-1} \quad (1)$$

where \mathbf{L}^d is total (direct and indirect) domestic labour demand matrix, \mathbf{E} the diagonal matrix of direct labour requirements, which is given as the ratio of total labour used in a particular sector to total output in that sector, \mathbf{I} the unit matrix, and \mathbf{A}^d domestic input-output coefficient matrix, all with $(n \times n)$ dimension. The labour demand of a unit of domestic production in industry j is calculated from (1) as follows.

$$\mathbf{L}_j^d = \sum_i \mathbf{L}_{ij}^d \quad (2)$$

where \mathbf{L}_j^d is a row vector of total (direct and indirect) domestic demand for labour arising from a unit increase in final demand for output in industry j . Although final demand includes exports in measuring total domestic demand in equation (2), this measure assumes that all intermediate goods are domestically produced. However, in an open economy, foreign trade in intermediate goods must also be considered in measuring the factor requirement of domestic production. This modification of calculation is crucial because importation of intermediate goods can either save or use extra domestic labour in production. In particular, importing labour intensive goods would allow the economy to save domestic labour inputs. The economy must, on the other hand, earn foreign exchange to purchase imported inputs from abroad, and produce more for exports. This production however will require extra use of labour.

Now we calculate total (direct and indirect) imported input requirements for per unit of the domestic commodity j as follows.

$$\mathbf{M}_j^d = \sum_i \mathbf{R}_{ij} \quad (3)$$

where

$$\mathbf{R} = \mathbf{A}^m (\mathbf{I} - \mathbf{A}^d)^{-1}$$

\mathbf{M}_j^d is the row vector of total imported input requirement in domestic production. \mathbf{R} is the inverse of imported input coefficient matrix whose elements are noted by \mathbf{R}_{ij} . \mathbf{R}_{ij} indicates the total imported inputs required by sector i in respond to a unit increase in the final demand in sector j . \mathbf{A}^m is the direct imported input coefficient matrix, whose elements show the direct imported inputs provided by industry i to produce a unit output of industry j . An interesting question that stands out in examining the effects of foreign trade on labour demand, is how much each unit of exports generates factor requirement in domestic production. In order to calculate this effect, we must first measure total (direct and indirect) labour demand in producing a unit of an exported good as follows.

$$L^{Fx} = \mathbf{x}_i \mathbf{L}_j^d \quad (4)$$

where \mathbf{x}_j is a column vector implying the proportionate share of the j^{th} commodity in total exports. Equation (4) yields a constant value. This unit export then requires the use of imported inputs in production by the following amount.

$$M^{Fx} = \mathbf{x}_i \mathbf{M}_j^d \quad (5)$$

In equilibrium, the total foreign exchange requirement to finance imports in equation (5) is provided by export earnings. In order to produce one unit of exported goods, we directly need L^{Fx} units of labour at the last stage of the production chain from equation (4). However, this extra unit of production for exports stimulates an extra use of imported inputs, so that additional foreign exchange is required to finance these imported inputs. Such a foreign exchange requirement of a unit export, measured by equation (5) in equilibrium, leads to an additional rise in the production of exportable goods by M^{Fx} , which in turn requires $L^{Fx} M^{Fx}$ units of extra uses of labour at the second stage of the production chain. And again this extra production of exports requires imported inputs at the second stage of the production chain. And so on. The sum of all

labour requirements in the original production of one unit of exports in the beginning of the production chain can hence be written as follows.

$$L^{Fx} + L^{Fx}M^{Fx} + L^{Fx}(M^{Fx})^2 + L^{Fx}(M^{Fx})^3 + \dots + L^{Fx}(M^{Fx})^n = \frac{L^{Fx}}{1 - M^{Fx}} \quad (6)$$

where $0 \leq M^{Fx} \leq 1$. Using equation (6), total (direct and indirect) additional factor requirements in earning foreign exchange to purchase total imported inputs of the domestic production, \mathbf{M}_j^d can be written as

$$\mathbf{L}_j^m = \left[\frac{L^{Fx}}{1 - M^{Fx}} \right] \mathbf{M}_j^d \quad (7)$$

Equation (7) shows the total (direct and indirect) demands for both factors in earning foreign exchange, which is necessary to finance total (direct and indirect) demand for imported inputs required by domestic production. Total factor requirements of domestic production are then

$$\mathbf{L}_j^T = \mathbf{L}_j^d + \mathbf{L}_j^m \quad (8)$$

The first term on the right hand-side of equation (8) is the labour demand in the domestic production of final and intermediate goods, and is measured by equation (2). The second one is the additional labour demand necessary to generate foreign exchange (through exporting) to purchase imported inputs required per unit domestic production, and measured by equation (7). Equation (8) implies that the labour demand of an economy is determined not only by the production technology, but also by the structure of foreign trade. In this framework, production technology determines both \mathbf{L}_j^d and \mathbf{M}_j^d whereas the structure of foreign trade is influential on the determination of domestic factor savings or costs measured by the terms in the bracket in equation (7). For example, in an open economy where capital intensive intermediate goods are imported and foreign exchange required to finance these imports is earned by exporting labour intensive commodities, it is likely to expect that foreign trade will induce both savings in domestic capital and the more use of domestic labour.

In order to see the effects of foreign trade on employment, we need to measure the labour demand in the case of no foreign trade. In other words, we calculate labour demand by assuming that all intermediate inputs are produced domestically. This is possible to measure by using the following method.

$$L_j = \sum_i L_{ij} \quad (9)$$

where

$$L = E(I - A)^{-1}$$

The measure in equation (8) differs from that in equation (9) that the former allows for the measure of the factor intensity of the exported goods, which are used to purchase intermediate goods not produced domestically. Using these two different measures in equation (8) and (9) we can obtain some economic intuition on the effects on labour demand of allowing for foreign trade. For example, the case where $L_j < L_j^T$ implies that the importation of intermediate inputs in domestic production and the exchange of exported goods to earn the foreign exchange required to purchase these imported inputs increases domestic labour demand in production, *vice versa*.

Price Adjustment Procedure

In order to examine the effects of this change in foreign trade on employment structure of the economy, we need to measure the labour demand created by allowing for imports in intermediate goods both before and after the adjustment, then to compare these figures. However, this type of intertemporal comparison requires us to handle changes in price levels. Using two input-output matrices for different years in current prices, we attempt to adjust coefficient matrices for s based on the base year t ($s > t$) (e.g. see Günlük-Şenesen and Küçükçifçi, 1994).

The deflating procedure involves expressing A_s , the matrix of technical coefficients, in the prices of the year t . We define A_s^t as A_s deflated with year s prices, so that

$$A_s^t = P_s^{-1} A_s P_s \quad (10)$$

where \mathbf{P}_s is the diagonal matrix of industrial price indices capturing changes in price levels from year t to s . From (10), the typical element of \mathbf{A}_s^t is

$$a_{s,ij}^t = \frac{x_{s,ij}}{x_{s,j}} \frac{P_{s,j}}{P_{s,i}} \quad (11)$$

where $P_{s,i}$ and $P_{s,j}$ are changes in industrial price indices of sector i and sector j from year t to year s respectively, and the $(P_{s,j}/P_{s,i})$ term on the right-hand side captures changes in relative prices from year t to year s . In what follows the methodology presented in this section is applied to the Turkish economy in order to examine the employment generation effect of stabilisation and structural adjustment policies in the 1980s.

IV. STRUCTURAL ADJUSTMENT AND EMPLOYMENT STRUCTURE IN TURKEY

Macroeconomic Background

Until the end of the 1970s, the Turkish economy enjoyed a very high growth rate mainly by following a state-led import substitution strategy (see Table 1). In the midst of a severe recession in the world economy, the average growth rate reached about 7 per cent in the period of 1973-76 by implementing unsustainable expansionary economic policies. An inflationary process (as a consequence of these policies), failures to mobilise domestic resources (mostly due to the repressed financial system), the periodic overvaluation of the Turkish Lira and anti-export biases in the trade regime led the economy to encounter severe balance of payment difficulties by 1977 (Celasun and Rodrik, 1989). Despite this inhospitable setting of the pre-1980 period, the economy had grown by approximately 6.3 per cent a year between 1963 and 1973, and 3.7 per cent in the period of 1974-1979 (SPO, 1997: 20). The sustainability of these economic policies undertaken was, however, constrained largely by the availability of foreign exchange. The dependence of the domestic production on imported intermediate and capital goods¹ had been requiring increasingly more foreign exchange by the end of the 1970s, which was partly provided through exporting traditional agricultural commodities

¹ The large majority of Turkish imports consists of intermediate inputs and raw material, and capital goods. The share of imported inputs and capital goods was accounted for almost 90 per cent of total imports in 1950, 95 per cent in 1970 and 90 percent in the period of 1983-1996 in Turkey (see SPO, 1997: 53).

and partly from capital inflows either in the form of remittances from workers living mainly in Germany, or in terms of borrowing with short-term maturity. When the country's balance of payment position worsened, the widely-used means of external adjustment of the period were the use of international reserves (if available), restricting imports through a highly protective trade regime and, when imbalances reached unsustainable levels, sizeable devaluations of the currency.

In the absence of adequate foreign exchange, and with a lack of institutional background allowing domestic resources to be mobilised towards more productive fields, Turkey launched an economic reform programme in 1980, aiming to solve the internal and external disequilibrium problems of the late 1970s. The objective of the reform programme was first to stabilise the economy, and then to adjust the structure of the economy from an inward-oriented strategy towards an export-oriented one (Arıcanlı and Rodrik, 1990; Nas and Odekon, 1992). Recognising the dependence of domestic production on imported inputs and foreign exchange, Turkey liberalised its trade regime. First, the exchange rate regime was changed drastically from a fixed exchange rate system to a more flexible and realistic one with increased reliance on market forces. Various export incentives were launched to increase export earnings, and quantitative controls on imports, such as quotas and a licensing system, were eliminated (Baysan and Blitzer, 1991; Olgun and Togan, 1990). An improvement in the balance of payments was also of great importance to the government to gain creditworthiness that was needed to attract international funds from IMF and the World Bank, and to compensate for the depressed domestic demand by exports. Therefore a gradual import liberalisation was chosen because of worries that a rapid one would cause a deterioration in the balance of payments. With continuous mini devaluation of the Turkish Lira, the government aimed to keep exports competitive in international markets, and so to secure foreign exchange earnings.

Table 1 – Main Macroeconomic Indicators

	1973-76	1977-80	1981-83	1984-88	1989-93	1994-96
	<i>(Period Average in %)</i>					
Real GDP growth rate	7.2	1.3	4.0	5.9	5.2	3.1
Savings/GDP	20.8	17.3	17.3	21.7	21.9	21.4
Investment/GDP	21.4	22.5	18.5	22.3	23.7	23.9
Exports/GDP	3.7	3.3	7.8	11.5	9.1	13.3
Imports/GDP	9.2	8.6	13.7	16.4	14.7	21.1
Total PSBR/GDP ¹	---	6.9	4.1	4.7	9.1	7.6
Main Prices						
Inflation (average in %)	19.2	61.9	56.6	48.5	65.1	93.4
Real exchange rate ² (% average)	-3.9	7.4	12.0	-0.69	-6.45	5.72
Real interest rate (average in %)	-10.7	-43.4	-13.2	2.96	4.66	24.4

¹ PSBR stands for public sector borrowing requirement.

² Calculated as $e(P^*/P)$, where e is the nominal exchange rate, P^* and P are the consumer price indices of the USA and Turkey respectively. Negative numbers indicate the overvaluation of currency, *visa versa*.

As seen in Table 1, the overall growth performance of the economy was quite remarkable over the reform period between 1983 and 1994. Following a 1.3 per cent growth rate in the period of 1977-1980, the economy grew at an annual rate of nearly 5 per cent on average afterwards. The share of exports in GDP rose to approximately 8 per cent in 1981-83 from 3.3 per cent in the period 1977-80, while the share of imports also rose to nearly 14 per cent in the former period from 9 per cent in the 1977-80 period. The resource gap between saving and investment, as a share in GDP, declined from 5.2 per cent in the 1977-80 period, first to 1.2 percent in 1981-83, and then to 0.6 per cent in 1984-1988. Besides, the employment generation capacity of the economy declined in the post-liberalisation period. Total employment grew at annual rate 0.95 percent on average in the period of 1981-82, while it was 2 percent in the period of 1977-79 (see Bulutay, 1995). Although the economy seems to have higher growth rates after these initial years of the liberalisation period, it has never reached to its pre-liberalisation level.

Data

The aim of this section is to examine the effects of a large-scale structural adjustment programme on employment structure in Turkey. In order to do so, we employ two input-output tables showing the different structures of production and foreign trade in Turkey before and after the structural adjustment. The tables of input-output for 1973 and 1990 are used for our purpose. Although another table for 1979 is also available, results based

on this table lack credibility because it was a year of foreign exchange shortages, which caused constraints on the supply side (e.g. see Bilginsoy, 1993).

The input-output tables for Turkey include 64 sectors, but we had to decrease the number of sectors to 24 because price indices were only available at this more aggregated level.² The price indices for the manufacturing industry are wholesale price indices compiled from the State Institute of Statistics (*SIS*) for 1990. The price indices for services are implicit deflator computed from *SIS* data for GNP. All index values are, however, adjusted to the base year 1973 for our purpose. Sectoral employment data in Turkey are collected from different sources, and typically cover *formal* employment figures which are recorded by the *Social Insurance Agency* and the *Civil Servants' Pension Fund* (see also Celasun, 1989 for detail). However the use of informal labour is widespread case in the Turkish economy (see Yeldan 2000, Özar, 1995, Köse and Yeldan 1996 for further discussion). For example, Günlük-Şenesen (1998) estimates that the use of informal labour in 1990 is 98 percent of total employment in agriculture, 44 percent in manufacturing and 48 percent in services. The estimated figures on the use of labour (including formal and informal) in all 24 industries are borrowed from Günlük-Şenesen (1998), and show consistency with the estimates of similar figures in Köse and Yeldan(1996). In addition to the labour intensity of domestic production, calculating capital intensity requires data on capital inputs used in production. However such data is not readily available for the Turkish economy.³

Results

Given the existing structures of production and foreign trade in each year, total sectoral labour demands per billion Turkish Liras (TL) output in the 1973 prices are reported in Table 1. In the first column of each table, we show the factor demand of the economy assuming that all intermediate inputs are produced domestically, which is calculated by equation (9). For example, Alauddin and Tisdell (1988) and Sarma and Ram (1989) used

2 The aggregation of the industries in the original tables is as follows. Agriculture (1-4), Mining (5-10), Food-Beverage (11-19), Textiles (20-24), Wood-Furniture (25-26), Paper-Printing (27-28), Chemicals (29-31), Oil-Refining (32-33), Rubber-Plastics (34-35), Glass-Cement (36-38), Iron-Steel (39-40), Metal Product (41), Machinery (42-43), Electrical-Machinery (44), Transportation-Vehicles (45-48), Other Manufacturing (49), Utilities (50-51), Transportation Service (56-60), Banking (61), Personal Services (62), Public Services (63), Housing (64). Figures in brackets indicate the number of sectors in original tables.

3 Köse and Yeldan (1996) report estimated sectoral capital stock data only for 1990.

this measure in calculating the factor proportions of industries in Bangladesh and India respectively. The second column indicates factor requirements of producing final and domestic intermediate goods in each sector, as measured by equation (2). This is the measure of factor intensity, which has previously been used by other studies for Turkey (Günlük-Şenesen, 1998). The total additional factor requirements in earning foreign exchange to purchase the total imported inputs of domestic production in each table are given by equation (7), and reported in the third column. The total (direct and indirect) factor requirement, including the additional demand for labour necessary to produce the goods that are exchanged for the imported intermediate goods, are given in the fourth column of the table. And finally, the difference between factor requirements under two alternative production structures (one without any imported inputs, the other allowing for imported intermediate goods, measured by equation (8)), appears in the fifth column. Positive figures in this column can be considered as domestic factor savings, while negative ones are factor costs of one extra unit of exports produced for the purpose of earning foreign exchange required to purchase imported intermediate inputs that are necessary for the given structure of production.

As seen in Table 2, foreign trade – the exchange of exports for imported intermediate inputs in domestic production – creates extra demand for labour. This is the case in all industries with the structures of domestic production and foreign trade in 1973. We reach the same conclusion for the majority of industries in 1990 (Table 2b with the exceptions of three industries, namely *agriculture*, *food* and *textiles*.⁴ More precisely, the production of a unit of an export good for earning foreign exchange required to purchase imported inputs in the domestic production in these three industries appear to save from the use of labour in the domestic economy. This result suggests that these three industries have possibly been exchanging their relatively capital-intensive outputs for the labour-intensive imported inputs.

Table 2a
Total Labour Requirement per Billion TL Output in the Turkish Economy

1973		L_j	L_j^d	L_j^m	L_j^T	$(L_j - L_j^T)$	L_j / L_j^T
1	<i>Agriculture</i>	109,005	108,112	1,696	109,809	-0,804	0,993
2	<i>Mining</i>	39,729	37,737	2,926	40,664	-0,935	0,977

⁴ This figure is zero for the public service sector in both years. This is because this industry produces non-tradeable goods for the domestic economy.

3	<i>Food</i>	68,843	67,589	1,875	69,464	-0,621	0,991
4	<i>Textile</i>	54,353	51,648	3,926	55,573	-1,220	0,978
5	<i>Wood</i>	54,749	52,965	2,484	55,449	-0,700	0,987
6	<i>Paper</i>	33,735	30,501	5,459	35,960	-2,225	0,938
7	<i>Chemicals</i>	22,570	17,861	9,570	27,431	-4,861	0,823
8	<i>Petroleum</i>	15,980	7,394	11,130	18,523	-2,543	0,863
9	<i>Rubber and Plastic</i>	36,693	25,909	13,148	39,057	-2,364	0,939
10	<i>Glass and Cement</i>	31,162	28,875	3,835	32,710	-1,548	0,953
11	<i>Basic Metal</i>	25,471	20,552	9,008	29,559	-4,088	0,862
12	<i>Metal Products</i>	29,649	24,527	9,659	34,186	-4,537	0,867
13	<i>Machinery</i>	22,462	17,956	9,249	27,205	-4,743	0,826
14	<i>Electrical Machinery</i>	25,687	19,856	11,160	31,016	-5,329	0,828
15	<i>Transport Vehicle</i>	23,931	19,105	9,561	28,666	-4,736	0,835
16	<i>Other Manufacturing</i>	28,045	23,094	7,973	31,067	-3,022	0,903
17	<i>Electric, Gas, Water</i>	12,743	11,122	2,379	13,501	-0,758	0,944
18	<i>Construction</i>	39,470	36,947	4,554	41,501	-2,031	0,951
19	<i>Trade</i>	27,607	27,167	0,543	27,710	-0,102	0,996
20	<i>Transport-com</i>	21,900	19,551	3,425	22,976	-1,077	0,953
21	<i>Banking</i>	13,324	13,078	0,437	13,515	-0,191	0,986
22	<i>Personal Services</i>	52,185	51,471	1,237	52,708	-0,523	0,990
23	<i>Public Services.</i>	20,802	20,802	0,000	20,802	0,000	1,000
24	<i>Housing</i>	12,091	11,928	0,268	12,196	-0,106	0,991

Table 2b
Total Labour Requirement per Billion TL Output in the Turkish Economy

	L_j	L_j^d	L_j^m	L_j^T	$(L_j - L_j^T)$	L_j/L_j^T
1990 (in 1973 prices)						
1 <i>Agriculture</i>	43,165	42,315	0,797	43,112	0,053	1,001
2 <i>Mining</i>	18,884	18,045	1,090	19,135	-0,251	0,987
3 <i>Food</i>	25,987	23,423	1,959	25,382	0,606	1,024
4 <i>Textile</i>	27,623	25,035	2,382	27,417	0,206	1,008
5 <i>Wood</i>	21,036	19,633	1,490	21,123	-0,088	0,996
6 <i>Paper</i>	21,114	17,195	4,330	21,524	-0,411	0,981
7 <i>Chemicals</i>	12,980	9,241	5,522	14,763	-1,784	0,879
8 <i>Petroleum</i>	17,116	3,138	15,852	18,990	-1,874	0,901
9 <i>Rubber and Plastic</i>	13,286	8,189	5,260	13,450	-0,164	0,988
10 <i>Glass and Cement</i>	21,613	19,152	2,984	22,136	-0,523	0,976
11 <i>Basic Metal</i>	12,468	8,229	6,572	14,802	-2,333	0,842
12 <i>Metal Products</i>	14,272	11,193	4,682	15,874	-1,603	0,899
13 <i>Machinery</i>	13,991	11,247	4,169	15,416	-1,425	0,908
14 <i>Electrical Machinery</i>	11,286	8,042	5,506	13,549	-2,263	0,833
15 <i>Transport Vehicle</i>	15,172	12,727	3,549	16,277	-1,105	0,932
16 <i>Other Manufacturing</i>	15,364	5,838	15,929	21,768	-6,403	0,706
17 <i>Electric, Gas, Water</i>	7,943	7,273	0,916	8,190	-0,247	0,970
18 <i>Construction</i>	16,878	14,963	2,753	17,715	-0,837	0,953
19 <i>Trade</i>	19,124	18,490	0,686	19,175	-0,051	0,997
20 <i>Transport-com</i>	10,917	9,094	2,245	11,339	-0,422	0,963
21 <i>Banking</i>	24,441	24,028	0,536	24,565	-0,124	0,995
22 <i>Personal Services</i>	39,324	37,689	2,561	40,250	-0,926	0,977
23 <i>Public Services.</i>	13,304	13,304	0,000	13,304	0,000	1,000
24 <i>Housing</i>	1,274	1,180	0,133	1,313	-0,039	0,970

Source: The calculation of authors based upon SIS (1973) and (1990), *The Input-Output Structure of the Turkish Economy*, Ankara: State Institute of Statistics.

In order to see the changes in the extent of creating labour demand, we obtain the ratio of two measures of labour demand, rather than their difference as seen in fifth column, and shown in the column six. Any figures below unity indicate the presence of extra demand for labour arising from earning foreign exchange (through exporting) which is required to purchase imported inputs. Figures above unity, on the other hand, imply saving in labour as a result of allowing foreign trade. Figure 1 is based on the results of the column six. The industry numbers are displayed on the horizontal axis whereas the ratios in the sixth column are on the vertical axis. The horizontal line passing through one is the point where foreign trade does not create any extra net labour demand. In other words, the labour intensities of domestic production measured with and without imported inputs (by equation (9) and (8)) are equal ($i.e. L_j^m = 0$). What it tells us is how much additional labour demand is created by foreign trade, which becomes less as the unit line is approached. More precisely, the production for earning foreign exchange in this industry requires less labour in exchange of imported intermediate goods.

The labour intensities of foreign trade in both years are shown in Figure 1. The horizontal-small lines indicate the values in 1973, while those in 1990 are shown by triangles. The distance between these two calculated values tells whether the *net employment generating effects* of foreign trade have increased or decreased between these two years. As seen in the figure, the ratio in the column six becomes smaller for most of the industries in Table 2 from 1973 to 1990, indicating that foreign trade stimulates less use of labour in domestic production after the post-liberalisation era. In industries like *basic metal*, *other manufacturing*, *personal services* and *housing*, on the other hand, extra demand for labour for the exchange of exports for imported intermediate goods appear to increase in the same era.

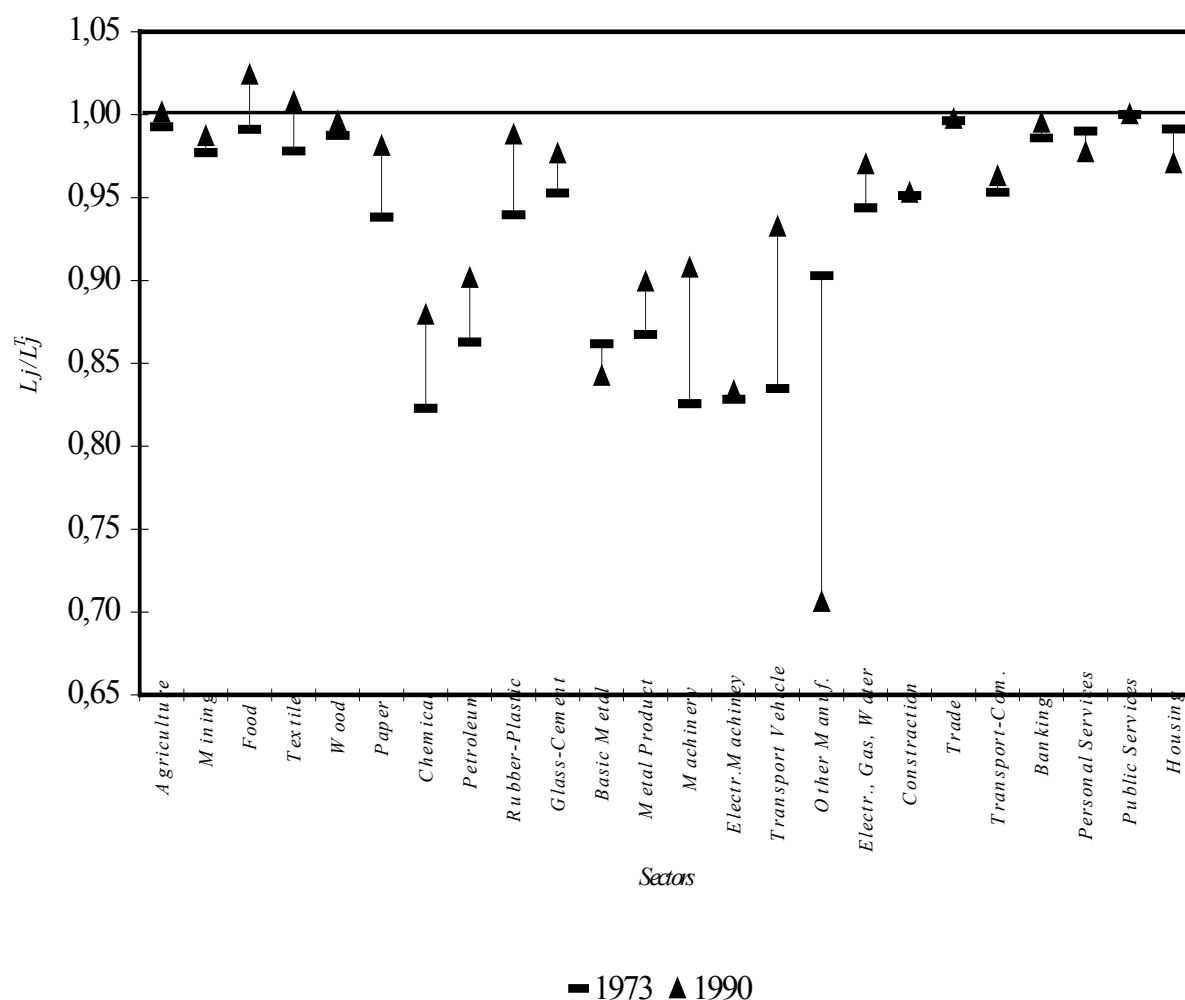


Figure 1 *Employment Generation Effects of Structural Adjustment Programme from 1973 to 1990*

Our empirical analysis shows that openness to foreign trade in intermediate goods results in the extra use of labour in the majority of industries in Turkey. This employment generation effects of foreign trade imply that the domestic production exchanges relatively labour-intensive exported goods with relatively less labour-intensive imported intermediates. However, this ability of creating extra use of labour, as a result of allowing for the importation of intermediates, appears to have declined in the post-liberalisation era.

V. CONCLUSION

This paper examined the effects of the Turkish structural adjustment programme undertaken in the 1980s on the employment structure. There exist similar research using input-output models (Allaiddin and Tisdell, 1988, Sarma and Ram, 1989, Hashim, 1996 and Günlük-Şenesen, 1998). However, they have widely ignored the presence of imported intermediate inputs in domestic production so their results lack credibility. Therefore their calculation may have under- or over- estimated the labour intensity of industries. In this study, we draw attention to these biases in the measures of labour intensity, and showed a more appropriate measure that takes into account the presence of imported intermediate inputs in domestic production.

This new measure was applied for Turkey. Using two input-output tables for the pre- and post-stabilisation eras, we calculated labour demand of the Turkish industries and analysed the changes in labour demand. Our findings showed that foreign trade in intermediate goods creates extra use of domestic labour, which can be considered as the labour cost of importing intermediate goods. This is the case in the majority of industries in the pre- and post-liberalisation period in Turkey. However, the capacity of using extra labour as a result of importing intermediate goods appeared to have decreased in the post-liberalisation period.

REFERENCES

- Addison, T. and L. Demery (1993), "Labour Markets, Poverty and Adjustment", *Journal of International Development*, Vol. 5, No. 2.
- Alauddin, M, and C. Tisdell (1988), "The Use of Input-Output Analysis to Determine the Appropriateness of Technology and Industries: Evidence from Bangladesh", *Economic Development and Cultural Change* **36** (2): 369-391.
- Arıcanlı, T. and D. Rodrik (1990), *The Political Economy of Turkey: Debt, Adjustment and Sustainability*, (London: MacMillan Press).
- Baysan, T. and C. Blitzer (1990), "Turkey's Trade Liberalisation in the 1980s and Prospects for its Sustainability", in T. Arıcanlı and D. Rodrik (eds.): 9-36.
- Bilginsoy, C. (1993), "Inflation, growth, and import bottlenecks in the Turkish manufacturing industry", *Journal of Development Economics* **42**: 111-131.
- Bulmer-Thomas, V. (1982), *Input-Output Analysis in Developing Countries*, (New York: Wiley).
- Bulutay, T. (1995), *Employment, Unemployment and Wages in Turkey*, State Institute of Statistics and International Labour Organisation, Ankara.
- Celasun, M., (1989), "Income Distribution and Employment Aspects of Turkey's post 1980 Adjustment", *METU Studies on Development* **16** (3-4): 1-31.
- Celasun, M. and D. Rodrik (1989), "Debt, Adjustment and Growth: Turkey", in J.D. Sachs and S.M. Collins (eds.), *Developing Country Debt and Economic Performance: Country Studies-Indonesia, Korea, Philippines, Turkey*, (Chicago: The university of Chicago Press).
- Günlük-Şenesen, G. (1998), "An Input-Output Analysis of Employment Structure in Turkey: 1973-1990", *Economic Research Forum Conference for Arab Countries, Iran and Turkey Working Paper 9809, Cairo*.
- Günlük-Şenesen, G and S. Küçükçifçi (1994), "Decomposition of Structural Change into Technology and Price Components: Turkey, 1973/1985", *Economic Systems Research* **6** (2): 199-215.
- Hashim, S.R. (1996), "Growth, Technology and Employment", in R.K. Koti *et al.* (ed.): 167-195.
- Horton, S., R. Kanbur and D. Mazumdar (1991), "Labour markets in an era of adjustment – evidence from 12 developing countries", *International Labour Review*, Vol. 130, No. 5-6.

- Horton, S., R. Kanbur and D. Mazumdar, eds (1994), *Labour markets in an era of adjustment*, two volumes, World Bank, Washington D.C.
- Koti, R.K., P. Venkatramaiah, R. Radhakrishna, and S.R. Hashim (1996), *Studies in Indian Economy*, (Bombay: Himalaya Publishing House).
- Köse, H. A. and E. Yeldan (1996), “Türkiye Ekonomisinde Sektörel İşgücü İstihdamı ve Ücret Yapısı Üzerine Bir Deneme” (On Sectoral Employment and Wage Structure in the Turkish Economy), *Mimeo.*, Bilkent University, Department of Economics, Ankara.
- Özar, Ş. (1995), “The Informal Sector in Turkey”, paper presented at ERF Conference, December 1-3, 1995, Aswan, Egypt.
- Riedel, J. (1975), “Factor Proportions, Linkages, and the Open Developing Economy”, *Review of Economic and Statistics* **57** (4): 487-494; also in I. Sohn (ed.): 340-349.
- Sarma, A. and K. Ram (1989), “Income, Output and Employment Linkages and Import Intensities of Manufacturing Industries in India”, *Journal of Development Studies* **25** (2): 192-209.
- SIS (1996), *The Input-Output Structure of the Turkish Economy in 1990*, State Institute of Statistics, Ankara.
- SIS (1996), *Statistical Indicators (1923-1995)*, State Institute of Statistics, Ankara.
- SPO (1997), *Economic and Social Indicators (1950-1997)*, State Planning Organisation, Ankara.
- Sohn, I. (1995), *Readings in Input-Output Analysis*, (New York: Oxford University Press).
- Stone, R. and J.A.C. Brown (1965), *Exploring 1970: Some Numerical Results*, Vol: 6 in *A Programme for Growth*, Department of Applied Economics and Chapman and Hall, June.
- Toye, J. (1995), *Structural Adjustment and Employment Policy: Issues and Experience*, International Labour Office, Geneva.
- Yeldan. E. (2000), “The Impact of Financial Liberalisation and the Rise of Financial Rents on Income Inequality: The Case of Turkey”, Working Papers No. 206, The United Nations University, *World Institute for Development Economics Research (WIDER)*, November.
- Wood, A. (1994), *North-South Trade, Employment and Inequality*, Oxford: Clarendon Press.

CREDIT PAPERS

- 00/1 **Robert Lensink**, “Does Financial Development Mitigate Negative Effects of Policy Uncertainty on Economic Growth?”
- 00/2 **Oliver Morrissey**, “Investment and Competition Policy in Developing Countries: Implications of and for the WTO”
- 00/3 **Jo-Ann Crawford and Sam Laird**, “Regional Trade Agreements and the WTO”
- 00/4 **Sam Laird**, “Multilateral Market Access Negotiations in Goods and Services”
- 00/5 **Sam Laird**, “The WTO Agenda and the Developing Countries”
- 00/6 **Josaphat P. Kweka and Oliver Morrissey**, “Government Spending and Economic Growth in Tanzania, 1965-1996”
- 00/7 **Henrik Hansen and Fin Tarp**, “Aid and Growth Regressions”
- 00/8 **Andrew McKay, Chris Milner and Oliver Morrissey**, “The Trade and Welfare Effects of a Regional Economic Partnership Agreement”
- 00/9 **Mark McGillivray and Oliver Morrissey**, “Aid Illusion and Public Sector Fiscal Behaviour”
- 00/10 **C.W. Morgan**, “Commodity Futures Markets in LDCs: A Review and Prospects”
- 00/11 **Michael Bleaney and Akira Nishiyama**, “Explaining Growth: A Contest between Models”
- 00/12 **Christophe Muller**, “Do Agricultural Outputs of Autarkic Peasants Affect Their Health and Nutrition? Evidence from Rwanda”
- 00/13 **Paula K. Lorgelly**, “Are There Gender-Separate Human Capital Effects on Growth? A Review of the Recent Empirical Literature”
- 00/14 **Stephen Knowles and Arlene Garces**, “Measuring Government Intervention and Estimating its Effect on Output: With Reference to the High Performing Asian Economies”
- 00/15 **I. Dasgupta, R. Palmer-Jones and A. Parikh**, “Between Cultures and Markets: An Eclectic Analysis of Juvenile Gender Ratios in India”
- 00/16 **Sam Laird**, “Dolphins, Turtles, Mad Cows and Butterflies – A Look at the Multilateral Trading System in the 21st Century”
- 00/17 **Carl-Johan Dalgaard and Henrik Hansen**, “On Aid, Growth, and Good Policies”
- 01/01 **Tim Lloyd, Oliver Morrissey and Robert Osei**, “Aid, Exports and Growth in Ghana”
- 01/02 **Christophe Muller**, “Relative Poverty from the Perspective of Social Class: Evidence from The Netherlands”
- 01/03 **Stephen Knowles**, “Inequality and Economic Growth: The Empirical Relationship Reconsidered in the Light of Comparable Data”
- 01/04 **A. Cuadros, V. Orts and M.T. Alguacil**, “Openness and Growth: Re-Examining Foreign Direct Investment and Output Linkages in Latin America”
- 01/05 **Harold Alderman, Simon Appleton, Lawrence Haddad, Lina Song and Yisehac Yohannes**, “Reducing Child Malnutrition: How Far Does Income Growth Take Us?”

- 01/06 **Robert Lensink and Oliver Morrissey**, “Foreign Direct Investment: Flows, Volatility and Growth”
- 01/07 **Adam Blake, Andrew McKay and Oliver Morrissey**, “The Impact on Uganda of Agricultural Trade Liberalisation”
- 01/08 **R. Quentin Grafton, Stephen Knowles and P. Dorian Owen**, “Social Divergence and Economic Performance”
- 01/09 **David Byrne and Eric Strobl**, “Defining Unemployment in Developing Countries: The Case of Trinidad and Tobago”
- 01/10 **Holger Görg and Eric Strobl**, “The Incidence of Visible Underemployment: Evidence for Trinidad and Tobago”
- 01/11 **Abbi Mamo Kedir**, “Some Issues in Using Unit Values as Prices in the Estimation of Own-Price Elasticities: Evidence from Urban Ethiopia”
- 01/12 **Eric Strobl and Frank Walsh**, “Minimum Wages and Compliance: The Case of Trinidad and Tobago”
- 01/13 **Mark McGillivray and Oliver Morrissey**, “A Review of Evidence on the Fiscal Effects of Aid”
- 01/14 **Tim Lloyd, Oliver Morrissey and Robert Osei**, “Problems with Pooling in Panel Data Analysis for Developing Countries: The Case of Aid and Trade Relationships”
- 01/15 **Oliver Morrissey**, “Pro-Poor Conditionality for Aid and Debt Relief in East Africa”
- 01/16 **Zdenek Drabek and Sam Laird**, “Can Trade Policy help Mobilize Financial Resources for Economic Development?”
- 01/17 **Michael Bleaney and Lisenda Lisenda**, “Monetary Policy After Financial Liberalisation: A Central Bank Reaction Function for Botswana”
- 01/18 **Holger Görg and Eric Strobl**, “Relative Wages, Openness and Skill-Biased Technological Change in Ghana”
- 01/19 **Dirk Willem te Velde and Oliver Morrissey**, “Foreign Ownership and Wages: Evidence from Five African Countries”
- 01/20 **Suleiman Abrar**, “Duality, Choice of Functional Form and Peasant Supply Response in Ethiopia”
- 01/21 **John Rand and Finn Tarp**, “Business Cycles in Developing Countries: Are They Different?”
- 01/22 **Simon Appleton**, “Education, Incomes and Poverty in Uganda in the 1990s”
- 02/01 **Eric Strobl and Robert Thornton**, “Do Large Employers Pay More in Developing Countries? The Case of Five African Countries”
- 02/02 **Mark McGillivray and J. Ram Pillarisetti**, “International Inequality in Human Development, Real Income and Gender-related Development”
- 02/03 **Sourafel Girma and Abbi M. Kedir**, “When Does Food Stop Being a Luxury? Evidence from Quadratic Engel Curves with Measurement Error”
- 02/04 **Indraneel Dasgupta and Ravi Kanbur**, “Class, Community, Inequality”
- 02/05 **Karuna Gomanee, Sourafel Girma and Oliver Morrissey**, “Aid and Growth in Sub-Saharan Africa: Accounting for Transmission Mechanisms”
- 02/06 **Michael Bleaney and Marco Gunderman**, “Stabilisations, Crises and the “Exit” Problem – A Theoretical Model”

- 02/07 **Eric Strobl and Frank Walsh**, “Getting It Right: Employment Subsidy or Minimum Wage? Evidence from Trinidad and Tobago”
- 02/08 **Carl-Johan Dalgaard, Henrik Hansen and Finn Tarp**, “On the Empirics of Foreign Aid and Growth”
- 02/09 **Teresa Alguacil, Ana Cuadros and Vincente Orts**, “Does Saving Really Matter for Growth? Mexico (1970-2000)”
- 02/10 **Simon Feeny and Mark McGillivray**, “Modelling Inter-temporal Aid Allocation”
- 02/11 **Mark McGillivray**, “Aid, Economic Reform and Public Sector Fiscal Behaviour in Developing Countries”
- 02/12 **Indraneel Dasgupta and Ravi Kanbur**, “How Workers Get Poor *Because* Capitalists Get Rich: A General Equilibrium Model of Labor Supply, Community, and the Class Distribution of Income”
- 02/13 **Lucian Cernat, Sam Laird and Alessandro Turrini**, “How Important are Market Access Issues for Developing Countries in the Doha Agenda?”
- 02/14 **Ravi Kanbur**, “Education, Empowerment and Gender Inequalities”
- 02/15 **Eric Strobl**, “Is Education Used as a Signaling Device for Productivity in Developing Countries?”
- 02/16 **Suleiman Abrar, Oliver Morrissey and Tony Rayner**, “Supply Response of Peasant Farmers in Ethiopia”
- 02/17 **Stephen Knowles**, “Does Social Capital Affect Foreign Aid Allocations?”
- 02/18 **Dirk Willem te Velde and Oliver Morrissey**, “Spatial Inequality for Manufacturing Wages in Five African Countries”
- 02/19 **Jennifer Mbabazi, Oliver Morrissey and Chris Milner**, “The Fragility of the Evidence on Inequality, Trade Liberalisation, Growth and Poverty”
- 02/20 **Robert Osei, Oliver Morrissey and Robert Lensink**, “The Volatility of Capital Inflows: Measures and Trends for Developing Countries”
- 02/21 **Miyuki Shibata and Oliver Morrissey**, “Private Capital Inflows and Macroeconomic Stability in Sub-Saharan African Countries”
- 02/22 **L. Alan Winters, Neil McCulloch and Andrew McKay**, “Trade Liberalisation and Poverty: The Empirical Evidence”
- 02/23 **Oliver Morrissey**, “British Aid Policy Since 1997: Is DFID the Standard Bearer for Donors?”
- 02/24 **Öner Günçavdi, Suat Küçükçifçi and Andrew McKay**, “Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach”

SCHOOL OF ECONOMICS DISCUSSION PAPERS

In addition to the CREDIT series of research papers the School of Economics produces a discussion paper series dealing with more general aspects of economics. Below is a list of recent titles published in this series.

- 00/1 **Tae-Hwan Kim and Christophe Muller**, “Two-Stage Quantile Regression”
- 00/2 **Spiros Bougheas, Panicos O. Demetridis and Edgar L.W. Morgenroth**, “International Aspects of Public Infrastructure Investment”
- 00/3 **Michael Bleaney**, “Inflation as Taxation: Theory and Evidence”
- 00/4 **Michael Bleaney**, “Financial Fragility and Currency Crises”
- 00/5 **Sourafel Girma**, “A Quasi-Differencing Approach to Dynamic Modelling from a Time Series of Independent Cross Sections”
- 00/6 **Spiros Bougheas and Paul Downward**, “The Economics of Professional Sports Leagues: A Bargaining Approach”
- 00/7 **Marta Aloi, Hans Jørgen Jacobsen and Teresa Lloyd-Braga**, “Endogenous Business Cycles and Stabilization Policies”
- 00/8 **A. Ghoshray, T.A. Lloyd and A.J. Rayner**, “EU Wheat Prices and its Relation with Other Major Wheat Export Prices”
- 00/9 **Christophe Muller**, “Transient-Seasonal and Chronic Poverty of Peasants: Evidence from Rwanda”
- 00/10 **Gwendolyn C. Morrison**, “Embedding and Substitution in Willingness to Pay”
- 00/11 **Claudio Zoli**, “Inverse Sequential Stochastic Dominance: Rank-Dependent Welfare, Deprivation and Poverty Measurement”
- 00/12 **Tae-Hwan Kim, Stephen Leybourne and Paul Newbold**, “Unit Root Tests With a Break in Variance”
- 00/13 **Tae-Hwan Kim, Stephen Leybourne and Paul Newbold**, “Asymptotic Mean Squared Forecast Error When an Autoregression With Linear Trend is Fitted to Data Generated by an I(0) or I(1) Process”
- 00/14 **Michelle Haynes and Steve Thompson**, “The Productivity Impact of IT Deployment: An Empirical Evaluation of ATM Introduction”
- 00/15 **Michelle Haynes, Steve Thompson and Mike Wright**, “The Determinants of Corporate Divestment in the UK”
- 00/16 **John Beath, Robert Owen, Joanna Poyago-Theotoky and David Ulph**, “Optimal Incentives for Incoming Generations within Universities”
- 00/17 **S. McCorriston, C. W. Morgan and A. J. Rayner**, “Price Transmission: The Interaction Between Firm Behaviour and Returns to Scale”
- 00/18 **Tae-Hwan Kim, Douglas Stone and Halbert White**, “Asymptotic and Bayesian Confidence Intervals for Sharpe Style Weights”
- 00/19 **Tae-Hwan Kim and Halbert White**, “James-Stein Type Estimators in Large Samples with Application to the Least Absolute Deviation Estimator”
- 00/20 **Gwendolyn C. Morrison**, “Expected Utility and the Endowment Effect: Some Experimental Results”
- 00/21 **Christophe Muller**, “Price Index Distribution and Utilitarian Social Evaluation Functions”

- 00/22 **Michael Bleaney**, “Investor Sentiment, Discounts and Returns on Closed-End Funds”
- 00/23 **Richard Cornes and Roger Hartley**, “Joint Production Games and Share Functions”
- 00/24 **Joanna Poyago-Theotoky**, “Voluntary Approaches, Emission Taxation and the Organization of Environmental R&D”
- 00/25 **Michael Bleaney, Norman Gemmell and Richard Kneller**, “Testing the Endogenous Growth Model: Public Expenditure, Taxation and Growth Over the Long-Run”
- 00/26 **Michael Bleaney and Marco Gundermann**, “Credibility Gains and Output Losses: A Model of Exchange Rate Anchors”
- 00/27 **Indraneel Dasgupta**, “Gender Biased Redistribution and Intra-Household Distribution”
- 00/28 **Richard Cornes and Roger Hartley**, “Rentseeking by Players with Constant Absolute Risk Aversion”
- 00/29 **S.J. Leybourne, P. Newbold, D. Vougas and T. Kim**, “A Direct Test for Cointegration Between a Pair of Time Series”
- 00/30 **Claudio Zoli**, “Inverse Stochastic Dominance, Inequality Measurement and Gini Indices”
- 01/01 **Spiros Bougeas**, “Optimism, Education, and Industrial Development”
- 01/02 **Tae-Hwan Kim and Paul Newbold**, “Unit Root Tests Based on Inequality-Restricted Estimators”
- 01/03 **Christophe Muller**, “Defining Poverty Lines as a Fraction of Central Tendency”
- 01/04 **Claudio Piga and Joanna Poyago-Theotoky**, “Shall We Meet Halfway? Endogenous Spillovers and Locational Choice”
- 01/05 **Ilias Skamnelos**, “Sunspot Panics, Information-Based Bank Runs and Suspension of Deposit Convertibility”
- 01/06 **Spiros Bougeas and Yannis Georgellis**, “Apprenticeship Training, Earnings Profiles and Labour Turnover: Theory and German Evidence”
- 01/07 **M.J. Andrews, S. Bradley and R. Upward**, “Employer Search, Vacancy Duration and Skill Shortages”
- 01/08 **Marta Aloï and Laurence Lasselle**, “Growing Through Subsidies”
- 01/09 **Marta Aloï and Huw D. Dixon**, “Entry Dynamics, Capacity Utilisation, and Productivity in a Dynamic Open Economy”
- 01/10 **Richard Cornes and Roger Hartley**, “Asymmetric Contests with General Technologies”
- 01/11 **Richard Cornes and Roger Hartley**, “Disguised Aggregative Games”
- 01/12 **Spiros Bougeas and Tim Worrall**, “Cost Padding in Regulated Monopolies”
- 10/13 **Alan Duncan, Gillian Paull and Jayne Taylor**, “Price and Quality in the UK Childcare Market”
- 01/14 **John Creedy and Alan Duncan**, “Aggregating Labour Supply and Feedback Effects in Microsimulation”

Members of the Centre

Director

Oliver Morrissey - aid policy, trade and agriculture

Research Fellows (Internal)

Simon Appleton – poverty, education, household economics

Adam Blake – CGE models of low-income countries

Mike Bleaney - growth, international macroeconomics

Indraneel Dasgupta – development theory, household bargaining

Norman Gemmell – growth and public sector issues

Ken Ingersent - agricultural trade

Tim Lloyd – agricultural commodity markets

Andrew McKay - poverty, peasant households, agriculture

Chris Milner - trade and development

Wyn Morgan - futures markets, commodity markets

Christophe Muller – poverty, household panel econometrics

Tony Rayner - agricultural policy and trade

Research Fellows (External)

David Fielding (*University of Leicester*) – investment, monetary and fiscal policy

Ravi Kanbur (*Cornell*) – inequality, public goods – Visiting Research Fellow

Henrik Hansen (*University of Copenhagen*) – aid and growth

Stephen Knowles (*University of Otago*) – inequality and growth

Sam Laird (*UNCTAD*) – trade policy, WTO

Robert Lensink (*University of Groningen*) – aid, investment, macroeconomics

Scott McDonald (*University of Sheffield*) – CGE modelling, agriculture

Mark McGillivray (*WIDER, Helsinki*) – aid allocation, aid policy

Doug Nelson (*Tulane University*) - political economy of trade

Shelton Nicholls (*University of West Indies*) – trade, integration

Eric Strobl (*University of Louvain*) – labour markets

Finn Tarp (*University of Copenhagen*) – aid, CGE modelling