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FEATURES

TIPS Executive Director: Stephen Hanival
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Technology in Aid of Development

In this edition of the Trade & Industry Monitor, we focus on various aspects of economic development – high-technology product trade performance; whether technology usage facilitates goods and services exports; lessons on successful poverty reduction efforts; and how constructive partnerships between governments, civil action groups and other parties can assist development efforts.

In our first article, Philip Alves and David Kaplan of the University of Cape Town examine the technological composition of SA exports and our trade performance against both developed and developing countries.

They find that much of SA's relative success has been in scale- and capital-intensive medium-technology products with low incremental output/labour ratios, while the country is struggling to upgrade into more technologically complex, dynamic products.

They also suggest that the East Asian newly industrialised country model – with its strong focus on technology policy – provides planners with important pointers for engineering a graduation into more technology-intensive products. Furthermore they note that it should not be overlooked that some high-technology products, such as electronic components, at least initially, generate significant low-skilled 'assembly-line' types of employment.

A World Bank Policy Research Working Paper by George R. G. Clarke and Scott J. Wallsten looks at the question of whether – if the Internet has made it easier for firms to enter new markets by reducing communication and search costs – it may also have made it easier to export goods and services.

They find that developing countries with higher Internet penetration export more to high-income countries than developing countries where penetration is lower – but that such countries do not appear to export more to other developing countries. However, they argue that these results make intuitive sense: because Internet access is less common in developing countries than in developed countries, being connected to the Internet would seem to be a greater advantage for enterprises in developing countries with respect to exporting to countries where their counterparts are likely to have access.

The analysis further suggests that regulatory policies affecting telecommunications and Internet development indirectly affect trade, further emphasising the importance of deregulating potentially competitive services in the telecommunications industry.

This Monitor also includes a report-back by the EU-LDC Network on the Shanghai Conference on poverty alleviation, held from 25-27 May, which identified practical measures to accelerate growth and progress in poverty reduction. Making the discussion particularly relevant was the fact that most of these real-life experiences of how countries and institutions have scaled up poverty reduction efforts came from practitioners and experts from the developing world.

Our World Trade Watch this quarter looks at the most important outcomes of UNCTAD XI, held from 13-18 June in São Paulo. One of the sub-themes of UNCTAD XI – the Partnership for Development – was addressed by the conclusion that such partnerships should be based on facilitating the relationship and consultation between civil society and governments, and the co-management of joint programmes so that constructive engagement can take place.

UNCTAD Member States also renewed their commitment to improving the coherence between the international monetary, financial and trading systems to enhance their capacities to address the needs of development better.

Our Annual Forum in October this year, which takes the form of an international conference and is held in conjunction with the DPRU and Cornell University, will endeavour to address these very pertinent issues of development and poverty reduction – specifically in the African context.

Furthermore, TIPS is involved in the third of a series of international conferences, to be held in September and organised by the Centre on Regulation and Competition (University of Manchester) and the School of Public Management and Planning (University of Stellenbosch), which will focus on issues, policies and practices around pro-poor regulation and competition.

SA's Declining Export Shares: The Developing Country Challenge

Philip Alves[1] and **David E. Kaplan**[2] find that over the last decade, SA exports have underachieved relative to the world across most of the technology spectrum. The country's trade performance relative to developing countries, both in aggregate and in every technology category, has been particularly poor. Since low- and medium-technology goods tend to use labour more intensively, this has strong negative implications for employment. So SA faces the dual challenge of improving upon current aggregate export performance and upgrading into more technologically complex, dynamic sectors that undoubtedly provide the most growth potential.

The March 2004 edition of the *Trade & Industry Monitor's* Special Focus section[3] on SA's presence in key traded product markets showed that SA has an insignificant share of global trade in dynamic products. Dynamic products are defined as those that have shown the most significant recent increases in their shares of total world trade – strengthening SA's presence in these markets is an unequivocal policy priority.

Many dynamic products are technology- and/or knowledge-intensive. Being competitive in their production requires high rates of innovation and a good research and development platform (UNCTAD[4], 2003). For a variety of reasons related to history and (human) resource endowments, many middle-income countries do not possess these essentials in any great abundance. Consequently, high-technology goods comprise a relatively small share of overall activity.

Given SA's resource abundance, it might be argued that being competitive in resource-based, low- and medium-technology manufactures, or even in the very low value-added primary products sector, can be sufficient to offset the costs of underperforming in high-technology, dynamic trade. Furthermore, from an analytical standpoint, a narrow focus on high-technology products may not be the fairest way to assess SA's relative competencies – studying exports across the entire technology spectrum provides a more balanced picture.

However, the uncomfortable reality is that over the last 10 or so years, SA's exports have underachieved relative to the world across most of the technology spectrum. SA's export performance relative to the developing countries, both in aggregate and in *every* technology category, has been particularly poor. Since low- and medium-technology goods tend to use labour more intensively, this has strong negative implications for employment. SA thus faces the dual challenge of improving upon current aggregate export performance and upgrading into more technologically complex, dynamic sectors that undoubtedly provide the most growth potential.

Table 1: The Technological Classification of Exports

Classification	Examples
Primary Products	Fresh fruit, meat, rice, cocoa, tea, coffee, wood, coal, crude petroleum, gas
Manufactured Products	
Resource-based manufactures	
RB1: Agro/forest-based products	Prepared meats/fruits, beverages, wood products, vegetable oils
RB2: Other resource-based products	Ore concentrates, petroleum/rubber products, cement, cut gems, glass
Low-technology manufactures	
LT1: 'Fashion cluster'	Textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods
LT2: Other low technology	Pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products
Medium-technology manufactures	
MT1: Automotive products	Passenger vehicles and parts, commercial vehicles, motorcycles and parts
MT2: Process industries	Synthetic fibres, chemicals and paints, fertilisers, plastics, iron, pipes/tubes
MT3: Engineering industries	Engines, motors, industrial machinery, pumps, switchgear, ships, watches
High-technology manufactures	
HT1: Electronics and electrical products	Office/data processing/telecommunications equipment, TVs, transistors, turbines, power generating equipment
HT2: Other high technology	Pharmaceuticals, aerospace, optical/measuring instruments, cameras
Other Transactions	Electricity, cinema film, printed matter, 'special' transactions, gold, art, coins, pets

[Source: Lall (2000a)]

Classifying Exports by Technological Complexity

The analysis here uses Sanjaya Lall's (2000a, 2001) technology classifications, which are presented in Table 1. As is clear, the main distinction is drawn between primary products and manufactures. The latter are then broken down into the four technology categories: resource-based (RB), low-tech (LT), medium-tech (MT) and high-tech (HT), each made up of smaller sub-groups. This system uses SITC[5] three-digit (rev. 2) codes, which classify primarily according to activity, and at the three-digit level cover 265 products or product groups. If measured by the number of items in each category, MT is by far the largest with 58. However, if measured by export earnings, HT, with only 18 items, is rapidly becoming the most important category in world trade.

Complete descriptions of each of these categories can be found in an appendix to this paper[6]. Other classification schemas include the OECD's[7] Science, Technology and Industry Scoreboard (2003), and the US Census Bureau's list of Advanced Technology

[1] UCT MPhil candidate

[2] Allan Gray Professor of Business Government Relations at the Graduate School of Business, and Professor of Economics at the University of Cape Town.

[3] Please visit http://www.tips.org.za/research/monitor.asp for an electronic copy of this edition of the Monitor.

[4] United Nations Conference on Trade and Development

[5] Standard International Trade Classification

[6] Please visit http://www.tips.org.za/research/monitor.asp *for an electronic version of this paper containing the appendix*

Products (ATPs). The latter, which is constructed at the HS 10-digit level of disaggregation, is by far the most detailed and accurate. However, it is confined to HT products only, making it inappropriate for the discussion here.

The OECD system classifies exports using ISIC[8] two-digit (rev. 3) codes (manufacturing sectors 15 through 37), with the occasional 'within-sector' exclusions provided for at the three- and four-digit levels. Lall's system is preferred because it provides for greater sectoral disaggregation, and thus a finer division of products into each category. Furthermore, the OECD method does not address primary products and RB manufactures – two categories of utmost importance to SA and most industrialising and developing economies.

Table 2: Growth Rates by Technology Category, 1992-2002 (annual average %)

Products	World	Developing Countries	China	South Africa
All Sectors	4.93	10.54	14.75	4.44
Primary Products	4.02	5.42	6.37	2.16
Total Manufactures	5.08	11.65	15.57	5.14
Resource based	4.40	8.22	12.25	2.66
Low technology	3.67	9.06	11.33	2.37
Medium technology	4.65	13.55	17.47	9.37
High technology	7.56	18.85	27.96	8.64

[Source: COMTRADE and own calculations
Note: 'All Sectors' is not the average of its two major divisions, 'primary products' and 'total manufactures', because of the inclusion of the so-called 'other transactions' in the 'All Sectors' group.]

Growth Rates

Between 1980 and 2000, growth in world exports of manufactures has averaged almost three times the growth in manufacturing value added, or MVA (7.6% and 2.6% respectively). For developing countries taken as a group, the difference is similarly large, with export growth averaging 12% and manufacturing value added only 5.4% (Lall, 2003). Global trade has therefore far outweighed domestic markets in driving manufacturing growth (Kaplan, 2004).

However, there has been considerable divergence within the group of developing countries. Much of the growth in manufactured exports has occurred in the East Asian NICs[9]. Overall, the East Asian NICs now account for 75% of the world's manufactured exports, and a massive 90% of the HT category (UNCTAD, 2003). Other middle-income industrialising countries, in Latin America in particular, have enjoyed far lower manufactured export growth rates. Some of the larger economies like Brazil and Argentina, for example, have seen essentially no increase in their share of world exports or in their share of world MVA (Kozul-Wright and Rayment, 2004: Table 2).

Turning to SA's comparative performance, the data[10] for the period 1992 to 2002 reveal a record broadly similar to that of the Latin American countries, but with a steeper fall in global and developing country export share. SA's exports grew less rapidly than world exports in aggregate and in most technological categories (see Table 2). The exceptions were MT products, where SA's exports grew twice as fast, and HT, where the country's export growth rate marginally exceeded the global growth rate. On balance, however, and considering the significant liberalisation and restructuring the SA economy has experienced since 1994, this record does not seem terribly unsatisfactory.

However, when seen against the backdrop of other developing countries, SA's performance has been particularly weak. In aggregate, SA's exports grew at less than half the rate pertaining to the developing countries. When assessed by technology category, only SA's export growth in MT comes close to the developing country average, and even in this category it lags over four percentage points behind.

While it is probably a little misleading to measure SA's performance against China's stellar growth given the latter's huge scale and labour cost advantages, the differences are very large. Despite current concerns regarding a significant slowing down of the Chinese economy, it is likely that China is still a long way off its long-run production frontier – the country will continue to grow its shares of developing country exports, possibly even more rapidly as it speeds up its unilateral trade liberalisation programme and acquires imported inputs at lower prices.

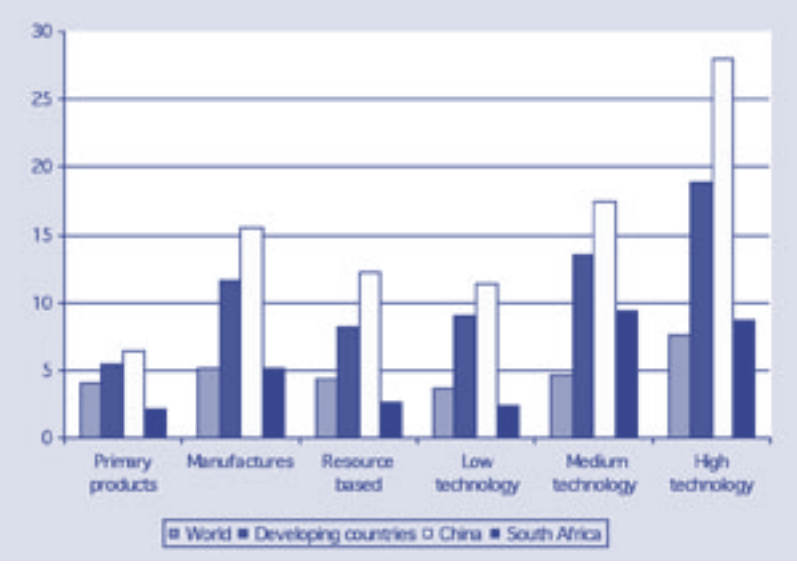
Export Composition

The trends in growth rates have, unsurprisingly, changed the structure of developing country export baskets. SA's export composition in 1992 and 2002, by comparison with other countries, reveals a number of features (see Figures 2 and 3, and the discussion that follows).

While declining somewhat in significance over the decade, primary products and resource-based manufactures constitute a far more significant share of SA exports than for

(continued on page 4)

Figure 1: Growth Rates by Technology Category, 1992-2002 (annual average %)



[7] Organisation for Economic Co-operation and Development
[8] International Standard Industrial Classification
[9] Newly Industrialised Countries
[10] All calculations use COMTRADE data, which are in nominal US dollars. In all of the tables to follow, the category 'All Sectors' refers to everything on Lall's list, including the 'other transactions'. In other words, 'All Sectors' is equivalent to total exports. However, because COMTRADE had no data for SA in some products, and to maintain comparability, the following had to be excluded: 043 (Barley, unmilled); 264 (Jute and other textile-based fibres), 286 (ores and concentrates of uranium); 333 (Petrol oils – crude); 351 (Electric current), 688 (Uranium depleted in u235); 951 (Armoured fighting vehicles).

(continued from page 3)

Figure 2: Export Composition by Technology: 1992

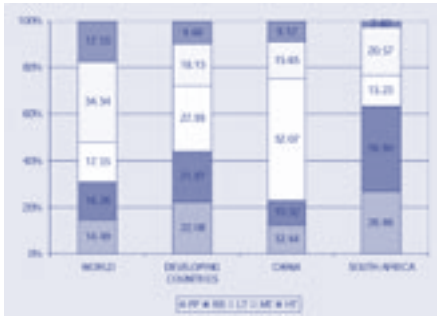
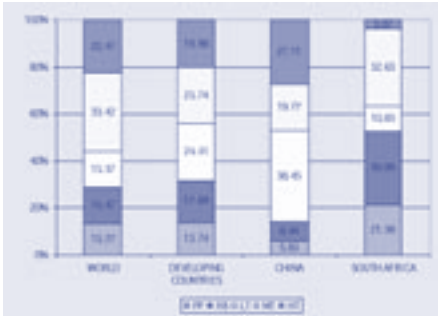


Figure 3: Export Composition by Technology: 2002



the world, developing countries or China. So despite some diversification of the industrial base since the early 1990s, SA remains much more reliant on resources for export earnings than other parts of the world.

LT manufactured exports constitute a much smaller share of SA exports than for the world, developing countries and China. MT manufactures represent a higher share of SA exports than for developing countries and is similar to the world level. The share has advanced very significantly in the last decade. And as discussed earlier, the share of HT products in SA's export basket is very low by comparison with the world, developing countries and China.

It is *not* that the direction of the change in the technological composition of SA's export has been different to other countries. HT exports increased their share in total exports for everyone, SA included; and the same is true of MT (the world average aside for now). LT decreased in importance for everyone, as did RB and primary products. The structure of SA exports is therefore evolving in a similar direction to global trade. However, the problem in SA's case is that this evolution has not occurred rapidly enough, which has had detrimental effects on the country's export market share.

Export Shares

Table 3 clearly shows that as the size of the global export pie has increased, SA's share in it, and in most of its divisions, has eroded, with the majority of the losses being taken up by better performing developing countries. By comparison with other developing countries, the sharp drop in SA's shares of total exports and manufacturing exports (declines of 43% and 45% respectively) is serious cause for concern.

Table 3: SA's Share in World and Developing Country Exports, 1992-2002 (%)

	World		Developing Countries	
Products	1992	2002	1992	2002
All Sectors	0.44	0.42	3.33	1.89
Primary products	0.82	0.68	4.02	2.93
Total Manufactures	0.38	0.38	3.14	1.72
Resource based	1.00	0.85	5.60	3.30
Low technology	0.34	0.30	1.58	0.84
Medium technology	0.27	0.41	3.77	2.59
High technology	0.07	0.07	0.90	0.36

[Source: COMTRADE and own calculations]

Despite the difficulties encountered by Brazil and Argentina, Latin American countries as a whole have succeeded in increasing their share of world manufactured exports – albeit a marginal increase and at a less rapid rate

than the developing country group average.[11] SA's changing exports shares are presented in Table 3.

When looking specifically at manufactures, SA has significantly increased its global presence in MT products. But this has not been sufficient to counteract the losses in all other technology categories. And in terms of shares in developing country manufactured exports, the huge losses in LT (almost half) and HT (a 60% decline) stand out.

Even in MT products, where SA has performed strongly at the global level, shares in developing country exports have dropped. In other words, SA is competitive in these activities *vis-à-vis* most industrialised countries, but is uncompetitive *vis-à-vis* fellow developing countries. SA has therefore benefited from the North-South relocation of MT industries. However, if other developing countries continue to expand their MT activities at much quicker rates than SA has managed (as has been the case between 1992 and 2002), the country will eventually see its global shares decline.

A more detailed breakdown (see Table 4) reveals, *inter alia*, that SA's share of developing country exports is particularly small with regard to the category LT1 – the 'fashion cluster' of textiles, garments and footwear.

Table 4: Detailing SA's Shares in Developing Country Exports, 1992-2002 (%)

Products	1992	2002
Primary products	4.02	2.93
Resource-based 1	3.28	2.25
Resource-based 2	7.60	4.12
Low-technology 1	0.60	0.39
Low-technology 2	3.68	1.44
Medium-technology 1	3.84	3.32
Medium-technology 2	6.24	3.81
Medium-technology 3	1.85	1.56
High-technology 1	0.48	0.26
High-technology 2	3.00	1.25

[Source: COMTRADE and own calculations]

In 2002, SA held 0.4% of developing country exports in this category, as compared to a total share of 1.9%; that is, LT1 comprised only one-fifth of SA's overall share in developing country exports. Moreover, this share has fallen by a third since 1992. This is in spite of favourable domestic policy in the form of the Duty Credit Certificate system and preferential trading arrangements like Agoa[12].

A second category that reveals an even lower SA share is HT1 – electronics and electronic products. SA's share in 2002 was 0.26% – down from 0.48% in 1992. While SA still holds 1.25% of the HT2 category (pharmaceuticals, aerospace etc.; see Table 1), that share has dropped by well over half.

MT1 (automotive) has experienced a relatively small decline, thanks in part to the controversial MIDP[13]. To the extent that export growth in this sector has been underpinned by export supports, it will clearly be vulnerable when those supports are no longer in place. The MIDP is due to end in 2012. MT2 (process industries) has seen the largest decline, most likely due to China's synthetics industry. MT3 (engineering industries) has performed best *vis-à-vis* developing countries, but as in all the rest, the 2002 share is below that of 1992.

Conclusion

While SA experienced growth in exports over the last decade (4.4% per annum) that significantly exceeded its GDP[14] growth (2.8% per annum), this rate of growth has been somewhat slower than world growth, slower than Latin America and substantially slower than the growth experienced by developing countries as a whole. This has been the result of poor performances primarily in resource-based, low- and high-tech manufactures.

This export trajectory has significant implications for employment. In their industrialisation phase, many developing countries experience major increases in employment, much of it located in low-technology, labour-intensive manufactures for export. SA's trajectory is very different. Exports have underperformed in these categories, and significant ground has been lost to other developing countries, particularly in Asia. By contrast, much of SA's comparative success has been in scale- and capital-intensive medium-technology products with low incremental output/labour ratios.

At the other end of the spectrum, SA is clearly struggling to upgrade into more technologically complex, dynamic products. This is in some respects the most worrisome feature of the country's recent record, because it is the clearest indication of policy failure. It will be very difficult to secure competitiveness in the production of highly labour-intensive products *vis-à-vis* extremely low-cost economies like China. But the East Asian NIC model, with its strong focus on technology policy, provides planners with important pointers for engineering a graduation into more technology-intensive products. It should not be overlooked that some high-technology products, such as electronic components, at least initially, generate significant low-skilled 'assembly-line' types of employment.

The basic challenge for SA and other middle-income countries is captured succinctly in the following excerpt from UNCTAD's recent publication, *Investment and Technology Policies for Competitiveness: A Review of Successful Countries*.

"An important consequence of the increase in the number of low-skilled workers participating in world trade is that it has altered the competitiveness of middle-income countries in manufacturing. In these countries the ratio of high-skilled to low-skilled labour tends to be above the average ratio for developing countries taken together, although it is below the average for developed countries. This gives the middle-income countries a competitive edge in low-skill manufactures, but they tend to lose this advantage once the highly populated developing countries with plenty of low-skilled workers become more active participants in world trade. Thus it is imperative that middle-income countries upgrade rapidly from low-skill to more market-dynamic, technology-intensive products with a view to successfully competing with industrialised countries and the first-tier NICs. If not, they risk being squeezed between the bottom and top ends of the markets for manufactured exports" (UNCTAD 2002:126).

SA is indeed a middle-income country whose exports are under threat of being 'squeezed' from both technological ends. All the indications are that the squeeze is intensifying.

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[11] Between 1980 and 1997, Latin America's share of world exports of manufactures rose from 1.5% to 3.5% (Kozul-Wright and Rayment, 2004: Table 2). However, this is largely due to a rapid rise on the part of Mexico.

[12] African Growth and Opportunity Act

[13] Motor Industry Development Programme

[14] Gross Domestic Product

Has the Internet Increased Trade? Evidence from Industrial and Developing Countries[1]

If the Internet made it easier for firms to enter new markets by reducing communication and search costs, it may also have made it easier to export goods and services. This report, produced by **George R. G. Clarke**[2] and **Scott J. Wallsten**[3], finds that higher Internet penetration in developing countries is correlated with greater exports to developed countries, but not with trade between developing countries or with exports from developed countries. Moreover, the analysis suggests that regulatory policies affecting telecommunications and Internet development indirectly affect trade, further emphasising the importance of deregulating potentially competitive services in the telecommunications industry.

Introduction

Much of the excitement surrounding the 'New Economy' did not survive the economic slowdown in 2001. However, two dramatic and real changes did take place in the mid-late 1990s and early 2000s. The first was a large increase in the international flows of goods, services and investment. Total world exports increased from 20% of gross world product in 1994 (US$5.9-trillion in 1995 US$) to 29% of gross world product (US$9.6-trillion) in 2001 (World Bank, 2003b). This increase is substantial, considering that exports had consistently varied between 18% and 20% of gross world product for the previous 15 years. The second was a revolution in Information and Communication Technologies (ICTs). Probably the most notable component of this was the dramatic growth of the Internet: the number of Internet hosts soared from 17 per 10,000 people in 1994 to 231 in 2001 (International Telecommunication Union, 2003).

Although export and Internet growth appear to have occurred contemporaneously, the two changes are not necessarily linked – with a relatively small number of annual observations, the timing could simply be coincidence. However, cross-country evidence also suggests a relationship between the Internet and globalisation: countries that export more tend to have higher Internet penetration than countries that export less.[4] The cross-country correlation suggests a possible causal relationship between Internet use and exports, but tells us little about the direction of causality. That is, even if the correlation is not spurious, we cannot determine whether trade openness encourages Internet use, Internet use stimulates trade, or both.

This paper contributes to the literature on the effect of the Internet on export behaviour in two ways. First, it recognises that the Internet may affect developing and developed countries differently. We find that Internet penetration is positively correlated with exports from developing countries to developed countries but not to other developing countries. Internet penetration does not appear to be correlated with exports from developed countries to other developed countries or to developing countries. Second, it assesses the extent to which Internet use affects exports, taking into account the endogeneity of Internet use. We do this through a two-stage approach using regulatory variables as instruments for Internet penetration. These instruments are correlated with Internet use, and hypothesis tests suggest that they are exogenous to aggregate exports.

Even after endogenising Internet use, we find that it is positively correlated with exports from poor to rich countries. Thus, while it is likely that trade openness also affects Internet use, we find evidence that Internet use affects exports from developing countries. Moreover, our instruments suggest policy implications: regulatory policies in developing countries that affect telecommunications and Internet development also indirectly affect those countries' exports.

Export Behaviour and Internet Use

Consistent with the country-level correlations, enterprises in developing and transition economies that export are far more likely than other enterprises to use the Internet to communicate with their clients and suppliers, according to surveys conducted by the World Bank (see Table 1). The difference between exporters and non-exporters appears to be true both in countries with high levels of Internet coverage (for example, Slovenia, Estonia and Slovakia) and countries with very low levels of coverage (for example, Tajikistan and Uzbekistan). Unfortunately, these enterprise surveys do not have detailed information on the destination of exports and therefore we cannot determine whether enterprises that export to developing countries differ from enterprises that export to developed countries.

The striking correlation between export behaviour and Internet use at the enterprise level in developing countries has several plausible explanations. One possibility is that enterprises that are already exporting are more likely to connect to the Internet. Exporters might connect to the Internet because it provides a relatively cost-effective method for international communications relative to international telephone calls or faxes: the local or domestic long-distance charges necessary to connect to the Internet are far lower than international rates, especially in developing countries.[5] A second possibility is that the benefits of Internet access increase as the firm's customers and suppliers connect (that is, there are network externalities). Because Internet use is nearly universal among firms in most developed countries, firms in developing countries that do business in developed economies might benefit more from Internet access than would firms that do business only domestically. For both these reasons, Internet access might be higher for enterprises that export (especially those that export to developed countries).

Several recent studies have suggested that trade stimulates Internet use. For example, Onyeiwu (2002, p.15) suggests that the "extent to which a country is integrated into the global economy can play a role in its access to IT. Countries with greater contact, either

[1] This is a abbreviated version of World Bank Policy Research Working Paper 3215, produced by Policy Research Working Papers, World Bank (2004). All findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent. Please visit http://econ.worldbank.org/files/33098_wps3215.pdf to access the full paper.

[2] George Clarke is a Senior Economist in the Development Research Group at the World Bank. Contact information for George Clarke: Development Research Group – Competition Policy and Regulation, World Bank, MSN MC3-300, 1818 H Street, N.W., Washington, D.C. 20433. Fax: 202-522-1155. Tel: 202-473-7454. Email: gclarke@worldbank.org

[3] Scott Wallsten is a fellow at the AEI-Brookings Joint Center for Regulatory Studies and resident scholar at the American Enterprise Institute. Contact information for Scott Wallsten: AEI-Brookings Joint Center, 1150 17th Street, N.W., Washington, D.C. 20036. Fax: 202-862-7169. Tel: 202-862-5885. Email: swallsten@aei.org

[4] The correlation between exports (as share of GDP) and the number of Internet users (as share of population) was 0.26 (p-value = 0.00) across countries in 2001.

[5] In 2001, the average (median) cost of a three-minute call from an OECD country to the US (average does not include US or Canada) was US$0.61 (US$0.33) for countries for which data were available, whereas the average for developing countries was US$11.35 (US$3.67). In contrast, on average a 3-minute local call cost US$0.07 (US$0.05) in developing countries and US$0.11 (US$0.11) in OECD countries. Data is from World Bank (2003b).

Table 1: Percentage of Manufacturing Enterprises with Internet Access

Country	Year	All (%)	Exporters (%)	Non-Exporters (%)	Difference between exporters & non-exporters (%)
Albania	2002	38.2	65.3	26.9	38.4
Algeria	2002	41.5	78.9	39.6	39.3
Armenia	2002	43.3	84.6	31.1	53.6
Azerbaijan	2002	34.1	63.0	28.2	34.8
Bangladesh	2002	70.6	86.0	58.9	27.1
Belarus	2002	56.0	79.2	46.6	32.5
Bosnia & Herzegovina	2002	60.4	75.4	52.6	22.8
Bolivia	2001	56.3	86.0	50.8	35.2
Bulgaria	2002	63.2	95.9	49.1	46.8
China	2001	71.2	81.8	64.7	17.0
Croatia	2002	79.7	89.0	72.1	16.9
Czech	2002	77.2	90.5	69.6	20.9
Estonia	2002	91.8	98.6	86.0	12.5
Ethiopia	2001	39.2	93.8	35.1	58.7
FYR of Macedonia	2002	50.0	70.6	41.0	29.6
Georgia	2002	41.4	72.7	30.8	42.0
Hungary	2002	75.2	92.8	66.3	26.5
Kazakhstan	2002	45.6	75.6	38.7	36.8
Kyrgyz Republic	2002	34.1	58.1	27.6	30.5
Latvia	2002	63.1	93.0	53.8	39.2
Lithuania	2002	72.0	98.4	60.1	38.2
Moldova	2002	38.5	65.5	25.0	40.5
Morocco	1999	49.3	59.0	35.9	23.1
Mozambique	2002	73.8	95.0	70.6	24.4
Pakistan	2002	33.8	74.9	23.7	51.2
Peru	2002	57.5	77.0	40.4	36.6
Poland	2002	69.0	88.5	60.3	28.2
Romania	2002	59.2	84.4	50.8	33.6
Russia	2002	57.3	88.2	49.1	39.1
Slovakia	2002	84.7	91.5	78.4	13.1
Slovenia	2002	92.6	97.1	87.2	9.8
Tajikistan	2002	13.1	25.7	10.1	15.6
Turkey	2002	54.3	77.8	45.1	32.6
Ukraine	2002	60.0	85.2	51.0	34.2
Uzbekistan	2002	23.1	60.6	17.6	43.0
Yugoslavia	2002	71.2	88.4	62.2	26.2

[Source: Investment Climate Surveys, The World Bank]

via trade, tourism, or geographical location, with the outside world, are more likely to be advanced in digital technology than other countries." Similarly, Caselli and Coleman (2001) argue that countries open to imports from high-income OECD economies will benefit from knowledge spillovers and hence be more likely to adopt new technologies.

Empirical studies of Internet adoption have found that Internet use is correlated with openness to trade even after controlling for other factors that might correlate with both.[6] For example, Wallsten (2003) and Baliamoune (2002) find that Internet users made up a greater share of the population in developing countries that are more open to trade. Other studies have also found that additional measures of ICT use and investment are correlated with various measures of openness.[7]

In general, the correlation between ICT use and openness appears to be stronger in developing countries. Several of the papers that find a positive correlation between measures of ICT use and openness focus on developing countries (Baliamoune, 2002; Onyeiwu, 2002; Wallsten, 2003), while others that have looked at both developed and developing countries find stronger results for developing countries.[8] These aforementioned studies have assumed, either explicitly or implicitly, that causation runs from openness to ICT use and investment.

Although openness to trade might affect Internet penetration, Internet access might also affect export behaviour. If access to the Internet

(continued on page 8)

[6] In recent years, a large literature has developed that looks at the determinants of ICT use and investment. Early studies, which generally do not include measures of openness, include Dasgupta *et al.* (2000), Kraemer et al. (2000) and Kiiski and Pohjola (2002).

(continued from page 7)

makes it less costly to find and communicate with potential customers in other markets, then, all else being equal, exports could be higher in countries where Internet penetration is greater. In practice, if the Internet merely substitutes for telephone calls or faxes, it is not likely to have a large impact on costs. Expenditures on telephone and postal services in Peru, for example, were only 1% of sales (or about 8% of labour costs) for the median enterprise in a 2002 survey of formal enterprises in Peru.[9] Since Internet access does not eliminate all other communications costs, the total savings from Internet access will be relatively modest if it only substitutes for existing methods of communication.

On the other hand, Internet access might affect costs associated with exporting in other ways. In particular, Freund and Weinhold (2000, p. 4) argue that the Internet might help to create global markets for traded goods by reducing the fixed costs associated with exporting. The Internet could reduce costs "both directly via organised exchanges with numerous buyers and sellers and indirectly through powerful search engines, which enable sellers to notify buyers of prices instantaneously. This is very different from other recent innovations, such as the telephone or the fax, which only assist in bilateral communications." Daly and Miller (1998) present evidence from a 1998 survey of enterprises in 15 low- and middle-income countries that suggests that firms in these countries do, indeed, use search engines to research market opportunities.[10] Of the 58 enterprises that reported having Internet access in their survey, 26 reported using search engines to look for marketing and production information. This was the second most common use of search engines, after looking for technical and computer information. To the extent that these uses reduce the fixed costs of finding markets and buyers, Internet access might therefore increase exports.

Most empirical studies have focused on whether openness to trade affects Internet penetration. However, several recent studies have asked whether Internet use affects trade. For example, using data from 20 low- and middle-income countries in Eastern Europe and Central Asia, Clarke (2001) shows that enterprises with Internet connections export more, as a share of their total sales, than enterprises without connections. In addition, using a gravity model of trade, Freund and Weinhold (2000) find that Internet use appears to be significantly correlated with trade after 1996, although they find only a weak correlation in 1995 and 1996. They also find that the Internet has a greater effect on trade in developing countries than it does in developed countries. In a second paper, Freund and Weinhold (2002) find that exports of services to the US grew more quickly for countries with greater Internet penetration in a sample of 31 middle- and high-income countries. Freund and Weinhold (2000; 2002) control for the possibility of reverse causation only indirectly, by lagging the variable representing Internet penetration by two periods.[11] Given that exports and Internet use both persist over time, lagged values might not fully control for reverse causation.[12]

The benefits of Internet access may be especially pronounced for firms in developing countries. Indeed, the cross-country correlation between export behavior and Internet use noted above is almost entirely due to developing countries – the correlations between exports and Internet use are 0.51 (p-value = 0.00) and -0.05 (p-value = 0.81) for developing and developed countries respectively. Further, for developing countries, Internet use is correlated only with exports to developed countries – the correlations between Internet use and exports to developed and developing countries are 0.52 (p -value = 0.00) and 0.18 (p-value = 0.14) respectively.[13] In summary, although exports from developing countries are correlated with Internet use, this only appears to be true for exports to developed countries. This correlation seems reasonable. Internet access is ubiquitous among enterprises in developed countries, and small differences in country-level Internet penetration probably reflect differences in access by individuals or households, not businesses. In contrast, surveys reveal Internet access to be less common at even the enterprise level in developing countries (see Table 1), suggesting that reported differences in Internet penetration reflect differences in coverage at the enterprise level as well. Indeed, Internet use at the individual level is highly correlated with Internet use at the enterprise level in the developing countries for which we have information on both (the correlation is 0.71 with a p-value=0.00).[14]

In the next section, we test how the correlation between exports and Internet use differs among developing and developed countries, and explore whether it is robust to controlling for other variables and to allowing Internet use to be determined endogenously.

Empirical Estimtion

Cross-Sectional Estimation

To test whether Internet use affects exports, we use country-level data to estimate equation (1):

[illegible] (1)

The dependent variable is exports from country *i* to country group *j*. Based upon the simple correlations, we look at exports to three different country groups: developing countries, developed countries and total exports (that is, to all countries). In addition, we also estimate separate regressions for high- and low-income countries and test whether the two samples can be pooled into a single regression. The test is reasonable given that exports from developing countries appear correlated with Internet access, whereas exports from developed countries do not. Export data comes from the UN Statistical Division COMTRADE database.

[7] For example, Onyeiwu (2002), which looks at the determinants of IT use in 54 countries in Africa, finds that IT use tends to be higher in countries that are more open (i.e., that import more). The dependent variable in this study is a composite measure of 'digitalisation' that is a weighted average of Internet users and hosts, personal computers, telephone lines and cell phones. Using data from a survey of 2,139 enterprises from 10 middle and high-income countries, Kraemer *et al.* (2002) show that enterprises that are more internationalised (in terms of operations, sales and inputs) are more likely to engage in business-to-business (B2B) e-commerce, but not in business-to-consumer (B2C) e-commerce. Caselli and Coleman (2001) show that ICT investment is higher in countries that import more manufactured goods from countries in the OECD. Muller and Salsas (2003) find that the number of PCs, but not the number of Internet users and hosts, is correlated with imports. Finally, Clarke (2003), which uses enterprise level data on Internet use for Eastern Europe and Central Asia, fails to find a positive correlation between openness to imports at the country level and Internet use at the enterprise level. In fact, in some model specifications, Clarke (2003) finds a negative correlation. This negative result, however, is due to imports from low and middle-income countries. Imports from high-income countries are positively correlated with Internet connectivity.

[8] For example, Caselli and Coleman (2001) show that the correlation between openness and investment in ICT is stronger for countries that do not export computers – a sample that will probably include most low-income developing countries.

[9] These communications costs were only fractionally higher for exporters than for non-exporters (1.1% of sales for exporters compared to 1.0% of sales for non-exporters). Data comes from the 2002 Investment Climate Survey for Peru, which asked questions about costs associated with telecommunications services. The World Bank, in collaboration with Andean Development Corporation, conducted the 2002 Investment Climate Survey. The survey is described in World Bank (2003a).

[10] Daly and Miller (1998) note that their sample, comprised of International Finance Corporation (IFC) client companies, was not random. In particular, they note that IFC clients are likely to be more technologically sophisticated than other enterprises in developing countries. Given the high level of Internet connectivity they report (about 75% of industrial firms), it seems likely that this is the case. However, Internet connectivity has increased greatly in recent years in developing countries and the technical sophistication of the 'average' enterprise has, therefore, also likely increased since 1998.

[11] Freund and Weinhold (2002, p. 239) acknowledge the potential for reverse causation, noting: "[h]owever, causality probably runs both ways: increasing trade in services leads firms to adopt the Internet to facilitate that trade and greater Internet penetration causes firms to use the Internet for trade in services."

[12] For example, the correlation between Internet users as share of the population in 1995 and 2001 was 0.73. The correlation remains statistically significant after controlling for per capita income. Similarly, exports as share of GDP are also highly correlated over time. The correlation between exports as share of GDP in 1990 and 2001 was 0.81.

[13] For developed countries, the correlations between Internet use and exports to developed and developing countries are 0.01 and 0.02 respectively. Both correlations are statistically insignificant.

[14] See Table 1 for sources of data. Unfortunately, we do not have comparable information on Internet use in developed countries.

Table 2: Countries in the Sample

High-Income Countries	Developing Countries		
Australia	Albania	Indonesia	Sri Lanka
Austria	Argentina	Iran, Islamic Rep.	Swaziland
Bahrain	Azerbaijan	Jordan	Tanzania
Belgium	Barbados	Latvia	Thailand
Canada	Belarus	Lithuania	Togo
Cyprus	Benin	Macedonia, FYR	Trinidad and Tobago
Denmark	Bolivia	Malawi	Tunisia
Finland	Botswana	Malaysia	Turkey
France	Brazil	Mauritius	Uganda
Germany	Burkina Faso	Mexico	Uruguay
Greece	Burundi	Moldova	Venezuela, RB
Iceland	Cameroon	Mongolia	Zambia
Ireland	Cape Verde	Morocco	
Italy	Chile	Mozambique	
Korea, Rep.	China	Namibia	
Malta	Colombia	Niger	
Netherlands	Costa Rica	Pakistan	
New Zealand	Czech Republic	Paraguay	
Norway	Ecuador	Peru	
Portugal	Egypt, Arab Rep.	Philippines	
Singapore	Estonia	Poland	
Slovenia	Fiji	Romania	
Spain	Georgia	Russian Federation	
Sweden	Grenada	Rwanda	
Switzerland	Guatemala	Saudi Arabia	
UK	Guinea	Senegal	
US	Hungary	SA	

The data is for 2001 and countries for which all data were available are listed in Table 2.

The main independent variable, *Internet Use*$_i$, is Internet users in country *i* as percent of the population. This variable represents Internet penetration and comes from the International Telecommunication Union (ITU) (2003). The ITU estimates the number of Internet users using data from various sources, including subscriber counts from Internet access providers and estimates based upon the number of Internet hosts in each country. Although the variable is far from perfect, it is highly correlated with other measures of Internet use, including estimates of the percentage of enterprises in developing countries with access to the Internet (ρ = 0.71). As a robustness check, we also estimate equation (1) replacing Internet users as percent of the population with Internet hosts per 100 persons.[15]

A statistical correlation between Internet use and exports at the firm level may arise from omitting relevant variables that affect both of them from the analysis. For example, more efficient or technologically advanced firms might be more likely to have access to the Internet because they have greater resources available for investment in information technology or because investing in IT improves productivity.[16] Since more efficient firms in developing countries also appear to be more likely to export, the correlation between export behavior and Internet access could simply be spurious.[17] If small enterprises are less likely to export and also less likely to have access to the Internet, omitting variables to control for enterprise size could lead to biased results.[18] Similarly, cross-country differences between industry structure and performance could also result in a spurious correlation in country-level correlations if the analysis does not adequately control for factors that affect both access and export behaviour.

Thus, in addition to the main independent variable (Internet use), we also include several additional variables to control for natural openness. These include population, area, per capita GDP, per capita GDP squared and a dummy variable representing whether the country is a major oil exporter. Pritchett (1996) uses similar variables, without a measure of Internet use, in regressions explaining trade openness.[19] These variables come from the World Bank (2003b).

Table 3 shows means and variances for the dependent and independent variables.

As discussed previously, even if export behaviour is correlated with Internet use, the direction of causality remains unclear. We use an instrumental variables approach to address this issue. Our main instrument for Internet access is a variable obtained from the ITU (2002) representing whether a single company has a legal monopoly over data transmission services in a given country.

We believe the instrument is appropriate. If companies with legal monopolies over data transmission restrict access to data lines, as we would expect a monopoly to do (by setting prices above the competitive price), Internet access might be lower in those countries. One extreme example of this is in Malawi. Prior to telecommunications reform in 1998, the monopoly telecommunications provider in Malawi, Malawi Post and Telecommunications Corporation (MPTC), had a monopoly of both data and leased lines[20]. It used this monopoly to prevent Internet Service Providers (ISPs) from entering the market by refusing to provide them with the lines that they requested (Article 19, 1998).

Moreover, regulatory rules regarding entry into communications services are unlikely to affect exports other than through their effect on exporting firms' communications with their customers. This instrument also performs well statistically. In first-stage regressions of Internet access on the instrument and the other included variables, the coefficient on the regulatory variable is negative and significant at the 5% level (see Table 4). In other words, as we expected, Internet access is lower in countries

(continued on page 12)

[15] The measure of Internet hosts also comes from International Telecommunication Union (2003), using data collected by the Internet Software Consortium (http://www.isc.org) and RIPE (http://www.ripe.net). It is based upon the country code in the Internet host address (rather than actual physical location).

[16] Using enterprise-level data from Eastern Europe and Central Asia from 1999, Clarke (2003) shows that better performing enterprises were more likely to have Internet access.

[17] Many studies have found that enterprises that export are more efficient than enterprises that do not – see Tybout (2000) for a summary of the literature. This result could be because efficient enterprises self-select into exporting (i.e., the *self-selectivity hypothesis*) or because the discipline of exporting directly improves efficiency (i.e., the *learning-by-exporting hypothesis*).

[18] Several studies of small manufacturing enterprises in developing countries found that such firms are less likely to export than larger entersprises. Biggs (2003) provides a summary of this literature.

[19] In addition to adding Internet use, we also omit one variable used in Pritchett (1996), the CIF/FOB (cost, insurance and freight/free on board) ratio, since this was not available for most countries in the sample.

[20] Clarke *et al.* (2003) describes telecommunications reform in Malawi

SA TRADE AT A GLANCE

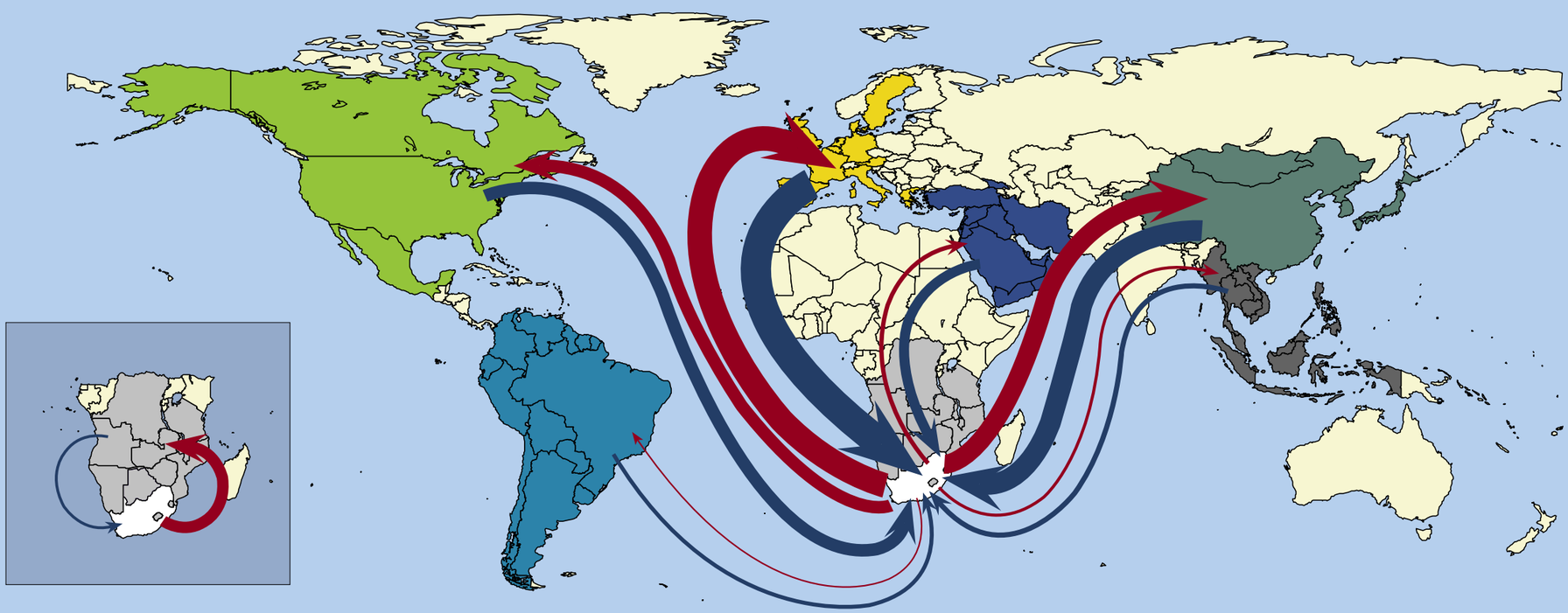
SA Trade Flows to the World

Year	Q1 2003		Q1 2004		Q4 2003		Q1 2004	
Units	Rbn	US$bn	Rbn	US$bn	Rbn	US$bn	Rbn	US$bn
Total Exports	58.35	**7.02**	64.50	**9.54**	62.24	**9.24**	64.50	**9.54**
Total Imports	62.01	**7.45**	61.33	**9.07**	63.18	**9.35**	61.33	**9.07**
Trade Balance	-3.66	**-0.43**	3.17	**0.47**	-0.94	**-0.11**	3.17	**0.47**

SA Trade with the World: Percentage Growth Rate

Year	Q1 2003 – Q1 2004 (%)	Q4 2003 – Q1 2004 (%)
Total Exports	**10.54**	3.63
Total Imports	**-1.10**	-2.93

Note: Growth rates have been calculated on the Rand values



Top Three Non-Mineral Exports from and Imports to SA from Regions (HS4, Q1 2004)

Region	Exports			Imports		
	Products	Value (Rbn)	% Share	Products	Value (Rbn)	% Share
EU	Centrifuges	1.52	7.40	Vehicle parts	2.97	11.09
	Grapes	1.08	5.29	Aircraft	2.10	7.82
	Ferroalloys	0.93	4.56	Motor vehicles	1.66	6.20
East Asia	Ferroalloys	1.40	12.76	Vehicle parts	1.86	15.33
	Motor vehicles	1.07	9.80	Motor vehicles	0.85	7.03
	Fuel wood	0.53	4.86	Data process machines	0.81	6.64
NAFTA	Motor vehicles	0.72	10.27	Motor vehicles	0.35	5.63
	Ferroalloys	0.54	7.69	Aircraft	0.33	5.34
	Centrifuges	0.17	2.41	Nuclear fuel elements	0.26	4.25
SADC	Trucks	0.15	3.35	Cotton	0.14	10.51
	Beverages	0.13	2.77	Tobacco	0.05	3.49
	Iron structures	0.12	2.54	Cotton yarn	0.03	2.04
Middle East	Flat-rolled iron	0.16	8.02	Fertilisers	0.10	4.06
	Flat-rolled stainless steel	0.05	2.74	Hydrocarbons	0.062	2.56
	Aircraft	0.05	2.49	Polymers	0.051	2.09
South-East Asia	Flat-rolled stainless steel	0.18	9.72	Vehicle parts	0.305	11.37
	Flat-rolled iron	0.14	7.36	Data processing equipment	0.27	9.88
	Chemical woodpulp	0.13	6.98	Office machine parts	0.24	9.03
South America	Ferroalloys	0.08	12.04	Vehicle parts	0.353	15.05
	Fertiliser	0.04	6.33	Soybean oilcake	0.28	12.02
	Insecticides	0.03	4.97	Maize	0.26	11.01

Note: Share refers to the proportion of total exports/imports from the specified trade partner

EU
East Asia
NAFTA
SADC
Middle East
South-East Asia
South America

Top 10 Export Markets and Import Sources (Q1 2004), all products

Exports			Imports		
Country	Value (Rbn)	Share (%)	Country	Value (Rbn)	Share (%)
UK	6.56	10.18	Germany	8.54	13.93
US	6.33	9.82	US	5.71	9.31
Japan	6.04	9.36	UK	4.99	8.14
Germany	4.26	6.61	France	4.67	7.61
The Netherlands	2.73	4.23	Japan	4.60	7.50
Switzerland	2.17	3.37	China	4.46	7.27
China	1.82	2.83	Italy	2.17	3.54
Australia	1.78	2.76	Australia	1.88	3.07
Italy	1.64	2.54	Saudi Arabia	1.57	2.56
Belgium	1.55	2.41	Iran	1.46	2.38
Total	34.89	54.1	**Total**	40.06	65.3

Note: Share refers to the proportion of total exports/imports

SA Trade with the World: Top 10 Products (HS2; Q1 2004)

Products	Total Exports (Rbn)	% of Total Exports	Products	Total Imports (Rbn)	% of Total Imports
Precious metals and stones	19.54	30.30	Machinery and boilers	12.03	19.61
Iron and steel	7.56	11.71	Electric machinery	6.32	10.31
Vehicles	4.86	7.53	Special motor parts	5.79	9.45
Machinery and boilers	3.87	6.00	Vehicles	4.94	8.05
Mineral and fuel oils	3.42	5.30	Mineral and fuel oils	3.96	6.46
Aluminium	2.42	3.75	Aircraft	2.89	4.71
Ores, slag and ash	2.40	3.72	Medical & surgical equipment	2.16	3.51
Citrus fruit	1.97	3.06	Pharmaceutical products	1.80	2.93
Inorganic chemicals	1.37	2.13	Precious metals and stones	1.58	2.58
Electric machinery	1.26	1.96	Plastics	1.56	2.54
Total	48.67	75.5	**Total**	43.04	70.2

SA Trade by Region (Rbn)

	Q1 2003		Q1 2004		Q4 2003		Q1 2004	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
EU	20.57	28.38	20.50	26.82	18.30	25.35	20.50	26.82
East Asia	7.91	10.44	10.96	12.16	10.67	11.76	10.96	12.16
NAFTA	5.30	6.31	7.02	6.22	6.99	6.92	7.02	6.22
SADC	5.37	1.32	4.53	1.36	5.69	1.40	4.53	1.36
Middle East	2.17	4.59	1.96	2.43	2.02	5.20	1.96	2.43
South-East Asia	1.54	2.46	1.85	2.69	1.40	2.52	1.85	2.69
South America	0.55	2.03	0.67	2.35	0.56	1.95	0.67	2.35
Rest of Africa	2.31	0.68	2.48	0.54	2.54	0.79	2.48	0.54
Rest of the World	11.64	3.39	13.02	4.39	12.86	3.64	13.02	4.39

(continued from page 9)

Table 3: Means and Standard Deviations of Variables Included in Model

Variable	Source	High-Income Countries			Low-Income Countries		
		Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Exports (% of GDP)	COMTRADE	31	37.0%	27.0%	76	26.2%	20.8%
Exports to high-income countries (% of GDP)	COMTRADE	31	27.9%	18.9%	76	16.1%	16.7%
Exports to low-income countries (% of GDP)	COMTRADE	31	9.1 %	14.2%	76	10.0%	10.0%
Internet Users (% of population)	ITU (2003)	31	35.4%	13.3%	68	4.7%	6.1%
Internet Hosts (Per 100 population)	ITU (2003)	30	66.4%	77.9%	76	3.1%	6.3%
Entry Restrictions for ISPs (Dummy)	Wallsten et al. (2003)	-	-	-	30	56.7%	50.4%
Monopoly for Data Lines (Dummy)	ITU (2002)	26	7.7%	27.2%	74	24.3%	43.2%
Monopoly for ISPs (Dummy)	ITU (2002)	28	3.6%	18.9%	59	10.2%	30.5%
Monopoly for Leased Lines (Dummy)	ITU (2002)	27	11.1%	32.0%	70	54.3%	50.2%
Population (Natural Log)	World Bank (2003b)	31	15.8	1.8	76	15.9	1.9
Area (Natural Log)	World Bank (2003b)	27	11.5	2.6	75	11.8	2.4
GDP per Capita (000s of US$, PPP adjusted)	World Bank (2003b)	30	24.8	7.5	75	5.6	3.7
Oil Exporter [a] (Dummy)	COMTRADE	31	6.5%	25.0%	76	9.2%	29.1%
Member of WTO (Dummy)	WTO website [b]	31	96.8%	18.0%	76	85.5%	35.4%
Member of WTO Agreement on Telecoms	WTO website [c]	31	87.1%	34.1%	76	56.6%	49.9%
Average Tariff	COMTRADE [d]	25	3.4	1.9	73	10.7	5.7
Political Openness	Kraay et al (2003)	30	1.2	0.4	69	-0.1	0.8
Remoteness from rest of world (inverse of the mean of log GDP for trading partners divided by log distance)	Rose (2003b)	31	0.5	0.0	75	0.5	0.0

Notes: COMTRADE is United Nations Statistical Division (UNSD) Commodity Trade (COMTRADE) database.
[a] Oil Exporters are countries for whom oil makes up more that 30% of exports. High-income countries are countries with per capita income over US$10,000.
[b] Data is available on http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm
[c] Includes countries that were signatories of the original basic telecommunication services and those that had subsequently reached agreement on telecommunications services by the end of 2000 (including those that reached agreement based upon the accession agreements).
[d] Data was supplemented with data from Heritage Foundation (2003) for most recent year available.

with monopolies over data lines. While we believe this variable to be a good instrument, we also use alternate instruments to test over-identifying assumptions and as a robustness check. In particular, we use two additional dummies – one indicating whether a single firm had a legal monopoly over Internet Service Provision and another indicating whether a firm had a legal monopoly over leased lines.

Although the first variable is intuitively appealing, it does not perform as well as the dummy representing monopoly provision of data lines; in a first-stage regression, the coefficient on the dummy variable representing monopoly provision of Internet Service Provision is statistically insignificant (see Table 4)[21]. One plausible reason for the statistical insignificance is that ISPs are monopolies in only a few countries (10%) of our sample. In contrast, data lines are monopolies in 24% of the countries in our sample. Further, the ISP information is available for fewer countries than is the information on data lines (80 and 91 countries respectively).

As a final robustness check, we also use an additional instrument – a dummy variable representing whether ISPs are required to get formal approval from the telecommunications regulator before starting operations. Wallsten (2003) shows that countries that require formal approval for ISPs have lower Internet penetration. Unfortunately, this variable, which comes from a World Bank survey of regulatory agencies in developing countries, is available for only a small sub-sample of the countries for which export data were available (26 countries) and is not available for any high-income countries.[22]

Although the variables included in Pritchett (1996) seem to be a reasonable set of country controls, we also test whether the results are robust to including additional variables. One concern is that countries that liberalise their trade policies might also be more likely to liberalise other parts of their economies, including their telecommunications sectors, potentially leading to omitted variable bias. In particular, countries that are members of the World Trade Organisation (WTO) might be more likely to liberalise their telecommunications sectors – for example by joining the optional WTO agreement on basic telecommunication services or agreeing to liberalise during accession negotiations. Further, countries that join the WTO might also export more – although recent studies have failed to find strong evidence that countries that belong to the WTO have more liberal trade policies than other countries.[23] Consequently, as a robustness check, we add a variable indicating that the country is a member of the WTO and a variable indicating that it has signed the WTO agreement on basic telecommunication services to the base regression. In addition to the dummies representing WTO membership, we also add a variable representing the average (weighted) tariff in the country as an additional measure of liberalisation.

Another concern is that countries that are more politically open might be more likely to allow easy Internet access, because they are less concerned about citizens accessing information critical of them that might be available on the Internet, and be more open to trade and investment. Consequently, we also add a variable to control for political openness to the base regression to check robustness. The variable is the index of 'voice and

[21] Recent studies have shown that coefficients on endogenous variables can be biased when weak instruments are used (see, for example, Staiger and Stock, 1997).
[22] Wallsten *et al.* (2003) describe the data and the survey.
[23] In particular, Rose (2003b) fails to find strong evidence that countries that are members of the WTO actually have more liberal trade policies, while Rose (2003a) fails to find evidence that membership increases trade.

Table 4: First Stage Regressions of Internet Use on Regulatory Variables (OLS)

Dependent Variables	OLS	OLS	OLS	OLS
	Internet Users(as % of Population)			
Observations	91	80	88	26
Monopoly for Data Lines	-0.0362**			
(Dummy)	(-2.25)			
Monopoly for ISPs		-0.0187		
(Dummy)		(-0.82)		
Monopoly for Leased Lines			-0.0477***	
(Dummy)			(-3.03)	
Entry Restrictions for ISPs				-0.0660**
(Dummy)				(-2.26)
Population	-0.0061	-0.0052	-0.0116	-0.0297**
(Natural Log)	(-0.59)	(-0.47)	(-1.02)	(-2.31)
Area	0.0001	-0.0013	0.0031	0.0060
(Natural Log)	(0.02)	(-0.20)	(0.48)	(0.80)
GDP per Capita	0.0128***	0.0140**	0.0114**	0.0386***
(000s of US$, PPP adjusted)	(2.73)	(2.48)	(2.32)	(3.24)
GDP per Capita Squared	0.0001	0.0001	0.0001	-0.0020**
(000s of US$, PPP adjusted)	(0.57)	(0.33)	(0.64)	(-2.57)
Oil Exporter	-0.0015	-0.0058	-0.0004	-0.0018
(Dummy)	(-0.06)	(-0.14)	(-0.02)	(-0.12)
Constant	0.0839	0.0772	0.1623	0.3938*
	(0.71)	(0.59)	(1.20)	(2.09)
R-Squared	0.80	0.79	0.80	0.62

**** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.*
Note: T-statistics are in parentheses. Standard errors are Huber-White robust standard errors.

accountability' from Kaufmann *et al.* (2003), which is a measure of political and civil rights in the country.

The final additional control that we add is for natural openness, representing the distance of the country from the rest of the world. This variable, constructed by Rose (2003b), is defined for country *i* as the inverse of the mean of log real GDP for the export partner, country *j*, divided by the log of the distance between countries *i* and *j*.

Empirical Results

Results from OLS Regressions Table 5 presents results from regressions of total exports, exports to high-income countries and exports to low-income countries on Internet use and additional control variables suggested in the literature on trade openness. The table presents results from separate regressions for high- and low-income countries. Since Internet use might affect enterprises in developing and transition countries differently than enterprises in developed countries, this approach seems appropriate.

For high-income countries, the coefficients on Internet users as share of the population are statistically insignificant and economically small in all equations after controlling for other factors that might affect openness. According to the point estimates, a one-percentage point increase in the percent of the population that uses the Internet would increase exports as share of GDP by about 0.1 percentage points and would increase exports to high-income countries by about 0.05 percentage points. Given the widespread adoption of the Internet in most developed countries, the relatively modest impact of increased access might not be surprising.

For developing countries, contrarily, the coefficients on Internet users as share of the population are statistically significant and economically large. Assuming for now that causality runs from internet use to exports, the point estimates suggest that a one-percentage point increase in the share of the population with access to the Internet would increase total exports as percent of GDP by 1.4 percentage points and would increase exports to high-income countries by 1.3 percentage points. In contrast, increased Internet access does not appear to have a statistically significant impact on exports to developing countries.

For the most part the coefficients on the additional control variables are statistically insignificant. The only exceptions are the coefficients on area in the regressions for exports from high-income countries and the coefficients on area and population in the regression for exports to developing countries from developing countries. Although the coefficients on per capita GDP and per capita GDP squared are generally statistically insignificant at conventional significance levels (both singly and jointly), consistent with Pritchett (1996) the coefficients on the linear terms are positive while the coefficients on the squared term are negative.[24]

Results from 2SLS Regressions Although the OLS results suggest that the correlation between Internet use and exports is robust to the inclusion of additional variables that might affect both Internet use and openness, reverse causation remains a concern. When we test the null hypothesis that the variable representing Internet users as percent of the population is exogenous in the equations where the coefficients are statistically significant, we reject the null hypothesis in the regression for total exports from developing countries and fail to reject the null hypothesis in the regression for exports to high-income countries from developing countries.[25]

Given that Hausman-type tests are typically relatively weak in small samples, this favours the results from the 2SLS regressions and suggests that Internet use is probably determined endogenously with exports.

To address this issue, we re-estimate the base regression shown in Table 5, allowing the variable representing Internet use to be endogenous. To instrument for Internet use, we use the regulation dummy variable discussed above, which indicates whether the government allows a single firm to maintain a monopoly over data lines. We use this variable rather than any of the other variables (or a combination of dummies) due to concerns about missing data – including additional instruments can sharply reduce sample size. In the next subsection, as a robustness check, we test other combinations of plausible instruments. This variable seems to be an appropriate instrument in that it is highly correlated with the endogenous variable, Internet users as percent of the population. In a first stage regression, the coefficient has an expected negative sign (i.e., Internet use is lower in countries where a single firm has a monopoly over data lines) and is statistically significant at a 5% significance level (see Table 4). The point estimate of the parameter suggests that, on average, there are 3.6 fewer Internet users per 100 people in countries that maintain legal monopolies over data lines.

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[24] In most cases, the coefficient on per capita income remains statistically insignificant after dropping the squared term. The one exception is in the regression for exports to high-income countries for the sample of high-income countries.

[25] The χ^2 (1) statistic is 3.80 in the regression for total exports and negative in the regression for exports to high-income countries. In small samples, negative test-values are not uncommon in Hausman-type tests. This is a particular problem in regressions that use robust standard errors (see Baum *et al.*, 2003, p. 27).

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Table 5: Effect of Internet on Exports (OLS)

Sample	OLS	OLS	OLS	OLS	OLS	OLS
	High Income Countries			Developing Countries		
Dependent Variables	Exports (% of GDP)	Exports to high-income countries (% of GDP)	Exports to low- and middle-income countries (% of GDP)	Exports (% of GDP)	Exports to high-income countries (% of GDP)	Exports to low- and middle-income countries (% of GDP)
Observations	27	27	27	66	66	66
Internet users	0.1146	0.0523	0.0623	1.4311**	1.2869**	0.1442
(As % of Population)	(0.27)	(0.16)	(0.41)	(2.08)	(2.27)	(0.57)
Population	0.0434	0.0124	0.0309	-0.0314	-0.0035	-0.0279***
(Natural Log)	(1.03)	(0.43)	(1.52)	(-0.89)	(-0.10)	(-2.77)
Area	-0.1051**	-0.0586**	-0.0465*	0.0242	0.0049	0.0193**
(Natural Log)	(-2.33)	(-2.59)	(-1.78)	(0.88)	(0.18)	(2.31)
GDP per Capita	0.0629	0.0301	0.0327	0.0271	0.0208	0.0063
(000s of US$, PPP adjusted)	(0.92)	(0.52)	(0.74)	(1.28)	(1.16)	(0.53)
GDP per Capita Squared	-0.0010	-0.0003	-0.0007	-0.0015	-0.0013	-0.0002
(000s of US$, PPP adjusted)	(-0.66)	(-0.21)	(-0.79)	(-1.06)	(-1.14)	(-0.24)
Oil Exporter ¤	0.0468	-0.1413	0.1881	0.0369	-0.0041	0.0410
(Dummy)	(0.57)	(-1.09)	(1.21)	(0.61)	(-0.06)	(1.16)
Constant	-0.0672	0.1894	-0.2566	0.3358	0.0496	0.2861**
	(-0.08)	(0.29)	(-0.45)	(1.17)	(0.19)	(2.19)
R-Squared	0.47	0.38	0.50	0.30	0.28	0.13

**** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.*
Note: T-statistics are in parentheses. Standard errors are Huber-White robust standard errors.

The results from the 2SLS regressions are qualitatively similar to results from the OLS regressions (see Table 6). In particular, the coefficient on Internet users as percent of population is statistically insignificant and relatively small in all the regressions for exports from high-income countries, and in the regressions on exports from developing countries to other developing countries. In contrast, the coefficients are large and statistically significant in the regressions for total exports from low-income countries and exports from low-income countries to high-income countries. The coefficients are larger in the 2SLS regression than in the OLS regressions – the point estimates of the parameters suggest that a one percentage point increase in the number of Internet users increases total exports by 4.3 percentage points and exports from low-income countries to high-income countries by 3.8 percentage points. Although this might suggest that the effect is very large, it is important to keep in mind that there are very few Internet users per 100 people in many developing countries (see Table 3). Consequently, a one percentage point increase in the number of Internet users as percent of the population is large.

Evaluated at the mean values for exports and Internet use in developing countries, the elasticity of total exports with respect to Internet use is about 0.8 and the elasticity of exports to high-income countries is about 1.0.

Robustness Checks for Cross-Sectional Results

Additional Control Variables The variables included in the base regression, which were based upon the set of variables included in Pritchett (1996) do not include some variables that might potentially affect both Internet use and trade. One concern is that countries that are especially open to trade might also be more likely to liberalise their economies in other ways, including liberalising telecommunications services. To try to reduce the possibility that the omission of variables that proxy for openness to trade might affect results, we add several additional control variables to the base regression. As a first test, we add dummy variables indicating that the country is a member of the WTO and that the country had signed the optional WTO agreement on basic telecommunication services to the base regression.

The dummies are both statistically insignificant and do not appear to affect the main results (i.e., the coefficient on Internet use remains statistically significant at a 5% level and about the same size as before – see Table 7). As a second test, we add an alternative control for trade policy to the base regression – the average weighted tariff in 2001. The coefficient on this variable is also statistically insignificant and does not appear to affect the coefficient on Internet use.

In addition to adding variables to control for trade policy, we add two other variables to the base regression as additional checks. The first variable is a measure of political openness – countries that are more politically open might be more likely to allow their citizens free access to the Internet and also might be more open to trade and investment. The second variable is a measure of 'remoteness' – how far the country is from other markets.[26] Adding these variables also does not appear to affect any of the main results – the coefficient on Internet use remains statistically significant at a 5% level and the coefficients on the additional control variables are statistically insignificant at conventional significance levels.

Internet Hosts As discussed above, the measure of Internet use, Internet users as percent of the population, is based upon ITU estimates. Therefore, we replace this variable with the number of Internet hosts (per 100 people) as a robustness check. The results are broadly similar to the results using Internet users. The coefficient on Internet hosts is not statistically significant in the regression for exports from high-income countries to other high-income countries but is statistically significant and positive in the regression for exports from

[26] This measure comes from Rose (2003b)

Table 6: Effect of Internet on Exports (2SLS)

Sample	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
	High Income Countries			Developing Countries		
Dependent Variables	Exports (as share of GDP)	Exports to high-income countries (as share of GDP)	Exports to low- and middle-income countries (% of GDP)	Exports (as share of GDP)	Exports to high-income countries (as share of GDP)	Exports to low- and middle-income countries (% of GDP)
Instruments	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)
Observations	26	26	26	65	65	66
Internet users	0.7643	0.9098	-0.1456	4.3504**	3.7510**	0.5994
(As % of Population)	(0.40)	(0.65)	(-0.09)	(2.07)	(2.38)	(0.46)
Population	0.0534	0.0258	0.0277	-0.0309	-0.0029	-0.0280***
(Natural Log)	(1.07)	(0.67)	(0.80)	(-0.73)	(-0.07)	(-2.71)
Area	-0.1141**	-0.0697**	-0.0444	0.0248	0.0053	0.0195**
(Natural Log)	(-2.14)	(-2.32)	(-1.34)	(0.76)	(0.17)	(2.43)
GDP per Capita	0.0685	0.0347	0.0338	-0.0214	-0.0202	-0.0012
(000s of US$, PPP adjusted)	(1.10)	(0.61)	(0.84)	(-0.65)	(-0.86)	(-0.05)
GDP per Capita Squared	-0.0012	-0.0006	-0.0007	-0.0001	-0.0001	0.0000
(000s of US$, PPP adjusted)	(-0.84)	(-0.47)	(-0.62)	(-0.07)	(-0.12)	(0.02)
Oil Exporter ◦	0.0089	-0.1882	0.1971	0.1311	0.0756	0.0555
(Dummy)	(0.05)	(-1.41)	(1.40)	(1.51)	(1.11)	(1.10)
Constant	-0.3253	-0.1256	-0.1996	0.3794	0.0855	0.2939**
	(-0.33)	(-0.19)	(-0.22)	(1.13)	(0.27)	(2.54)

**** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.*
Note: Instrument is a dummy variable indicating that data lines are (legally) a monopoly in that country. T-statistics are in parentheses. Standard errors are Huber-White robust standard errors.

low-income countries to high-income countries. According to the parameter estimates, increasing the number of Internet hosts by one per 100 residents would increase exports from developing countries to high-income countries as a share of GDP by 2.2 percentage points. Coefficients on the control variables generally appear similar whether Internet hosts or Internet users are used as a proxy for Internet penetration.

Alternative Instruments In addition to the instrument used above, we also re-estimate the 2SLS regressions using alternate sets of instruments. The main concern regarding the alternate instruments is that they are available for fewer countries and using them sharply reduces sample size. On the other hand, adding additional instruments allows us to test over-identifying assumptions. In the first regressions, we add additional instruments representing whether ISPs and leased lines are provided by legal monopolies in each country (see Table 8). In the regression for exports from high-income countries to other countries, the coefficient on Internet users becomes larger and becomes statistically significant at a 1% significance level. The point estimate suggests that increasing the number of Internet hosts by one per 100 inhabitants, exports to other high-income countries would increase by nearly two percentage points. In the regression for exports from low-income countries to high-income countries, the coefficient remains statistically significant but become smaller than it was when the variable representing monopoly over data lines was the only instrument.

One advantage of adding additional instruments is that it becomes possible to test over-identifying assumptions. Using Hansen's J statistics as the test, the χ^2 (2) statistics are 0.5 (p-value = 0.77) and 3.7 (p-value = 0.15) for exports from high- and low-income countries respectively. Therefore, we fail to reject the null hypothesis that the instruments are exogenous, suggesting that the instruments are appropriate.

As a final robustness check, we replace the instruments with a dummy variable from an alternative source that represents whether ISPs need formal approval to operate in the country. The results are, once again, broadly similar to the results with the other set's instruments, although the point estimate of the parameter is modestly smaller.

Conclusions

Developing countries with higher Internet penetration export more to high-income countries than do developing countries where penetration is lower. However, they do not appear to export more to other developing countries and high-income countries with greater Internet penetration do not appear to export more to either developing or developed countries. These results make intuitive sense. First, Internet access is so common among manufacturing enterprises in high-income countries that differences in the number of Internet users (or hosts) as a percent of the population probably reflects differences at the consumer, rather than the enterprise, level in developed countries (i.e., most manufacturing enterprises will be connected to the Internet in developed countries). In developing countries, contrarily, many manufacturing enterprises remain unconnected (see Table 1). Second, because Internet access is less common in developing countries than in developed countries, being connected to the Internet would seem to be a greater advantage for enterprises in developing countries with respect to exporting to developed countries (i.e., to countries where their counterparts are likely to have access).

Finally, because of strong regional differences in income, and taking into account the fact that most exports from developing countries to other developing countries will be within the same region, communication costs will presumably be greater (and therefore Internet access a greater benefit) for exports to distant developed countries than it would be for exports to neighbouring developing countries. The results are robust to controlling for the possibility that Internet use is endogenous

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Table 7: Effect of Internet Use on Exports from Developing Countries to High-income Countries with Additional Control Variables Included in the Analysis

Sample	Developing Countries			
Dependent variables	Exports to high-income countries			
Instruments	Monopoly for data lines (Dummy)			
Observations	65	63	65	65
Internet users	3.9135**	4.4399**	3.9014**	3.7120**
(As % of Population)	(2.27)	(2.14)	(2.23)	(2.45)
Population	0.0052	0.0004	-0.0073	-0.0031
(Natural Log)	(0.15)	(0.01)	(-0.16)	(-0.07)
Area	0.0011	0.0045	0.0071	0.0061
(Natural Log)	(0.04)	(0.11)	(0.21)	(0.19)
GDP per Capita	-0.0169	-0.0291	-0.0199	-0.0187
(000s of US$, PPP adjusted)	(-0.62)	(-1.01)	(-0.86)	(-0.88)
GDP per Capita Squared	-0.0003	0.0001	-0.0001	-0.0002
(000s of US$, PPP adjusted)	(-0.21)	(0.11)	(-0.09)	(-0.21)
Oil Exporter ▫	0.0613	0.0993	0.0679	0.0730
(Dummy)	(1.27)	(1.26)	(1.05)	(1.15)
Member of WTO	-0.0023			
(Dummy)	(-0.03)			
Member of WTO Agreement on Telecoms	-0.0558			
(Dummy)	(-0.68)			
Average Tariff Rate		0.0038		
		(0.79)		
Political Openness			-0.0197	
(higher values mean more open)			(-0.61)	
Remoteness				-0.3232
(Average Distance from markets)				(-0.25)
Constant	0.0220	0.0030	0.1249	0.2273
	(0.08)	(0.01)	(0.34)	(0.31)
R-Squared	-0.20	-0.42	-0.21	-0.15

**** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.*
Note: T-statistics are in parentheses. Standard errors are Huber-White robust standard errors. ▫ Oil Exporters are countries for whom oil makes
up more that 30% of exports. High income countries are countries with per capita income over US$10,000.

(i.e., that causation also runs in the opposite direction). We use a dummy variable representing whether data lines are a monopoly in the country as an instrument for Internet access. Previous work has shown that regulation has a significant impact on Internet access in developing countries (Wallsten, 2003). Since Hausman tests confirm that Internet use is endogenous in some specifications and the instrument is negatively correlated with Internet use, even after controlling for other factors that might affect Internet use, the two-stage approach appears to be appropriate. As a final robustness check, we re-run the regressions using additional instruments related to the regulatory environment. In these regressions, tests of over-identifying assumptions confirm that the regulatory variables are valid instruments. These results strongly suggest that the correlation between Internet use and aggregate exports from developing countries to developed countries is not simply due to enterprises and individuals being more likely to use the Internet in countries that are more open to trade.

The results in this paper do not necessarily imply that causation runs in only one direction (i.e., they do not imply that openness to trade does not affect Internet penetration). Although greater Internet use appears to result in increased exports at the country level, it is possible that causation also runs in the opposite direction. Indeed, the results from the Hausman test for endogeneity suggest that this is the case: Internet use appears to be endogenous in the estimated model.

While trade openness is likely to affect Internet development, our results suggest that causality also runs in the other direction. Even when we endogenise Internet use by using regulatory variables as instruments, we find that Internet penetration in developing countries is positively correlated with exports to developed countries. In other words, our analysis suggests that Internet use may, in fact, help stimulate exports from poor countries to rich. As a result, our analysis suggests that when countries block competition in telecommunications, something that is crucial to Internet development, the country suffers not just in reduced Internet penetration, but also in lower exports to rich countries.

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Table 8: Effect of Internet on Exports to High-income Countries (Robustness Checks)

Sample	Internet hosts replacing Internet users		Additional Instruments		Instrument from Wallsten (2003)
	High-income countries	Developing countries	High-income countries	Developing countries	Developing countries
Dependent Variables	Exports to high-income countries	Exports to high-income countries	Exports to high-income countries	Exports to high-income countries	Exports to high-income countries
Instruments	Monopoly for data lines (Dummy)	Monopoly for data lines (Dummy)	Monopolies for data lines, leased lines and ISPs (Dummies)	Monopolies for data lines, leased lines and ISPs (Dummies)	Entry restrictions for ISPs (Dummy)
Observations	26	72	25	48	26
Internet hosts	-0.2165	2.2103**			
(per 100 Population)	(-0.67)	(2.20)			
Internet users			1.9507***	2.3222***	1.7642**
(As % of Population)			(3.62)	(2.71)	(2.47)
Population	-0.0052	0.0059	0.0420	0.0387	0.0471
(Natural Log)	(-0.14)	(0.17)	(0.81)	(1.51)	(1.26)
Area	0.0350	-0.0022	-0.0828***	-0.0255	-0.0315
(Natural Log)	(-1.02)	(-0.08)	(-3.06)	(-1.15)	(-1.27)
GDP per Capita	-0.0431	0.0175	0.0370	-0.0158	-0.0182
(000s of US$, PPP adjusted)	(-0.41)	(1.25)	(0.45)	(-0.82)	(-0.69)
GDP per Capita Squared	0.0017	-0.0017*	-0.0009	0.0007	0.0009
(000s of US$, PPP adjusted)	(0.61)	(-1.72)	(-0.48)	(0.63)	(0.58)
Oil Exporter ◦	-0.2318	0.0330	-0.2369*	-0.0097	0.0396
(Dummy)	(-1.34)	(0.59)	(-1.81)	(-0.21)	(1.10)
Constant	0.9820	0.0005	-0.4880	-0.2057	-0.2649
	(0.77)	(0.00)	(-0.47)	(-1.08)	(-0.72)
Hansen's J-Test	-	-	0.52	3.73	-
(p-value)			(0.77)	(0.15)	
R-Squared	0.30	-0.12	-0.87	0.51	0.62

**** Sig. at 1% level ** Sig. at 5% level * Sig. at 10% level.*
Note: T-statistics are in parentheses. Standard errors are Huber-White robust standard errors. ◦ Oil Exporters are countries for whom oil makes up more that 30% of exports. High income countries are countries with per capita income over US$10,000.

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Shanghai Conference on Poverty Alleviation Benefits from Developing Country Case Studies[1]

At the Shanghai Conference on Poverty Alleviation, held from 25-27 May and sponsored by the Chinese government with the World Bank, developing countries stressed the need to learn from success stories in reducing poverty, while avoiding dogmatic attitudes. Moreover, during the Conference it was highlighted that achieving the Millennium Development Goals (MDGs) will depend not only on increasing resources but also on renewed commitment to adapt and accelerate implementation of successful approaches.

A broad range of participants, including Heads of State and government, Ministers and representatives of developing and developed countries, heads and representatives of international agencies, and participants from the private sector and civil society met in Shanghai to:

- Take stock of the current state of global poverty reduction and human development;
- Share insights on the key factors underlying successful results and scaling-up of growth and poverty reduction, drawing upon case studies, field visits and global dialogues undertaken preparatory to this Conference; and
- Identify practical measures required to accelerate growth and progress in poverty reduction to give impetus to the implementation of the previously agreed agenda of global poverty reduction.

During the Conference, World Bank President James Wolfensohn argued that although the international community has the knowledge and resources to meet the MDGs on poverty reduction, it will not be an easy task. More specifically, he stated that "results will depend on increasing resources and a renewed commitment to adapt and accelerate implementation of successful approaches".

During a year-long global learning process on scaling up successful efforts to reduce poverty around the world, practitioners and experts from the developing world prepared 100 cases – 11 on how countries have accelerated national poverty reduction through implementing growth-stimulating economic policies, and 89 on interventions to increase poor people's access to education, roads, finance, markets, water and other services.

Prominent among 18 case studies from South Asia are Karnataka's Bhoomi project, which has computerised the state's rural land records; the Bangalore Agenda Task Force, which has initiated public-private partnerships to improve the quality of life in the city; and the Grameen Bank of Bangladesh, which has set a benchmark in the use of micro credit to fight poverty.

This learning process generated a rich sample of real-life experiences of how countries and institutions have scaled up poverty reduction efforts. Wolfensohn said that while there is no single blueprint or one-size-fits-all solution to reducing poverty, many of the successes arose in part from countries and communities learning from each other, and refining those lessons with adaptation and experimentation.

The conference also revealed that successful large-scale poverty reduction depends on several key factors, including:

"We cannot allow cows in some developed countries to receive two dollars in subsidies every day while half of the people in the world must survive on even less than that".

- Poor people as agents of change and assets for development solutions;
- Sustained political commitment and visionary leadership, with continuity over time;
- Transparency and accountability to cut corruption;
- Continuous exchange of knowledge and practical ideas on how to achieve large-scale results;
- Consistent management, innovation, learning, flexibility to adapt to changes; and
- Partnership between all stakeholders.

In addition, and drawing upon these case studies, four factors were identified as common to successful experiences of scaling up poverty reduction.

- *Institutional change*. Changing institutions – that is, rules, norms, behaviours, and organisations – is at the heart of sustained economic growth and successful interventions targeted to providing services such as education and health to poor people.
- *Experimentation and learning*. Successful change typically requires a process of experimentation, adaptation and learning.
- *Political leadership and commitment*. Because institutional change is difficult, risky and a long-term process, it requires sustained political commitment, typically from a broad coalition of interest groups.
- *Supportive external environment*. Change is often stimulated by some kind of external shock, and long-term success is facilitated by a supportive external environment (a peaceful region, a stable global economy, thoughtful and predictable external assistance, expanding foreign trade and investment).

At the Conference, China and Brazil joined forces in demanding a better deal from rich nations on trade and also increased aid. Calls by China's premier Wen Jiabao and Brazilian President Lula da Silva for freer trade, especially in farm goods, were echoed almost uniformly by conference participants.

"We cannot allow cows in some developed countries to receive two dollars in subsidies every day while half of the people in the world must survive on even less than that", said da Silva. The Brazilian president also described poverty as "the worst of all weapons of mass destruction", a reflection of another of the conference's themes, namely the over-expenditure of money on arms at the expense of development aid.

Sources:

DevNews, "Conference on poverty reduction in China issues Shanghai Agenda". 28 May 2004.

DevNews, "Lessons from Shanghai". 1 June 2004.

Financial Times, "China and Brazil demand better deal on trade and aid from rich nations". 27 May 2004.

[1] This is a revised version of the article *Shanghai Conference Identifies Key Factors in Large-scale Poverty Reduction*, which was first published in the EU-LDC Newsletter of 2 June 2004. Please visit www.eu-ldc.org for the full article. The EU-LDC Network provides information, analysis, and views on trade, investment and aid between the EU and developing countries. Excerpts from the paper *Lessons: Scaling Up Successful Efforts to Reduce Poverty*, prepared by Mohini Malhotra, Advisor, World Bank Institute, have also been included.

WORLD TRADE WATCH

UNCTAD XI Ends with Renewed Commitment to 'Development'[1]

The 11th Session of the United Nations Conference on Trade and Development (UNCTAD XI) ended with a renewed commitment on the part of large developing countries to accommodate the interests of the least developed countries by providing preferential market access, among other initiatives.

The Conference, held in São Paulo, Brazil from 13-18 June, adopted three declarations: the Spirit of São Paulo, the São Paulo Consensus and a Declaration launching the third round of Generalised System of Trade Preferences (GSTP) negotiations focusing more on enhancement of South-South trade.

On the closing day, a meeting was held on the Joint Integrated Trade Assistance Programme (JITAP) for least developed countries (LDCs). It called for the reinforcement of synergies between the private sector, civil society organisations and national/regional institutions to achieve better human and institutional capacity building in LDCs. JITAP was launched in 1996 during the 9th Session of UNCTAD in SA. One of the major purposes was to help poor countries assess the impact of the WTO agreements on their economies and to build the necessary capacity to formulate policies and programmes for tapping the opportunities of a rules-based multilateral trading system.

The Spirit of São Paulo Declaration recognised that "improved coherence between the international monetary, financial and trading system is fundamental for sound global economic governance". The UNCTAD Member States expressed their commitment to "improving the coherence between those systems to enhance their capacities to better respond to the needs of development". They agreed to "continue working on the creation of positive synergies between trade and finance and on how to link these efforts to development". It reiterated the Members' commitment to support UNCTAD in fulfilling its mandate as the focal point within the UN for the integrated treatment of trade and development.

On the other hand, the São Paulo Consensus contains issues relating to policy analysis and necessary responses with respect to the four sub-themes of the Conference:

- Development strategies in a globalising world;
- Building productive capacities and international competitiveness;
- Assuring development gains from the international trading system; and
- Partnership for development.

In the process of adopting this consensus, the contentious 'policy space' issue emerged. Many developing countries argued for such space and flexibility to carry out national development policies. They cited examples to buttress their point that such policy space had recently been constrained by international rules and in future may become further narrowed. However, the consensus finally stated that "it is particularly important for developing countries, bearing in mind their development goals and objectives, that all countries take into account the need for appropriate balance between national policy space and international disciplines and commitments".

Another significant development was a call made by Brazilian President Luiz Inácio Lula da Silva to establish a global fund to eliminate hunger through taxing arms trade and financial transactions.

At the closing session, UNCTAD Secretary-General Rubens Ricupero said: "Human development is an invisible part of economic development. Although UNCTAD doesn't have powers like many other inter-governmental and multilateral organisations, it has the power of ideas, commitment and faith."

The Conference also adopted a Note on Multi-Stakeholder Partnerships, recognising the role of NGO[2]s. Among others, it contains a reference to capacity building on trade issues.

Prior to UNCTAD XI, CUTS had organised an Afro-Asian Civil Society Seminar in New Delhi titled *From Cancún to São Paulo: The Role of Civil Society in the International Trading System*. A document containing the proceedings and papers of this Seminar was released at São Paulo. An Afro-Asian Civil Society Statement on Trade, endorsed by several civil society organisations, was presented at São Paulo. The Statement calls on the international community to take forward the recommendations on trade and development issues, including South-South trade.

Regarding the Partnership for Development – one of the sub-themes of UNCTAD XI – the Statement urged that such 'partnerships' should be based on facilitating:

- The relationship between civil society and governments, so that they can engage constructively;
- The process of dialogues and consultations between and among civil society and other stakeholders; and
- The co-management of joint programmes.

[1] This article was originally published by Consumer Unity & Trust Society (CUTS) International as part of a series of six press releases on UNCTAD XI. The organisation also plans to release a brief report shortly, highlighting the major outcomes of UNCTAD XI. Please visit http://www.cuts-international.org for more information.

[2] Non-governmental organisations

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Trade and Industrial Policy Strategies (TIPS).

Contact TIPS:
Ground Floor, Broll Place
Sunnyside Drive
Sunnyside Park
Parktown
Johannesburg

P O Box 87643
Houghton
2041

Tel: +27 (0)11 645 6404
Fax: +27 (0)11 484 4115
Web: www.tips.org.za

To be placed on the mailing list for the TIPS Trade and Industry Monitor, please contact Matthew de Gale at
Tel: +27 (0)11 645 6404, Fax: +27 (0)11 484 4115 or E-mail: matthew@tips.org.za

For information about and contributions to this publication, please contact Lucille Gavera: Publications Manager, TIPS,
E-mail: lucille@tips.org.za or Tel: +27 (0)11 645 6404, Fax: +27 (0)11 484 4115

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