

Tricks & Trips: Foreign Investment and Knowledge Transfer revisited

Sir Arthur Lewis Memorial Lecture

Castries, St. Lucia, January 25, 2002

NORMAN GIRVAN¹

INTRODUCTORY REMARKS

It is customary on these occasions to speak of the honour felt at delivering a lecture in memory of a great man. Yet I can say so with sincerity; for Sir Arthur was indeed an icon to my generation. Like the “3 Ws” and Sir Garfield Sobers in cricket, CLR James in politics, Norman Manley in law and Dr. Eric Williams in history, he was a leading member of a band of West Indian pioneers that shattered colonial assumptions of racial inadequacy by their brilliance combined with a consistent commitment to excellence. In so doing he inspired pride and a collective belief in ourselves.

Sir Arthur was appointed Principal of the University College of the West Indies the same year that I left school and faced a decision whether to study economics at a Canadian University, where I had been offered a place, or at the University College of the West Indies, where I had been offered a scholarship. When I heard that this famous St. Lucian economist, the first West Indian in so many accomplishments, was coming home to head the UCWI, that helped to make up my mind. The three years I spent on the Mona Campus during the Lewis era were among the most memorable of my life; forging a deep sense of Caribbean identity that set me off on the personal and professional trajectory of the past 40 years. I was very happy indeed when, in 1999, I was able to play a significant part in the naming of the Sir Arthur Lewis Institute of Social and Economic Studies at the University of the West Indies, the result of a merger of the former Institute of Social and Economic Research with the Consortium Graduate School of Social Sciences. On that occasion we were honoured with the presence of Gladys Lady Lewis, as indeed we are this evening.

Of course, at one stage of his career Sir Arthur was also strongly criticised by my generation of economists. He never allowed this to bother him, maintaining always his grace and good humour. I well remember the last occasion on which I saw him, when he was being honoured at the Annual Conference of the Caribbean Studies Association in Barbados in 1989. He listened for over two hours with a bemused expression to the tributes being heaped upon, including some

¹ Secretary General, Association of Caribbean States and Professor of Development Studies, University of the West Indies. This is a slightly edited version of the lecture as delivered. The views expressed are not the official views of any institution with which I am associated. Mail: ngirvan@acs-aec.org

by his erstwhile critics. When he finally took the stage, it was to tell an anecdote. This famous Senator, he said, was always being bitterly attacked by one of his opponents who had never met him personally. When the Senator finally met his critic, he enquired as to the reason for the vitriolic attacks. “Well”, said the critic, “you are so famous and so many people say so many good things about you, I figured there must be something wrong with you”. Sir Arthur, of course, had the last laugh!

In any case there is nothing wrong with criticism *per se*, for no one is infallible and polemic is part of the cut and thrust of academic and policy debate. But I have to say that most of the criticisms of the “Lewis model of Industrialisation by Invitation” were unjustified, in the sense that many of the policies carried out in Lewis’s name were not those that he espoused. For instance, he proposed a West Indian Customs Union as an integral part of his industrialisation strategy, but that never happened. He also pointed to the limitations of the domestic market and proposed export oriented industrialisation; instead, Governments practiced national import substitution.

Conditions also changed from those in 1949-1950 when he wrote his famous articles on West Indian industrialisation and Lewis was often the first to point this out and to suggest new policies. For instance in the 1960s he pointed to the emergence of a high wage economy, argued that this was a factor in the persistence of unemployment and proposed an incomes policy to keep labour costs competitive. This did not make him popular at the time; but today the country with one of the most successful incomes policies, Barbados, is also one of the best performing economies in the English speaking Caribbean.

TRICKS OF THE TRADE

It is not the employment aspect of the Lewis industrialisation strategy that I wish to discuss tonight, but another aspect that is sometimes overlooked. This is the transfer of technical knowledge and entrepreneurship to local people that he believed foreign investment would bring about. In a widely quoted passage taken from his famous article on the Industrialisation of the British West Indies, Sir Arthur made the following argument:

..... foreign capital is much less dangerous in manufacturing industry than it is in agriculture or in mining. The effect of bringing in foreign capital is to increase the national income, and, if the local people are thrifty, they can build up savings which in due course enable them, *having learnt the tricks of the trade*, to set up in the business themselves. They cannot do this in agriculture or in mining if all the local natural resources have been signed away, unless they can persuade the foreigners to sell—and foreigners tend to be clannish, and refuse to sell. But in manufacturing industry there is no such barrier. Once the local people have learnt the job and have built up their own savings, they can go right in. There is thus much less danger to the sovereignty of a people from the influx of foreign capital into manufacturing industry than there is from its entrenchment in land or in mining. (Lewis 1950: Para. 115; emphasis added)².

² Reprinted in Vol. II of his Collected Papers, pp. 872-873

In other words, Sir Arthur believed that knowledge could and would be transmitted relatively smoothly from foreigners to locals, that there would be no significant barriers to the entry of local capitalists in manufacturing, and that local technological innovation would proceed on the basis of local entrepreneurship. In this lecture I will use the idea of “learning the tricks of the trade” as a metaphor for these three inter-related processes: knowledge transfer, growth of local entrepreneurship, and local innovation (although admittedly, these processes are far more complex than the phrase implies). I shall be reviewing some of the evidence on the contribution of foreign investment to these processes, and pointing to the influence of the regulatory environment and the implications of the WTO in this context.

I should begin by observing that there is universal acceptance among economists of the crucial importance of knowledge transfer and innovation in economic growth. Sir Arthur himself was no stranger to the subject, as shown by his extensive treatment of it in his magisterial work *The Theory of Economic Growth*. More recent statistical research attributes upwards of two-thirds of the growth of productivity in developed countries over several decades in the 20th century, to the effects of improved technology and technological learning. So the role and contribution of “the tricks of the trade” to economic development are, if anything, of even greater importance than suggested in the passage quoted.

FOREIGN INVESTMENT IN THE CARIBBEAN

Next, let us trace in broad outline the evolution of policies towards foreign investment in the English speaking Caribbean since Lewis. The 1950s and the 1960s were the heyday of foreign investment promotion, using incentives such as tax holidays, subsidised loans and factory space, and tariff protection. The 1970s were the decade of economic nationalism, with nationalisations and localisations of foreign owned companies in many industries. Since the early 1980s the policy pendulum has swung back in favour of foreign investment as a result of the privatisation and liberalisation policies promoted by the international financial institutions and with the incorporation of intellectual property and investment within the scope of the World Trade Organisation (WTO) Treaty.

For example, a Caribbean Trade and Investment Report published by CARICOM in 2000 observed, “member states have over time made considerable policy changes to create a conducive and enabling environment for foreign investment”³. It cites a study on the Comparative Attractiveness of Investment Locations prepared by the British firm Matthew Stamp PLC and based on professional judgments and the perceptions of investor opinion, which graded investment locations in 8 areas: (i) market access to the USA and EEC; (ii) political stability; (iii) security; (iv) domestic infrastructure (utilities); (v) international transport links; (vi) investment incentives; (vii) free zone incentives; and (viii) English language compatibility. The results rank the English speaking Caribbean as a whole on par with Southeast Asia, and ahead of East Asia. Within the region the highest scores are by Barbados, St. Kitts and Nevis and Antigua and Barbuda⁴.

³ CARICOM 2000, p. 219

⁴ CARICOM 2000 Report, Table VII.14, p.218. St. Lucia is not graded in the report.

Another indication of the favourable investment climate in the region is the relatively high level of stocks and flows of foreign investment in recent years. During the 1990s the English speaking Caribbean received US\$10,673 million of foreign direct investment. Energy projects in Trinidad and Tobago were the single largest recipient of these flows (US\$4,335 million, 41%), but there were also significant inflows to tourism, manufacturing, telecommunications, financial services, information processing, agriculture and mining; and these were spread fairly well over all the member states⁵.

Relative to its size the English speaking Caribbean does very well in attracting foreign investment vis-à-vis the rest of the developing world. In 1997 the contribution of foreign direct investment to total gross capital formation averaged 28 percent for 13 CARICOM economies compared to an average 16 percent for Latin America and the Caribbean and 10 percent for the developing world (Table VII.12, p.216). In the same year the ratio of the stock of FDI to annual GDP for 11 CARICOM countries averaged 70 percent compared to 17 percent for Latin America and the Caribbean and the same figure for the developing world (Table VII.11, p. 215).

KNOWLEDGE TRANSFER

So that on the whole the region does not have a problem with the attraction of investment inflows. The issue for us here is how far they lead to the transfer of knowledge and entrepreneurship, the “tricks of the trade”. We have had some 50 years of experience since Lewis made his famous prognosis on this, an experience that covers many countries and many industries, and our research knowledge in this area is very uneven, with large gaps. This makes it misleading to attempt to generalise from particular cases. The experiences of St. Lucia and Antigua in tourism could be quite different because of differences in the host environment; and the experience of tourism on the whole will certainly be different from that of natural gas because of differences in the scale of capital and the kind of technology used.

Let me give some examples. In the mid-1970s I was the coordinator of a research project on the transfer of technology and the development of indigenous technological capabilities in CARICOM countries that covered several sectors and involved researchers who were scientists and engineers as well as economists. It was found that in the oil and bauxite industries, the foreign-owned companies did quite well in developing operating skills among local people in the production operations. Where the problem lay was in the downstream capabilities associated with the long term development of these industries—like planning, strategic marketing, process technology, product development and project engineering⁶. These activities tend to be carried out by the parent companies in their home countries. Locals hardly get exposed to them; and there is no question of forming local companies to take over these operations because of the industries are vertically integrated nature and the foreign multinational companies control the downstream operations. The role of local companies is confined to being subcontractors in the construction of infrastructure and the supply of goods and services. The situation in the sugar industry is similar

⁵ The data in this and the following paragraph are taken from the CARICOM 2000 Report, Table VII.11 and VII.12; pp. 215-216

⁶ See Farrell (1979) for an insightful treatment of the petroleum industry of Trinidad and Tobago

in some respects—for example the parent firms carry out strategic marketing and product development.

This is fairly consistent with the picture Lewis painted back in 1950s. Foreign control over technology and marketing is one reason why, when some Caribbean governments nationalised or localised mining and export agriculture industries, they usually ended up asking the old owners to come back to run the operations or to provide vital services.

Let us turn to the situation in manufacturing industry. The research found that locally owned firms were strongly involved in manufacturing production using technology supplied by foreign multinational firms in sectors such as pharmaceuticals, consumer goods, machinery and equipment, chemical products, recording, and printing and publishing. The normal practice was that the local firm would enter into a contractual arrangement with a foreign supplier for the use of machinery and equipment, process know-how, product specifications, trademarks and brand names, technical assistance and marketing techniques. In principle this provided opportunities for the management and staff of the local firm to engage in technological learning and eventually to do without foreign technology.

The problem was that the terms of the technology contracts did not provide these opportunities, or severely limited them. Many of the clauses were designed to prolong the dependence on the foreign supplier, to restrict adaptation, assimilation and diffusion of the imported technology. This was the situation in Trinidad and Tobago and Guyana, as found by Maurice Odle, and in Jamaica, where the study was done by Owen Arthur (now Prime Minister of Barbados)⁷. For example of 71 agreements in Jamaica, 67 percent had secrecy and confidentiality clauses, 65 percent had obligations not to use technology after the expiry of the agreement, and 15 percent had grant back provisions obliging the recipient to hand over technology improvements to the licensor (Arthur 1985: 216).

If you think about it this makes good business sense from the foreign supplier's point of view, for it is the proprietary technology and trade secrets that that is the source of his profit. The local firm didn't mind too much, for it was producing for a protected market and was assured of its extra profit. Both sides were happy. But this gave import substitution a bad name, for the local consumer suffered and industry never developed its own technology and export dynamism.

This situation was by no means unique to the Caribbean. It was typical of most developing countries and indeed typical of the practices of multinational firms that license technology, whether to developing or other developed countries. As a result during the 1970s many developing countries began to pass laws and regulations to regulate the terms of technology contracts to prohibit these restrictive clauses and to require firms to do more to pass on the foreign technology to local firms. India, Brazil, the Andean Community, and the Republic of Korea were among the countries that did this. (CARICOM never got around to doing this because the Community never adopted common policy on foreign investment although there was a proposal on the table to this effect for several years). The developing countries also pushed strongly for an International Code of Conduct on Technology Transfer under the auspices of the

⁷ Odle 1985; and Arthur 1985

United Nations Conference of Trade and Development UNCTAD that would limit restrictive practices and oblige firms to transfer technology.

Something else of interest was also happening at this time. Firms in several developing countries were succeeding in using their relationships with multinational firms as a means of accessing and ultimately mastering foreign technology--in learning the tricks of the trade, as it were. This was happening in South Korea in textiles and garments, textile machinery, automobiles, shipbuilding, and electronics; in India in heavy equipment and machinery; in Singapore in software engineering; and in Brazil in petrochemicals. These success stories all tended to have certain features in common. First, there was usually a conscious government policy to push domestic firms to use their agreements with foreign firms to assimilate foreign technology. Sometimes this was done through the regulatory environment and sometimes by means of tax incentives and financial assistance. Governments also invested substantially in technological educations and training so that domestic firms would have an abundant supply of skilled manpower on which to draw.

The second feature common to the success stories was the presence of aggressive, technologically minded management within the successful firms. These managers consciously strived to ensure that their firms assimilated foreign technology and engaged in technological learning. They saw this as an integral element in their business strategy and a key objective of the relationship with their foreign partner. They invested in training for technical and professional staff and in adaptive research and development.

There are success stories from the Caribbean too, and management attitudes always turn out to be a critical success factor. In the 1980s I studied a Jamaican firm manufacturing welding electrodes, which had mastered the production technology originally acquired from its foreign suppliers and improved on it by means of conscious strategies for the assimilation of process know-how, the adaptation of manufacturing equipment and the modification of formulations for the specifications of electrodes⁸. The strategies paid off in terms of profitability and competitiveness, as the firm acquired its sole competitor on the domestic market.

On the whole, some progress was being made in the developing world up to the end of the 1970s. But the whole climate changed in the 1980s. Most of the developing world was afflicted by a foreign debt crisis and the effects of the economic slowdown in the world economy. Countries became desperate for foreign currency. The international financial institutions stepped in and told them that if they wanted loans they would have to liberalise their investment laws and regulations, lower their import tariffs, abolish import controls and generally allow foreign and local firms a free rein. The effort to introduce an UNCTAD International Code of Conduct on Technology Transfer was abandoned. And the developed countries, led by the United States, began a drive to introduce technology into the terms of the General Agreement on Tariffs and Trade (GATT) agreement in the form of Trade Related Intellectual Property Rights—TRIPS. This was the Uruguay Round that resulted in the establishment of the World Trade Organisation WTO in 1994.

⁸ See article by Girvan and Marcelle (1990)

WTO AND TRIPS

The TRIPS agreement came against the background of the emergence of technology a key factor in national competitiveness and economic performance. Intellectual property rights (IPRs) are one of the principal ways in which the results of R&D are exploited. IPRs are patents, copyrights and related rights, trademarks, geographical indications, industrial designs, layout designs of integrated circuits and trade secrets. These are important sources of competitive advantage for firms in industries that are research and development intensive, such as chemicals, drugs, plastics, engines, turbines, electronics, industrial control and scientific equipment; or where marketing relies on brand names and product recognition, such as food and beverages; where copyright is key, such as publishing, software, music and film; and design intensive industries like clothing and automobiles.

What TRIPS does is to set detailed minimum standards for the protection of intellectual property rights with which all members of the WTO are required to bring their national legislation and treatment into conformity. In patents, one of the key areas, the freedom that previously existed for countries to determine the areas of non-patentability, the duration of patents and the set of exclusive rights conferred by patents have all been removed and replaced with universal provisions. The minimum life of a patent is fixed at 20 years, patents are to be granted without regard to the place of invention, the kind of technology or whether the product is to be produced locally or imported.

Similarly, geographical indications that were previously protected only by a small number of countries must now be recognised by all countries. Copyright protection for 50 years has been extended to software and data compilations and rental rights for music, films and computer programmes; on pain of criminal proceedings and prescribed penalties for copyright piracy. Protection of trademarks has been harmonised and strengthened. Industrial designs are to be protected for a minimum of 10 years.

There are three effects of the TRIPS agreement that are now seen to be of particular concern to developing countries. The first is the general, overarching concern about access to technology. The theory behind providing universal minimum standards of protection is that people will have an incentive to spend money on research and development of new products and processes because of the assurance they will be able to make returns on their investment. The reality is that R&D in technology intensive industries requires vast sums of money and most of it is carried out by large multinational firms and very little by developing country firms. For example, the average cost of developing a new pharmaceutical compound is said to be US\$200 million. Developed countries carry out some 74 percent of world R&D expenditures and firms based in these countries own the vast majority of the world's patents.

The heightened standards of protection afforded by TRIPS reinforce the technologically dominant positions of these firms and reduce the pressure on them to share technology. For instance, it has been noted that in 1995 80 percent of technology transfers by US firms were made to their own subsidiaries abroad compared with 69 percent in 1985⁹. Nonetheless

⁹ Stillwell and Monagle 2000, p. 2

developing countries should learn to use IPRs more aggressively to protect their own cultural products and geographical indications, such as rum, reggae, soca, and Carnival.

The second concern relates specifically to pharmaceuticals and public health. Prior to TRIPS developing countries like Brazil, India and Egypt had refused to recognise many patents for pharmaceutical formulations that are essential to public health, and encouraged local firms to manufacture generic substitutes for branded medicines at a fraction of the cost. With TRIPS, these countries are now being required to change their laws to recognise the patents held by pharmaceutical firms. There is some room to manoeuvre, because TRIPS allows compulsory licensing of patents that are essential for public health and nutrition. Compulsory licensing allows a government to authorise the use of a patent for these purposes under certain conditions, including the payment of reasonable compensation.

However, the difficulties of using the TRIPS Agreement for this purpose are shown by the experience of South Africa when it tried to access cheap anti-AIDS medications. South Africa has one of the highest incidences of AIDS in the world, with over 10 percent of the population HIV positive. Patented drugs are available to slow the advance of AIDS, at a cost to the individual patient of US\$10,000-\$15,000 per year. Cheaper generic substitutes can be manufactured, for example in India, at one-hundredth of the cost. In 1997 the South African government passed a law to allow the cheaper drugs to be imported and/or manufactured on the grounds of a national health emergency. The Pharmaceutical Association and a group of 39 international drug companies immediately challenged its legality, citing the TRIPS agreement. The South African government, AIDS activists and NGOs mounted a huge international campaign and eventually, faced with much adverse publicity, the drug companies dropped their opposition to the Act in April 2001. In the ensuing four years there were over 300,000 AIDS-related deaths in South Africa.

Now contrast this with what happened during the recent anthrax scare in the United States. The patent for the leading antidote to anthrax, known as Cipro, is held by the Bayer Company, which markets the drug at a relatively high price. Within a matter of days after the first confirmed case of anthrax infection, the Bush Administration faced enormous pressure to grant compulsory licenses to other companies for the manufacture of generic Cipro. Within weeks, Bayer had agreed to halve the price of Cipro to the government in the interest of public health. There were, I think, five anthrax-related deaths in the US during the recent scare.

During the recent WTO Ministerial Meeting at Doha, pressure from the developing countries resulted in the Doha declaration on TRIPS and Public Health¹⁰ that significantly clarified the right of members to grant compulsory licenses on the grounds of national emergency. The problem for small developing countries like those in the Caribbean (which has the highest incidence of AIDS in the world after sub-Saharan Africa) is that most of them lack a domestic pharmaceutical industry with the capability to use compulsory licensing. They would need to engage on so-called “parallel importing”, making special arrangements with countries like India and Cuba. And the provisions for parallel importing are not spelt out in the Declaration. So developing countries still have to do a great deal of technical work and hard political bargaining within the TRIPS Council in order to make use of the declaration.

¹⁰ See WTO (2001)

Third, a notable aspect of the TRIPS agreement is the extension of protection to plants and plant varieties. Developing countries possess most of the world's biodiversity and are the source of genetic resources, for example medicinal plants, of great value for agriculture and industry. But they lack the financial and technological resources needed to develop and commercialise their plant varieties. In the past 20 years a small number of firms have secured dominance in agricultural biotechnology using the new science of genetic engineering. By now the top 10 global companies in the pharmaceutical, seed and agrochemical markets account for 36 percent, 40 percent and 82 percent respectively in their respective global markets¹¹. There is now the possibility that such firms could genetically modify plant varieties originating in developing countries, take out patents on them and substitute them for the original varieties, in effect appropriating ownership over the products of their genetic resources.

The TRIPS agreement allows protection to be based both on the *sui generis* systems traditionally prevailing in developing countries, or on patents, or on a combination of both. If the developing countries are coerced—or conned—into accepting the patenting of plant varieties or even living organisms, this could have a number of negative consequences; for example prohibition of re-use of saved seeds by farmers; not allowing breeding based on protected varieties, extension of monopoly rights over important crops, and increased concentration of farm ownership and in the seeds industry. The recommended strategy here is for the developing countries to develop and institutionalise their own *sui generis* systems of plant protection, in order to guarantee farmers rights for the re-use of seeds and the breeding of new varieties.

On balance, then, TRIPS has reduced the scope for learning “the tricks of the trade”; but it has by no means eliminated the opportunities entirely. The developing countries were pressured into accepting TRIPS as part of the WTO as a result of the changed balance of power following the debt crisis and the neo-liberal policies of the Reagan-Thatcher era. There was also the threat of unilateral action to restrict the market access of developing countries, especially under the Super 301 US legislation. Finally, there were generous promises of the benefits that would flow from expanded trade and investment under the WTO.

Many of these have failed to materialise, and in the run-up to the 4th WTO Ministerial at Doha the developing countries found a renewed determination to resist the pressure for a new round of trade liberalization negotiations until the implementation issues outstanding from the Uruguay Round were resolved to their satisfaction. One result of this was the Declaration on TRIPS and public health. Another was the agreement that negotiations on new issues will be launched at the 5th Ministerial only on the basis of explicit consensus. The English speaking Caribbean played major role, as part of the developing world, in bringing about this result. Over the next two years, much political determination and technical negotiating skill will be needed to ensure that the modest concessions secured in Doha are turned into specific implementable provisions.

CONCLUSION

Let us remember, though, that laws and regulations only help to create an enabling environment. I mentioned that two of the features common to success stories in the developing world were a

¹¹ See the article by Stillwell and Monagle (2000), p. 4; citing RAFI, *The Gene Giants: Update on Consolidation in the Life Industry*, 1999

supportive government and aggressive, technological oriented management of domestic firms. Mastering the tricks of the trade require these no less than it needs more favourable conditions for the international flow of technology.

Half a century ago Sir Arthur Lewis expressed a mixture of pessimism and hope in the final paragraph of the Industrialisation of the British West Indies:

.where is the drive to come from? A visit to the British West Indian Islands at the moment is a depressing experience. Everyone seems to be waiting for something to happen, but the traveller is never quire able to discover what it is that they are waiting for. Some key is needed to open the door behind which the dynamic energies of the West Indian people are at present confined. The key has obviously been found in Puerto Rico, where the drive and enthusiasm of a people hitherto as lethargic as the British West Indians warms the heart and inspires confidence in the future. The British West Indians can solve their problems if they set to them with a will. But first they must find the secret that will put hope, initiative, direction and an unconquerable will into the management of their affairs. And that is the hardest task of all¹².

In the half-century since Sir Arthur wrote this there have been ups and downs, advances and reversals, but progress has been undeniable. And underlying this and everything else he wrote about the region is his confidence in the innate capacities of the West Indian people. We can no better honour the memory of this great West Indian, than by justifying the confidence that he placed in us.

¹² Lewis (1950); Para. 153; p. 891 in his Collected Papers

REFERENCES

Arthur, Owen S. 1985

Commercialisation of Technology and Dependence in Jamaica. In Maurice A. Odle and Owen S. Arthur, *Commercialisation of Technology and Dependence in the Caribbean*. Mona: Institute of Social and Economic Research, University of the West Indies, Caribbean Technology Policy Studies Project.

CARICOM Secretariat 2000

Caribbean Trade and Investment Report 2000: Dynamic Interface of Regionalism and Globalisation. Kingston: Ian Randle Publishers

Contractor, Farok J. 1981

International Technology Licensing: Compensation, Costs and Negotiation. Lexington, Mass.: Lexington Books.

Farrell, T.M.A. 1979

"A tale of two issues: nationalization, the transfer of technology and the petroleum transnationals in Trinidad and Tobago", *Social and Economic Studies*, March. Mona: Institute of Social and Economic Research, University of the West Indies.

Girvan, Norman and Gillian Marcelle 1990

"Overcoming Technological Dependency: The Case of Electric Arc (Jamaica) Ltd., A Small National Firm in a Small Developing Country", *World Development*, 18, 1 January 1990.

Lewis, W. A. 1950

The Industrialisation of the British West Indies. *Caribbean Economic Review*, Vol. 2, No. 1, pp. 1-51. Port of Spain: Caribbean Commission. Reprinted in *Sir William Arthur Lewis: Collected Papers 1941 - 1988. Volume II*. Pp. 824-899. Edited by Patrick Emmanuel. Cave Hill, UWI: Institute of Social and Economic Research, 1994.

Odle, Maurice A. 1985

Commercialisation of Technology and Dependence in Guyana and Trinidad. In Maurice A. Odle and Owen S. Arthur, *Commercialisation of Technology and Dependence in the Caribbean*. Mona: Institute of Social and Economic Research, University of the West Indies, Caribbean Technology Policy Studies Project.

Stilwell, Matthew and Catherine Monagle 2000

Review of TRIPS Agreement Under Article 71.1. South Centre: <http://www.southcentre.org/publications/occasional/paper03-02.htm>

South Centre 1997

The TRIPS Agreement. A Guide for the South. The Uruguay Round Agreement on Trade -Related Intellectual Property Rights. <http://www.southcentre.org/publications/trips/toc.htm>

WTO 2001

Declaration On The Trips Agreement And Public Health.

http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm