Can FTAA suspend the law of gravity and give the Americas higher growth and better income distributions?

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I. Introduction

In this paper we explore three related ideas:

1. The *export sector* is the fundamental source of both wealth and inequality: You are what you export. Exporting manufactures has been essential for high incomes and low levels of inequality. Exporting crops and raw materials comes with low incomes and unequal income distributions.
2. The *mix* of exports is determined by three fundamentals: *Resources*, *Remoteness*, and *Climate*. Manufacturing likes cool climates, an educated workforce, and locations close to the high-wage marketplaces of Europe and North-America.
3. The *volume* of exports and the wealth formation that comes from the export sector can be impeded by inward looking, isolationist policies. Governments can affect the export mix only slightly and mostly through policies that alter the effects of the fundamental drivers, for example, by encouraging the formation of institutions that make a country effectively closer to global marketplaces.

With this as a framework, the Free Trade Area of the Americas (FTAA) agreement can have two effects. It can set free the fundamental determinants of exports (resources, location and climate) and allow the participating countries to become "all they are capable of being." This is not necessarily entirely good news for Latin America, whose abundant resources, far-away locations and tropical climates tend to support relatively low per capita incomes and unequal income distributions. But, more optimistically, the FTAA may also bring Latin America closer to global GDP, both by supporting higher per capita GDPs in the region (thus lifting the region by its own bootstraps), and also by the creation of institutions that have the effect of making Latin America closer to the high-wage marketplaces of North America.

The first part of this paper presents our view about the fundamental determinants of wealth and inequality. In the second part we assemble a body of evidence, much of which suggests that far-away resource-abundant tropical countries have great difficulties attracting manufacturing activities, other than mundane and labor-intensive tasks like sewing hems on t-shirts. Communities that cannot attract the human-capital-intensive tasks in manufacturing or the human-capital-intensive tasks in the services of the post-industrial age (e.g. digital entertainment and financial management and business consulting) are destined to have low per capita incomes and uncomfortable levels of inequality.

To assemble the evidence, we have cast our data net broadly, and use a comprehensive dataset including data on countries' trade, outputs, inequality, production resources, climate, and location. Finally, in the third section, we use the framework and the evidence to offer an opinion regarding what impacts the Free Trade Area of the Americas agreement may have on export patterns, income, and inequality in the region.

We find in the data considerable support for the idea that exports are symptoms of the process of wealth accumulation and distribution. Exporters of machinery and chemicals tend to have high per capita incomes while exporters of tropical agriculture have per capita incomes that are on average more than 80% lower. Moreover, because exporters of machinery and chemicals have a large fraction of their wealth invested in human capital, their incomes are generally equally distributed, while exporters of agriculture and natural resources have incomes that are quite concentrated.

The data also support the idea that location, resources, and climates are key exogenous determinants of the export composition of the countries. Capital intensive manufacturing activities, for example, are not performed in hot climates or in remote parts of the globe.

We thus offer a fundamental explanation for the economic dilemma facing the region. With respect to the possible effects of the FTAA agreement on incomes and inequality, our analyses indicate that a substantial impact should not be expected. Even though the removal of the existing trade impediments should bring the region "closer" to the world markets, most of the countries in the region will still be too far away to be able to perform the complex tasks that are associated with high incomes and equality, not to mention that the agreement will have no impact on climates.

We are certainly not the first to propose a link between physical geography and economic development. References about such a possibility date back at least to Machiavelli (1519). Gallup, Sachs, and Mellinger (1998) indicate four major areas where it's been suggested that physical geography may have a direct impact on economic productivity: *transport cost, human health, agricultural productivity, and proximity and ownership of natural resources.* In that paper, as well as in Sachs (2001), empirical evidence is provided supporting that geography indeed has direct, as well as indirect, effects on economic development. Hall and Jones (1999) and Engerman and Sokoloff (1997) propose additional ways that physical geography may affect economic development by shaping the countries' institutions. Acemoglu, Johnson, and Robinson (2001), Rodrik, Subramanian, and Trebbi (2002) and Easterly and Levine (2002) go one step further suggesting that once controlled for the effects through institutions geography has no direct impact on economic development. However, McArthur and Sachs (2001) show that the results in Acemoglu et al. (2001) are not robust to increases in the sample of countries used in the analyses.

This literature misses, we suggest, the two primary mechanisms that make geography so important. First, as explained in Leamer(2001), the fixed costs of expensive capital equipment need to be covered by operating the equipment at high pace for long hours. This creates a distinct disadvantage for the tropics. Second, as explained in Leamer and Storper (2001), the exchange of complex uncodifiable messages can only be done on a face-to-face basis with the participants within a handshake of each other. Vast improvements in transportation and communication technologies over the last half century, which might have rendered geography less relevant, have not done so, since these technologies have not improved the long-distance exchange of ideas and commitments. Thus the production of the ideas and the production of the new products remain tightly clustered, leaving much of manufacturing firmly "rooted" where it is, in the United States and Europe. Apparel and footwear are footloose. Machinery and pharmaceuticals are not.[1]

II. A view about the process of wealth creation and distribution

A. Exports are the most important source of wealth and inequality

Wealth is primarily generated by exports. This isn't true for the globe overall, since so far the Moon has been a recipient of very few exports. It is very true for individuals in advanced developed countries, who, because of a very fine division of labor, "export" almost 100% of what they produce. (How much economics does an economics professor consume?) Between the globe and the individual are very few large countries, which, like the globe overall, experience internally driven growth. A prominent example is the United States during the Internet Rush from 1997 to 2000, with growth driven internally by a mad dash

[1] Our paper is also related but different than the so called "New Geography" literature summarized in Fujita, Krugman, and Venables (1999). This literature deals with how increasing returns to scale, agglomeration economies, transport costs, and product differentiation can affect the way economic activity is spatially organized, even when physical geography is undifferentiated. Even though recent developments by Strauss-Kahn (2001), Venables and Limao (2002), and Redding and Schott (2002) incorporate some physical geography into the picture the mechanisms we suggest are very different.

for the Web. But most countries are more like individuals than the globe. Their production structures are specialized and their growth comes from expanding efficiently the activities they are good at, and exporting the surplus to the rest of the world.

Compensation for various kinds of inputs varies greatly depending on the export mix. Raw labor power and human capital are widely owned, but where human capital is poorly rewarded compared with other capital assets, ownership of the most important productive inputs tends to be concentrated on the few. Thus: Find out what a community exports and why, and you are 90% of the way toward understanding its per capita income and its degree inequality.

Table 1 offers a classification of exports that is intended to capture our ideas about wealth and inequality. The table identifies eight different categories of exports in which communities might specialize, and the kinds of capital and other assets needed to produce these items. There are five broad groups of products/services: (a) products made with raw labor only; (b) primary products and crops, (c) distribution services, (d) manufactures, and (e) intellectual services. The inputs needed to produce these items fall into the usual three broad categories of land, labor and capital. The raw labor inputs are physical and mental exertions. Capital takes the form of equipment, skills, knowledge, experience, reputation and human networks, the latter being critical inputs into the activities of distribution, finance and the creation of ideas and content (think Hollywood). Land includes the usual mineral resources and fertile cropland, but also location (closeness to sources of inputs and closeness to markets).

The last two columns indicate the level of incomes and inequality that are typically associated with communities that specialize in these activities. Inequality is determined largely by the ownership of the productive inputs. Of these assets, it is only the human skills created by training that are broadly owned and it is only those communities with economies heavily skill-based that have equal incomes. That means manufacturing. In contrast, land, physical capital, and human ability are assets with concentrated ownership. Thus countries that export primary products and crops and ideas and content have unequal incomes.

Table 1 Export Classifications

A Classification of Economies by their principal exports

Export Group	Export Example	Capital Assets	Other Assets	Incomes	Inequality
Products of Unskilled Labor					
1 Handmade goods	Handicrafts, hand-made textiles	None		Low	Low
Natural Resource Based Primary Products and Crops					
2 Raw materials and crops	Coffee beans, logs	Permanent Crops, Equipment	Land	Low	High
Distribution					
3 Distribution Services	Shipping, warehousing	Distribution Networks, infrastructure	Location	Moderate	Moderate
Manufacturing and Food/Resource Processing					
4 Footloose manufacturing	Apparel, footwear	Equipment, Skills		Medium	Low
5 Processing	Food products, lumber, paper	Equipment, Skills	Closeness to inputs	Medium	Low
6 Noncodifiable manufactures	Pharmaceuticals	Equipment, Knowledge	Agglomerations	High	Moderate
Intellectual Services					
7 Financial Services	Investment Banking	Trust Networks	Instincts	High	Moderate
8 Ideas and Content	R&D, entertainment, marketing, design	Experience, Reputation, Idea Networks	Ability	High	High

B. Wealth and inequality in resource-based, industrial, and post-industrial communities.

In the schema in Table 1, natural resources support three kinds of activities: (a) extracting/growing, (b) processing and (c) distribution. In the extracting/growing economies, capital is embodied in permanent crops (coffee plantations), in cleared, irrigated and otherwise improved land, in transportation systems, and in housing. These activities require very little human capital, and wealth comes from an abundance of natural resources. Then income inequality is determined by the distribution of ownership of the natural resources, which is usually very unequal. Human capital plays a greater role at distribution centers and processing locations, which often are close to the natural resource. At these distribution locations, incomes are often higher and more equally distributed.

Global trade prior to the industrial revolution was mostly the exchange of handicrafts, raw materials, foodstuffs and distribution services. With the dawn of the industrial age, the nature of global trade shifted to manufactured products, led by textiles and footwear and apparel. While much of manufacturing capital even at the beginning of the 20th Century was structures, the shift in favor of equipment has been very substantial. In the investment boom of the 1990s, the ratio of investment in producer durables and software relative to structures rose to a record high of 3-to-1.

The operation of the equipment requires human capital, and most capital in the industrial communities is embodied in equipment and humans skills. Ownership of the equipment can be and often is highly concentrated, just as the ownership of natural resources. Ownership of human skills, however, by its essential nature, is necessarily broad. The equipment of the industrial age, like a forklift, requires trainable skills that depend very little on native ability. Thus on the factory floor the return on human capital investment is high and pretty much the same for everyone.

If it doesn't matter much who operates a forklift, it matters greatly who types on a computer keyboard. Thus like the industrial age, the post-industrial age has services produced with a combination of equipment (recording studios) and human capital (singing skills). While manufacturing requires trainable skills, the post-industrial activities of finance and innovation require knowledge and understanding. Unlike the industrial age, in the post-industrial age the rate of return to investments in human capital varies greatly from individual to individual. (You cannot teach me to sing, I am sorry.) This brings with it a concentration of capital in the hands of the few and inequality levels that are reminiscent of the pre-industrial age.

C. In the Industrial Age, wealth has come especially from exporting manufactures

Not all countries are equally well suited to compete in manufacturing, and some countries in the industrial age remain as suppliers of raw materials and foodstuffs. These activities have not been technologically stagnant. On the contrary, both agriculture and resource extraction have experienced an increase in mechanization that closely parallels progress in manufacturing.

Mechanization of agriculture and raw material extraction is similar but also different from mechanization of manufacturing activities. It is similar in the sense that it puts into the hands of workers expensive equipment that needs to be operated for long hours at high pace to cover the capital costs. This creates high-effort high-wage opportunities for workers with some formal education. It is similar in the sense that it lowers the labor to output ratio. The difference is that agriculture and resource extraction have a fixed input: land. Mechanization lowers the worker to land ratio and thus reduces the number of jobs in agriculture. In manufacturing the number of jobs can be maintained or even increased in the face of increased mechanization provided that manufacturing can attract the needed amount of capital.

For example, the United States experienced a sharp drop in its agricultural workforce over the 20th Century but an increase in its manufacturing workforce. In 1900, 10 million agricultural workers comprised 40% of the workers. In 1970, only 4 million farm jobs remained comprising only 5% of the workforce. Meanwhile, manufacturing jobs increased from 5 million to 20 million, rising from 20% of the workforce to 30%.

This rise in the proportion of jobs in manufacturing cannot be explained only by the absence of a fixed factor, since consumers, facing a fixed set of products must eventually become satiated: how many horse-drawn carriages can you possibly desire? With a fixed product mix the return on capital in manufacturing would have surely fallen to a level too low to attract more investment, and jobs would have expanded instead in services. If we today had the same mix of products as in 1900 – no automobiles, or refrigerators, no televisions, no personal computers, etc., etc. - we surely would have a much smaller global workforce in manufacturing. But the 20th Century has experienced wondrous product innovation that has paralleled the process innovation. Thus the fundamental reason for the expansion of the global manufacturing jobs in the first seven decades of the 20th Century has been product innovation.

The difference between agriculture and manufacturing should alarm exporters of natural resource based products, processed or otherwise. Countries that cannot attract manufacturing activities face the very difficult problem of how to find work both for the new entrants into the labor force and also for the natural resource workers who are inevitably displaced by mechanization.

D. Manufacturing is done in cold climate, close to markets and separated from agriculture

The ability of a country to attract manufacturing is determined by three features:

1. Resources
2. Location
3. Climate

Manufacturing prefers cold climates where equipment can be operated without breakdowns at high pace for long hours during the day. Manufacturing seeks stable real exchange rates and an educated workforce, neither of which are offered by natural resource rich countries. And many manufacturing activities prefer to cluster next to like activities and close to the high-wage markets of North America and Europe and Japan.

1. The transition from pre-industrial to industrial is difficult for natural resource rich countries

The conceptual framework that we use for thinking about these issues is a three-factor (land ,labor and capital), multi-good, Heckscher-Ohlin model with variable effort levels which looks like technological differences. This framework suggests that abundance of natural resources is helpful in the pre-industrial age but can be a hindrance toward progress in the industrial age. Natural resource rich communities invest their scarce savings mostly in improvements in land, in permanent crops, and extractive equipment and very little in human capital, which has a very low return on a coffee plantation or the equivalent. This creates a barrier to development since once the resource is fully developed and further wealth accumulation could come only from growing manufacturing, the educational system may not be ready to prepare the workforce for jobs on the factory floor. Equipment may then seek workers in other communities that have the literacy skills and work ethics needed in the command-and-control hierarchical organizations that lead the global competition in manufacturing.

There are some notable exceptions to the hindering effects of natural resources in the northern regions of Europe (Finland and Sweden) and North America (Canada). The comparison between Latin America and these northern softwood producers may not be completely meaningful. Softwood logs are different from coffee, since wood processing can extend from sawing to the much more human and physical-capital intensive operations in pulp and paper. Food processing is more limited in scope and may not support extensive investment in human capital. Secondly, as we will argue more below, manufacturing likes cold weather, which is in abundant supply in Canada, Finland and Sweden, but very scarce in Latin America. Also, these softwood producers may be different from Latin American countries with regard to human capital formation, since these northern countries may have made a heavy commitment to broad human capital accumulation for non-economic reasons prior to the period when the private rate of return to human capital exceeded the private rate of return to physical capital. Furthermore, these softwood producers sit right on top of the attractive markets in Europe and North America, while Latin America is far away. For that reason, and others, educational investments may not have a sure payoff. Indeed, Argentina, a formerly wealthy natural resources exporter still had substantial measured human capital accumulation, but nonetheless did not manage to make the transition to an industrial economy,.

2. Climate: equipment doesn't like hot humid areas.

The shift from the Agrarian Age to the Industrial Age came with a movement of wealth creation from the Mediterranean climates to cooler climes, for two reasons. First, there is a fundamental difference in the technology of agricultural production and the technology of manufacturing. A field can be tended by many or by few, and adding another worker doesn't affect the productivity of the others. Two lazy workers equal one productive worker. But a machine can be tended by only one worker. The output of a machine at the end of the day depends on the speed of work, and the attentiveness of the worker. The owner of a farm doesn't much care if there are a few unproductive workers or one productive worker– they can be paid on a piece rate system - since in the end the land commands the same rent. But the owner of an expensive machine cannot use a piece rate system because a lazy worker may not produce enough output to cover the cost of the machine.. (See Leamer(1999))

The need to spread the fixed cost of capital over a large labor input makes industrial equipment and factories seek climates in which the equipment can be operated for long hours during the day at high speeds. The problems confronting manufacturing in the tropics are many. Human effort and attentiveness are hard to maintain for extended periods of time in hot and humid climates, and machines break down more frequently. It is only with the advent of air-conditioning that manufacturers started moving "south" in search of low wages, but in these hot and humid climates workers must, in effect, rent the equipment, and pay the added capital costs for the air-conditioning, and the marginal operating costs as well. This keeps a permanent gap between wages in the "North" and wages in the "South."

3. Location: communication of complex ideas requires face-to-face meetings

Both the industrial age and the post-industrial age require workers to master complex new tasks that the new equipment and new products demand. Leamer and Storper(2001) argue that this human capital is created only by close human interactions (watching the master), a communication technology which dictates the geographic concentration of innovative manufacturing. While great improvements in transportation and communication technologies have made it much cheaper to transport goods and codifiable messages, these technologies help very little in the transshipment of uncodifiable knowledge. Only when products mature and become standardized can the knowledge of how to produce them be codified in words and blueprints and sent to remote locations where the products can successfully be made. The productive activities at these remote locations tend toward the mundane and the repetitive, and thus require much less human capital than the innovative activities done at the great centers of both the industrial and post-industrial ages. Without broadly owned human capital, these remote locations may have greater inequality than the centers of the industrial age.

4. Location: Enforcement of contracts is best done in close proximity

In addition to allowing the transfer of complex messages, closeness can be important for the maintenance of guarantees. "Search" goods whose value is transparent from a single inspection can be exchanged through long-distance and faceless transactions. But "experience" goods have value that is revealed only through years of use, and it is essential for the buyer to be able to find the seller in the event that the product does not live up to its explicit or implicit guarantees.

III.Data evidence

Within the time and space limits of this paper, we cannot provide compelling evidence in support of all these ideas, but we can offer some significant support for many.

A. The link between exports, incomes, and inequality

Substantial evidence of "you are what you export" comes in the form of a clustering of countries in terms of their export patterns, and then computing how the average per capita GDPs and average GINIs differ between the clusters. We find, among other things, that exporters of tropical agricultural products have lower per capita GDPs and high GINIs.

Next we report some simple regressions that include more than one export product and also remoteness and trade dependence. Even in this horse race between competing explanations, exporting tropical agricultural products contributes to low per capita GDPs and unequal incomes. After controlling for export mix, being far away doesn't seem to affect GDP per capita but it does contribute to higher GINIs.

1. Clustering of Countries 1987

In **Table 2** we report two groups of countries based on their export shares, first exporters of tropical agricultural products and second exporters of (footloose) labor-intensive manufactures[2]. Exporters of tropical agriculture products rarely export other goods, especially not manufacturing. In contrast, the heterogeneity within the group of exporters of labor intensive manufactures is the largest among any of the groups (except the mixed comparative advantage group that is precisely defined based on its heterogeneity). Interestingly there are countries in this group that also export capital intensive manufactures or machinery, but at the same time there are tropical agriculture exporters.

[2] There are nine clusters in all. See the website at WWW for more details.

Table 2: Two Clusters of Countries: Exports / Total Trade

	Pet	R. Mat.	For	Trop. Ag.	Anl.	Cer.	Lab	Cap	Mach.	Chem.
Tropical Agriculture Products										
MDG	0	0.03	0	**0.39**	0.09	0.02	0.01	0.03	0	0.01
HND	0	0	0.03	**0.38**	0.05	0.01	0.01	0	0	0
TZA	0.01	0	0.01	**0.28**	0.01	0.13	0.01	0.02	0	0
CRI	0	0	0.01	**0.27**	0.06	0.01	0.04	0.03	0.01	0.02
FJI	0.05	0	0.03	**0.27**	0.04	0.01	0.03	0.02	0.02	0
GTM	0.01	0	0.01	**0.25**	0.02	0.03	0.02	0.03	0	0.04
SLV	0.01	0.01	0.01	**0.25**	0.02	0.02	0.02	0.03	0.01	0.03
GHA	0.01	0.14	0.07	**0.23**	0.02	0	0.03	0	0	0
COL	0.15	0.03	0.01	**0.23**	0.02	0.01	0.06	0.02	0.01	0.02
ECU	0.2	0	0.01	**0.17**	0.12	0.01	0.01	0	0	0
LKA	0.02	0	0	**0.16**	0.01	0.01	0.17	0.02	0.01	0
ETH	0.01	0	0	**0.15**	0.07	0.01	0	0	0	0
CMR	0.06	0.02	0.04	**0.13**	0.01	0.02	0.01	0.01	0.03	0.01
Labor Intensive Manufactures										
HKG	0	0.01	0.01	0.01	0.01	0.01	**0.22**	0.14	0.11	0.02
ISR	0	0.01	0	0.03	0.01	0.01	**0.16**	0.07	0.08	0.06
DOM	0	0	0	0.09	0.01	0.02	**0.15**	0.06	0.02	0
PRT	0.01	0	0.06	0.02	0.01	0.01	**0.15**	0.06	0.07	0.02
IND	0.02	0.02	0	0.05	0.03	0.03	**0.15**	0.1	0.03	0.02
MLT	0.01	0	0	0	0	0.01	**0.14**	0.06	0.1	0.01
THA	0	0.01	0.01	0.1	0.06	0.06	**0.14**	0.05	0.05	0.01
PHL	0.01	0.05	0.03	0.06	0.03	0.05	**0.13**	0.03	0.11	0.02
TUN	0.09	0.01	0	0.02	0.02	0.02	**0.12**	0.03	0.03	0.08
TUR	0.01	0.02	0.01	0.06	0.02	0.03	**0.11**	0.09	0.05	0.03
GRC	0.02	0.02	0	0.05	0.01	0.05	**0.09**	0.06	0.01	0.01

Now that we know what they export, what are they like? Is it true that "you are what you export"? Table 3 reports average per capita GDPs and average GINIs for each of these groups of countries. These are sorted by per capita GDP. At the top with high per capita GDPs and low GINIs are exporters of animal products and exporters of machinery and chemicals. At the other end with low per capita GDPs and unequal incomes are the exporters of tropical agricultural products and cereals, and petroleum and raw materials. Exporting labor-intensive manufactures helps some, but not very much. .

Table 3: summary statistics by country group

Country Group	Obs.	Per Capita GDP	Gini
Animal Products	2	12731	36
Machinery, Cap, and Chem.	10	**11999**	**32**
Forestry but also Machinery	4	**11838**	**35**
Mixed Comp. Advantage	12	6424	40
Labor Intensive Manufacture	11	4851	41
Raw Materials	8	3759	47
Petroleum	6	3353	40
Cereal	2	3107	54
Tropical Agriculture	13	**1820**	**46**

a) Persistence of Trade Patterns: 1980-1997

Another claim that we have made is that while natural resources are certainly not footloose, neither is much of manufacturing. This leaves countries hoping to develop by stepping up on the first wrung of the ladder of manufactures all scrambling to attract the small segment of manufacturing that is footloose.
Table 4 reports the correlation of 1980 and 1997 export shares and net exports relative to total trade. The products are sorted from most to least persistent. At the top of the persistence chart are the natural resource dependent activities: animal products, raw materials. But exports of machinery are more persistent than exports of petroleum or tropical agricultural products. Chemical are also very persistent. The footloose products are of course: labor-intensive manufactures and what we are calling capital-intensive manufactures (meaning not much human capital). That's textiles and steel.

Table 4: Correlation between 1980 and 1997 export patterns

Products	Exports Share	Net Exports Share
Anl. Products	0.91	0.91
Raw Materials	0.89	0.89
Machinery	0.87	0.83
Petroleum	0.85	0.81
Tropical Agric.	0.84	0.84
Chemicals	0.82	0.75
Forestry	0.81	0.83
Cereals	0.78	0.75
Cap	0.58	0.57
Lab	0.32	0.37

2. Multiple Regressions: 1987

Table 5 reports multiple regressions that explain inequality and GDP per capita in terms of export mix (net exports as a share of total trade), trade dependence and remoteness. The choice of exports comes from trimming out insignificant predictors. This leaves two important trade determinants of income and inequality: machinery and chemicals, good, tropical agriculture, bad.

After controlling for the product mix, trade dependence doesn't matter and remoteness is bad for inequality but doesn't much affect income levels.

The bottom line here is that 60% of the variability across countries in GDP per capita can be explained by trade composition alone. Inequality, as measured by GINIs, is harder to predict, but exporting tropical agricultural products seems undeniably associated with unequal incomes.

Table 5: Joint effects of exports patterns and remoteness

Variable	Inequality	GDP per capita
Net Exports of Trop. Agriculture	35.44	-11403
	(3.25)	**(-2.5)**
Net Exports of Machinery	-17.95	8182
	(-1.92)	**(2.0)**
Net Exports of Chemicals	16.21	55354
	(0.44)	**(3.5)**
Remoteness	0.001	-0.2
	(3.13)	(-0.9)
Trade dependence	-1.53	1704
	(-0.61)	(1.5)
Constant	31.1	9896
	(11.46)	(8.4)
R-Squared	0.48	0.6

B. What determines exports? Resources, Climate and Location.

Given the stability of export patterns and the undeniable correlation between these and incomes and inequality we turn next to the empirical evidence relating exports to their underlying determinants: resources, location, and climate.

1. Location

The gravity model has often been used to study the choice of trade partners but less often the composition of trade, although an exception is Leamer(1997). Table 6 reports the distance component of a gravity model applicable to each of our ten trade aggregates. This shows the distance effect on countries' bilateral trade in different products for 136 countries in 5 different years. Except for the dummy variables the equations were estimated in logs and included the GDP of the countries, a dummy for pairs of countries that speak the same language, and a dummy for pairs of countries that share a common border, in addition to the distance separating them in kilometers.

Table 6 has two important messages. First, distance affects different goods differently. Cereals, tropical agriculture, animal products, and raw materials are the least affected by distance while trade in forest products, petroleum, and manufacturing goods are heavily hurt by distance. Even footloose labor-intensive manufactures has a large negative distance elasticity. Not so footloose after all.

The second message of Table 6 is that the distance effects do not seem to be fading away over time as "globalization" enthusiasts and opponents suggest. For every one of the products in the sample the effects of distance have increased, if anything, from 1982 to 1997.

The substantial and persistent distance effect on manufactures is evidence of one of our important points: any manufacturing that involves complex uncodifiable tasks including the customization of equipment and inputs has a powerful hysteresis effect: it ain't going anywhere.

Table 6: Distance Elasticity from Gravity Equation

Variable / Year	1982	1987	1992	1997
Petroleum	-1.26 (0.07)	-1.13 (.06)	-1.26 (.06)	-1.33 (.05)
Raw Materials	-.88 (.04)	-.77 (.04)	-.96 (.04)	-1.05 (.04)
Forest Products	-1.08 (.03)	-1.05 (.04)	-1.23 (.03)	-1.36 (.03)
Tropical Agriculture	-.70 (.04)	-.66 (.03)	-.82 (.03)	-.82 (.03)
Animal Products	-.73 (.04)	-.77 (.04)	-.86 (.03)	-.81 (.03)
Cereals	-.62 (.04)	-.63 (.04)	-.79 (.03)	-.93 (.03)
Labor Intensive Manufacture	-1.09 (.01)	-1.05 (.03)	-1.03 (.03)	-1.18 (.03)
Capital Intensive Manufacture	-1.06 (.03)	-.99 (.03)	-1.07 (.03)	-1.17 (.03)
Machinery	-1.04 (.03)	-.93 (.03)	-1.00 (.03)	-1.12 (.03)
Chemicals	-1.14 (.03)	-1.18 (.03)	-1.27 (.03)	-1.34 (.03)

* Standard Errors in parenthesis.

It seems surprising that the great rise in global trade in the last several decades has not been associated with a declining distance elasticity. It might be the case that although the marginal effects of distance on trade have not decreased over time the average effect have. The average distance, in kilometers, 1 US$ of different products traveled in different years[3] confirms that goods were not traveling longer distances in 1997 that they were in 1982. Why, then, the big increase in trade compared with GDP? If the globe isn't getting smaller what is happening? The gravity model has the answer: GDP is getting more dispersed. The growth of trade across the Pacific comes from having more equal GDPs in North America and Asia.

[3] Not shown but available online at WWW

2. Resources

The simple gravity model suffers from including no variables that measure comparative advantage. As a consequence, it is possible that too much is attributed to distance. It could be that machinery and chemicals are produced close to markets and tropical agriculture produced in remote areas just because the global distribution of endowments dictates so. Next we deal with both resources and distance at the same time.

The descriptive model that drives this two-step estimation has potential net exports a function of resources P(Resources) but actual trade reduced by a gravity effect: Net Exports/Worker = Potential Trade(Resources/Worker) * Volume Effect(distance, country size). A very rough way of estimating this model is reported here. Table 7 reports regressions of the absolute value of the country's net exports divided by its labor force – a measure of trade dependence - on our measure of remoteness and on the country's GDP a measure of market size (Sombart's Law). As expected, both market size and remoteness reduce the country's trade dependence. We then use these estimated remoteness and GDP elasticities to create an adjustment factor for the net exports of the countries, scaling up the level of net exports to put all countries on an equal footing, in terms of access and market size. The adjustment factor scales up net exports of distant and large countries and scales down the net exports of close and small countries. These adjusted net exports, always scaled by the country's labor force as well, are then regressed against the countries' factor endowments and distance to markets. The results are reported in Table 8**.**

Table 7: Trade Dependence log(ABS(net Exports(i)/Labor)) in 1987

	Pet.	Raw Mat.	For. Prod.	Trop. Agric.	Anl. Prod.	Cereals	Labor Int. Manuf.	Capital Int. Manuf.	Mach.	Chem.
log(distance)	-1.74**	-1.52**	-2.01**	-0.77*	-2.18**	-1.43**	-1.93**	-1.76**	-1.31**	-1.14**
log(GDP)	0.05	-0.09	-0.1	-0.19	-0.22	-0.18	-0.12	-0.23*	-0.25*	-0.17*
Constant	18.7*	18.4*	22.6**	14.2**	26.3**	19.4**	23.1**	23.8**	21.2**	17.3**
Observations	68	68	68	68	68	68	67	68	68	67
R-squared	0.26	0.14	0.28	0.08	0.25	0.18	0.27	0.27	0.2	0.19
* significant at 5%; ** significant at 1%										

Table 8: Comparative advantage.

	Pet.	Raw Mat.	For. Prod.	Trop. Agric.	Anl. Prod.	Cereals	Labor Int. Manuf.	Capital Int. Manuf.	Mach.	Chem.
capital/labor	17360	49197	4398	1743	42674	23802	17554	-4448	-159213*	-19812
capital/labor ^ 2	-167423	-417918	-60420	948	-425622	-220714	-597716	357008	1445048	242139
prim. educ/labor	-87	203	-129	298	-1010	-93	181	-676	1070	-201
sec. educ/labor	-601	1133	-4	56	-702	285	1914	-1757	2566	-414
terc. educ/labor	-1305*	-3098	469	523	3158	-685	-2683	-1066	2299	518
cropland/labor	53	180	-24	19	-237	93	123	-163	102	31
for land/labor	-2.65	8.41	0.82	-2.16	-1.21	-1.63	-5.98	0.16	-2.79	-0.77
pas land/labor	-2.41	-26.02	0.52	-3.32	28.69	-7.36	-20.67	21.49	5.31	2.16
energy/labor	0.23	-0.66	0.01	-0.29	-1.35	-0.45	-0.36	0.11	1.59	0.11
Remoteness	-0.01	**0.19****	0	**0.04****	**0.24****	**0.09****	0.01	**-0.08***	**-0.43****	**-0.05****
Observations	69	69	69	69	69	69	69	69	69	69
R-squared	0.22	0.28	0.05	0.29	0.47	0.35	0.08	0.17	0.44	0.32
* significant at 5%; ** significant at 1%										

Besides the expected effects of endowments in exports, long predicted by the Heckscher-Ohlin model, Table 8 shows that remoteness continues to hurt exports of capital intensive manufacture, machinery, and chemicals. Even after controlling for factor endowments as sources of comparative advantage farther away countries still are in disadvantage producing those goods. The opposite happens to raw materials, tropical agriculture, and animal products where after controlling for endowments the farther away countries seem to have comparative advantage producing it.

3. Climate

An important part of our view about wealth and inequality is that climate influences the activities a country may perform efficiently. It cannot be surprising that tropical agriculture requires tropical climates. That is not the point. The point is that manufacturing, especially the most capital intensive segments, cannot be efficiently performed in hot climates.

Table 9 shows that the data lend strong support to this claim. A regression of the countries' exports per worker against remoteness, standardized to have mean zero and unit variance, and the percentage of the population in tropical, temperate, snow, and other climates indicate that indeed being in the temperate zone is a strong predictor of being able to export manufactures.

Interestingly even after controlling for climate remoteness still hurts the possibilities of a country to export manufacturing, this being particularly true for chemicals, machinery, and capital intensive manufactures.

Table 9: Climate effects on exports per worker in manufacturing (1992).

Climate Zone	Chemicals	Machinery	CAP	LAB
Trop. & Subtrop.	213	568	296	304
Temperate	**877****	**1971****	**1172****	**1415****
Snow	-678	669	-613	-1401*
Other	-58	-128	-101	-114
Remoteness	**-314****	**-701****	**-347****	-233
* significant at 5%; ** significant at 1%				

4. The truly exogenous determinants of incomes and inequality

The evidence presented so far states clearly that endowments, location, climate, export composition, incomes, and inequality are unequivocally linked. There is however a high degree of collinearity among these variables and we may find it difficult to sort out the separate effects, not to mention speak to causal directions. However, we have been able to link the countries' income and inequality measures with their exogenous determinants. It is this link that will be explored when addressing the possible effects the FTAA agreement may have in the region.

Among the variables we expect to be linked to the countries' income and inequality measures we argue that the following are truly exogenous to the process of wealth creation and distribution: *share of area under a given climate zone, remoteness, land endowments, and energy reserves*. Table 10 shows how these variables affect income and inequality in the countries. These are weighted regressions with variance of the residual assumed to be equal to the labor force, thus producing regression estimates analogous to a mean with weights equal to the labor force. There is no constant in the equation because the climate shares add to one. Furthermore, for computing the t-statistics, the mean has been subtracted from dependent variable, and the t-values on the climate proportions test if that climate zone is unusual compared with all the others, not a test if the effect is zero. Finally, the resource variables are standardized to have mean zero and variance one, thus allowing the coefficients on the climate variables to refer to the effect of climate on a country with average endowments and to allow the coefficients on the resource variables to measure the effect of a one-standard error increase. The climate variables int the table have been sorted by the climate effect on GDP per capita and the resource variables by the resource effect. The final columns of the table indicate climate shares of several countries to help make clear what these climate variables represent.

The GDP per capita regression has a successful R^2 of 0.80 and several statistically significant findings. For GDP per capita, the best climate zones are the cold and cool ones (snow humid and temperate humid), climates the US and Sweden "enjoy", but Brazil does not. These climates are associated with per capita GDPs of $19,000 and $12,000. These climates support GDP per capita that are statistically higher than average. In the other direction, the climates that are statistically inferior are tropical dry winter and arid desert. Brazil has the former and Argentina the latter. These climates support GDP per capita of only $2,926 and $1,506 respectively.

Abundance of cropland contributes to GDP per capita. A one standard deviation increase in cropland increases GDP per capita by $2898. Remoteness is not a good thing. A one standard deviation increase in remoteness reduces GDP per capita by $1,828.

The Gini regression is less successful. It has an R2 of only 0.40. But it confirms what we suspect: the climate with tropical dry winter which yields a weak GDP per capita, also yields a high Gini coefficient. A highland climate is also associated with unequal incomes while ice tundra (think Canada and Norway) comes with equal incomes. While remoteness lowers per capita incomes, it doesn't increase inequality. Forestland is estimated to raise inequality. That variable does not distinguish hardwood from softwood

forests and may be reflecting mostly the cutting of tropical hardwoods. Indeed, as can be seen in the data it is Brazil not Sweden that has abundant forestland.

Table 10:

Weighted Regression Estimates: 1987 Data
Weight = Labor^.5
t-stats on climate variables test for differences among the coefficients, not zero.

	GDP Per Capita		GINI						
	Estimates		Estimates		Climate Data				
	Coeff.	t-Stat	Coefficient	t-Stat	Total	Brazil	Arg.	US	Sweden
Climate Shares									
Snow humid	$ 19,082	5.6	48.77	1.33	5%	0%	0%	69%	26%
Temp. humid	$ 12,143	4.8	37.63	-0.34	22%	5%	26%	26%	32%
Snow dry winter	$ 9,590	0.4	68.65	0.95	0%	0%	0%	0%	0%
tropical humid	$ 6,596	0.3	30.86	-1.15	11%	20%	0%	0%	0%
tropical monsoon	$ 4,846	-0.5	46.80	1.09	3%	2%	0%	0%	0%
Temp. Medit.	$ 4,277	-0.8	40.96	0.30	8%	0%	0%	0%	6%
Arid steppe	$ 3,194	-0.6	32.99	-0.40	7%	0%	28%	0%	18%
highland	$ 2,968	-0.9	72.80	2.52	8%	0%	17%	0%	11%
tropical dry winter	$ 2,926	-2.8	49.54	3.11	21%	63%	0%	0%	0%
Temp. Subtrop	$ 1,694	-1.7	27.08	-1.51	7%	10%	12%	0%	0%
Arid desert	$ 1,506	-2.3	36.14	-0.47	8%	0%	16%	0%	4%
ice tundra	$ (18,807)	-1.3	-134.35	-2.93	1%	0%	0%	5%	3%
Resources: Stand. Dev. From Mean					**Resources Data**				
Cropland	2898	4.8	0.48	0.24	0	0.2	1.8	-0.2	0.8
Energy	984	1.8	1.93	1.11	0	-0.3	-0.1	-0.2	0.1
Forestland	-909	-0.6	16.35	2.89	0	0.4	0.0	0.1	-0.2
Remoteness	-1828	-2.3	1.09	0.43	0	0.8	1.3	-1.1	-0.8
R-squared	0.88		0.40						

IV. Possible effects of FTAA on income and inequality in the Americas

This section analyzes the effects that THE FTAA AGREEMENT will likely have on exports, wealth, and inequality in the Americas. We first describe the region's characteristics regarding resources, climates, location, and export patterns, and then we analyze the effects the trade agreement should have on wealth and inequality.

A. Resources, Location, Climate, and Exports in the Americas

Out of the 21 North, Central, and South American countries in our sample 14 of them – all in Latin America - are classified either as exporters of petroleum or raw materials or cereals or tropical agriculture products. Add to that four other countries (Brazil, Uruguay, Panama, and Barbados) that although classified as *mixed comparative advantage* are still heavy exporters of one or more of the goods above and it should not be a surprise the low income and high inequality levels of the region.

Two countries in the region break the patterns and are the only machinery, chemicals, and capital intensive manufactures exporters, the US and Canada. Those are also the only ones with high income levels and relatively equal societies.

Do resources, climate, and location explain the export patterns of the countries in the Americas? That is what we turn to now.

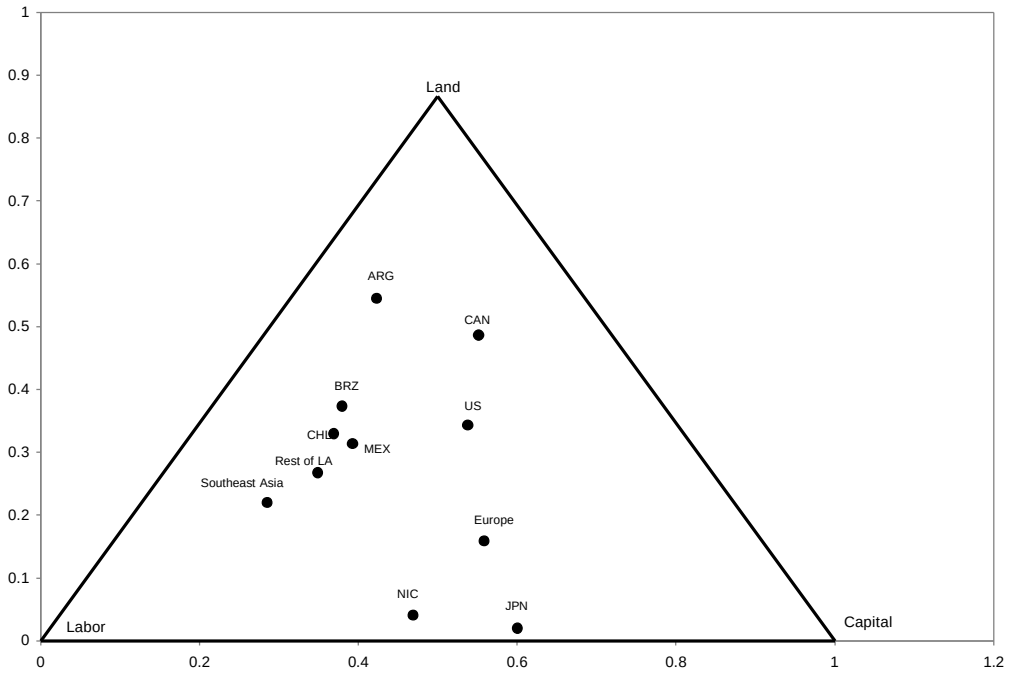
1. Resources in the Americas

Figure 1 shows in a Leamer triangle the capital, labor, and land intensity of some countries in the Americas, together with other countries and regions that are meant to provide relevant comparison basis. In such a displaying device the closer a country (or region) is to one of the vertices the more abundant it is in the resource represented in this vertices. Moreover, countries on the same ray emanating from one of the vertices, say the capital vertex for example, have the same relative intensity of the other two production factors, labor to land ratio in the case of the example.[4].

The message from Figure 1 is clear: the American continent is, by and large, land abundant. Within the region the US and Canada are different by having very high capital per worker measures while the rest of the region is extremely capital scarce.

[4] For a complete description of the properties of the Leamer Triangles, as well as an application, see Leamer (1987).

Figure 1



Using attained educational levels as a proxy for the human capital distribution in the countries[5] it is confirmed that the incentives to accumulate human capital, at least in the form of secondary and tertiary educations, are not present in the non-manufacture exporting economies of Latin America. On the other side the land abundant-well located machinery exporters Canada and the US are very abundant in human capital.

2. Location

In terms of location the American continent can be divided into three groups of countries as shown in Table 11. The first group is composed of Canada and the US, countries with relative positions comparable to the closest countries in the world, the western European economies. In the second group are Mexico and the Central American countries. Those countries benefit from being close to the US and in relative terms are as well positioned geographically as Hong Kong for example. The last group is mainly composed by the South American countries. In this group even the closest countries, like Colombia or Venezuela, are very remotely placed. Remarkably no country in the region became better positioned – in relative terms – in the 15 years period analyzed. At best Canada, Mexico, and Guatemala kept their relative place. In other words, the region is becoming farther and farther away.

[5] Not shown but available online at WWW

Table 11: close, intermediate, and remotely located countries in the Americas

Country	Dist (Km.) 1982	Rank	Country	Dist (Km.) 1997	Rank	Gains Losses
			Close countries			
Canada	2348	6	Canada	2574	6	0
USA	3691	15	USA	4031	19	**-4**
			Intermediate located countries			
Dominican	4674	24	Dominican	5103	28	**-4**
Jamaica	4719	25	Jamaica	5134	29	**-4**
Honduras	5411	30	Honduras	5854	31	-1
Barbados	5445	31	Barbados	5904	32	-1
El Salv.	5480	32	El Salv.	5926	33	-1
Mexico	5513	34	Mexico	5939	34	0
Guatemala	5558	35	Guatemala	6006	35	0
Venezuela	5502	33	Venezuela	6010	36	**-3**
Panama	5753	36	Panama	6219	37	-1
Costa Rica	5784	37	Costa Rica	6229	38	-1
			Remotely located countries			
Colombia	6106	38	Colombia	6596	40	-2
Suriname	6223	39	Suriname	6653	41	-2
Ecuador	6612	42	Ecuador	7104	44	-2
Peru	7785	49	Peru	8250	53	**-4**
Brazil	7918	50	Brazil	8297	54	**-4**
Bolivia	7984	51	Bolivia	8400	55	**-4**
Uruguay	8529	55	Uruguay	8674	57	-2
Argentina	9186	59	Argentina	9529	61	-2
Chile	9344	61	Chile	9673	62	-1

In order to get a sense of the burden of remoteness in the Americas we looked at the share of the world's production in different products that takes place in remote areas of the globe[6]. The world's GDP that is generated in those remote areas provides a meaningful basis for comparison. The conclusion is that in terms of location Latin America seems too far away to be able to efficiently produce manufactures in general. Machinery, electronics, vehicles and instruments are very rarely produced in such remote areas of the globe.

3. Climate

Because of its orientation, north-south, and its large extension the American continent has every type of climate. The vast majority of its land, however, is located between the tropics and therefore is under some sort of tropical climate. Except for Canada, the US, Uruguay, Chile, and Argentina the rest of the countries in the Americas has most of their population living under tropical or subtropical climates[7].

[6] Not shown but available at WWW
[7] For a table with detailed information on this issue see WWW

B. The FTAA effects on the Americas

1. FTAA may pull the region closer

As mentioned before the FTAA AGREEMENT might affect incomes and inequality by changing the region's effective economic location in the world. Regardless of its geographic position one way a country can place itself in a remote area of the globe is by adopting isolationist policies. That indeed may be argued to be the history of most of the Latin American countries. The adoption of the Free Trade Area of the Americas agreement may pull the region effectively "closer" by eliminating trade impediments.

In order to evaluate if such a mechanism should have a significant impact on the region we start by asking if there is scope for the FTAA agreement to bring the region closer to markets. If the countries in the region trade considerably less than what is expected for countries of equivalent sizes and remoteness, lifting trade impediments may indeed have a large effect. If, however, they trade pretty much what would be expected from them the scope of the liberalizing measures should be limited.

The equations estimated in Table 7 can help answering this question. We re-estimate these equations with a dummy for Latin American countries and the results are shown in Table 12. It turns out that the Latin American dummy variables are not significantly different from zero thus suggesting that trade impediments have not made the region more remote than geography alone dictates.

Table 12: Dependent variable: log(ABS(net Exports(i)/Labor)) in 1987

	Pet.	Raw Mat.	For. Prod.	Trop. Agric.	Anl. Prod.	Cereals	Labor Int. Manuf.	Capital Int. Manuf.	Mach.	Chem.
Latin Amer. Dummy	0.59	0.41	-0.01	0.65	0.46	0.19	-0.30	0.11	0.15	0.37
log(distance)	-1.85**	-1.60	-2.00**	-0.89*	-2.26**	-1.47*	-1.86**	-1.77**	-1.33**	-1.20**
log(GDP)	0.07	-0.08	-0.10	-0.18	-0.21	-0.18	-0.13	-0.23*	-0.25*	-0.17
Constant	19**	18**	22**	14**	26**	19**	22**	23**	21**	17**
R-squared	0.28	0.15	0.28	0.11	0.26	0.18	0.27	0.27	0.20	0.21
* significant at 5%; ** significant at 1%										

We can use the parameters presented in Table 7 to calculate the typical distance from markets of a country that has a given GDP and a given absolute level of net exports. We call this measure the "trade implied remoteness". We then compare this number with the country's actual remoteness measure in order to evaluate if trade impediments other than remoteness are making the country actually closer or farther away than geography indicates.

The trade implied remoteness (TIR) variable is calculated as:

$$\log(TIR) = \left(\frac{1}{g}\right) * \left(\log(Abs(NetExports(i)/lab) - a - b * \log(GDP)\right)$$

where the coefficients come from estimates of the equation shown in Table 7[8].

The table above, as well as the graphs available on line, is bad news to those who expect the FTAA agreement to have a dramatic impact through increases in market access. The countries in the Americas do not trade significantly less than what is expected for countries of their sizes and location. This suggests that trade integration is unlikely to bring countries much closer and therefore is unlikely to have a dramatic effect on incomes and inequality in the region.

[8] Graphs plotting the "trade implied remoteness" measures against the countries' actual remoteness measures are available online at WWW

On the other side, Hong Kong, Korea, Malaysia, Singapore, and Japan trade significantly more than expected indicating that policy decisions placed them effectively much closer than geography dictates. Even more relevant to Latin America are the experiences of Australia and New Zealand, the two farthest away countries in the sample. Both these countries managed to overcome the burden of remoteness and trade in every product much more than expected[9].

2. FTAA may push exports towards the countries' comparative advantage

Another way the Free Trade Area of the Americas agreement can affect incomes and inequality in the region is by eliminating trade distortions and pushing countries' exports towards the goods in which they have comparative advantage. Given the region's land abundance, the lack of human capital, the strong predominance of tropical or subtropical climates, and its geographic remoteness we are lead to believe that manufacturing activities, machinery and chemicals especially, are not likely to be promoted by the adoption of the agreement. Instead tropical agriculture, natural resources abundant activities, and possibly some labor intensive manufacturing should be the expanding sectors after the creation of the FTAA.

Because it is machinery and chemicals that are generally associated with higher incomes and equality, and tropical agriculture is the one associated with lower incomes and inequality the expected effects of the described exports compositional changes are not very promising. Nevertheless quantifying these effects is an extremely hard task.

As we did in the last section we start by asking if there is scope for the FTAA agreement to affect export patterns in the region. If the exports composition of the countries in the region is significantly different from the expected composition for countries with similar climates, resources, and location, lifting trade distortions may indeed have a large effect. If, however, export patterns conform to what is expected the scope of the liberalizing measures should be limited.

Table 13 shows how the countries' exogenous characteristics affect the net exports shares in machinery, chemicals, and tropical agriculture, the three sectors empirically associated with income and inequality measures. The reason to look at net exports shares instead of exports shares is that trade distortions may not promote exports but instead lead to import substitution, what would be captured by the former but not by the later variable. Once again the equations presented are weighted regressions with the variance of the residual assumed to be equal to the labor force, thus producing regression estimates analogous to a mean with weights equal to the labor force. There is no constant in the equation because the climate shares add to one. Furthermore, for computing the t-statistics, the mean has been subtracted from the dependent variable, and the t-values on the climate proportions test if that climate zone is unusual compared with all the others, not a test if the effect is zero. The resource variables are standardized to have mean zero and variance one, thus allowing the coefficients on the climate variables to refer to the effect of climate on a country with average endowments and to allow the coefficients on the resource variables to measure the effect of a one-standard error increase. Finally a dummy variable for Latin American countries is introduced to pick up disproportionate net export shares in those countries.

The results show that the trade patterns of the Latin American countries in chemicals, machinery, and tropical agriculture are not significantly distorted relatively to what would be predicted for countries with the climates, locations, and resources in question. That leads us to conclude that the adoption of the FTAA agreement should not have a major impact on the regions' export patterns and therefore should not affect, at least through this channel, the countries' income and its distribution.

[9] See the graphs available online at WWW where those countries are singled out.

Table 13: Exogenous determinants of export shares (1987). Dependent variable: net exports as a share of total trade (deviations from mean).

Climate shares	Chemicals	Machinery	Tropical Agriculture
Latin America Dummy	-128	-322	101*
Tropical humid	43	-39	163
Tropical monsoon	159	601	-33
Tropical dry winter	14	379	33
Arid steppe	183	-61	-26
Arid desert	-43	-4	-49
Temperate mediteranean	-386**	-542	69
Temperate sub-Tropical dry winter	224	973	-54
Snow dry winter	-1551*	-996	-33
Ice tundra	703	-11861**	-402
Highland	160	1228	61
Temperate humid	225**	477	-125*
Snow humid	-469*	2259**	-199
Resources: Stand. Dev. From Mean			
Energy	0	-108	-12
Cropland	-5	-24	-2
Forestland	21	50	5
Remoteness	-129**	-251	-14
R-squared	0.53	0.43	0.4
* significant at 5%; ** significant at 1%			

V. Conclusion

In the never-ending search for villains and heroes, there is a natural tendency to attribute to governments great power over income levels and the degree of inequality. If not them, then who? And if not the FTAA, then what can lift Latin America from its unfortunate position in the economic hierarchy of nations?

Our answer is maybe no one. If there is a significant effect of an FTAA on incomes and inequality, it will surely take a very long time to show up.

We look in the data and find that climate, natural resources and location, can together explain a great deal of the variability of trade, incomes and inequality across countries. Latin America is far away, rich in natural resources and has a tropical climate, all of which contribute to low average incomes and great inequality. Further, after controlling for climate, natural resources and location, Latin America is not unusual in its trade dependence, export composition, GDP per capita or income inequality. This leaves little obvious scope for an FTAA to materially change the outcomes.

One of the clouds overhanging any plan to improve the economic health of the region is the unfortunate fact that the world is awash in countries competing to do mundane manufacturing tasks, and that route

toward progress is foreclosed by overcrowding. If there is a ray of hope, it comes from the examples of Canada, Sweden and Finland, which are countries that are rich in natural resources but nonetheless have managed to attract high-wage complex manufacturing tasks. The successes of these countries surely depend partly on education and closeness. From this is an essential lesson. The long-term economic health of Latin America cannot be established without much improvement in education and without great reductions of the economic, legal and cultural distance of the region from the high-income markets in North America and Europe.

VI. References

- Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. *The Colonial Origins of Comparative Development: An Empirical Investigation*, American Economic Review, 91(5): 1369-1401.
- Acemoglu, Daron, Simon Johnson, and James A. Robinson. *The Rise of Europe: Atlantic Trade, Instituional Change and Economic Growth*, NBER working paper # 9378.
- Blum, Bernardo. S. 2001. *Trade in Factor Services and Geography: An Account of Global Trade and its Mysteries*. UCLA mimeo.
- Deininger, Klaus and Lyn Squire. 1996. *A New Data Set Measuring Income Inequality, T*he World Bank Economic Review vol. 10(3): 565-91.
- Easterly, Willian, and Ross Levine. 2002. *Tropics, Germs, and Crops: How Endowments Influence Economic Development*, NBER working paper # 9106.
- Engerman, Stanley L., and Kenneth L. Sokoloff, 1994. *Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View from Economic Historians of the United States*, NBER working paper # H0066.
- Feenstra, Robert C., R. E. Lipsey, and H. P. Bowen. 1997. *World Trade Flows, 1970-1992, with production and tariff data*, NBER working paper # 5910.
- Fujita, M., Paul Krugman, and Anthony Venables. 1999. *The Spatial Economy: Cities, Regions, and International Trade*, MIT Press, Cambridge MA.
- Hall, Robert, and Chad I Jones. 1999. *Why do Some Countries Produce So Much more Output per Worker than Others?*, Quarterly Journal of Economics 114(1): 83-116.
- Hillberry, R. and David Hummels. *Explaining Home Bias in Consumption: the Role of Intermediate Input Trade*, NBER working paper # 9020.
- Leamer, Edward E. 1984. *Sources of international comparative advantage: theory and evidence*, The MIT Press.
- Leamer, Edward. E. 1987. *Paths of Development in the Three-Factor, n-Good General Equilibrium Model*, Journal of Political Economy, Vol. 95 (5): 961-999.
- Leamer, Edward E. 1999. *Effort, Wages and the International Division of Labor*, Journal of Political Economy, Vol. 107(6): 1127-1163. Reprinted in Singer, Hans et.al. New World Order Series, Vol. 20, 2001.
- Leamer, Edward E. and Christopher Thornberg. 2000. *Effort and Wages: A New Look at the Inter-Industry Wage Differentials*. In *The Impact of International Trade on Wages*, edited by Robert Feenstra. NBER: The University of Chicago Press, 2000: 37-84.
- Leamer, Edward E. 1997. *Access to Western Markets and Eastern Effort*. In *Lessons from the Economic Transition, Central and Eastern Europe in the 1990s*, edited Salvatore Zecchini. Dordrecht: Kluwer Academic Publishers: pp. 503-526.
- Leamer, Edward E., Hugo Maul, Sergio Rodriquez and Peter Schott. 1999. *Does natural resource abundance increase Latin American income inequality?*, Journal of Development Economics, Vol. 59(1): pp. 3-42.
- Leamer, Edward E. and Michael Storper. 2001. *The Economic Geography of the Internet Age*, Journal of International Business Studies, 32(4): 641-655.
- Machiavelli, N. 1519. *Discourses on Livy*, (Oxford University Press, New York, 1987).
- Overman, Henry G., Stephen Redding and Anthony J. Venables. 2001. *The Economic Geography of Trade, Production, Nad Income: A Survey of Empirics*, mimeo.
- Redding, Stephen, and Peter K. Schott. 2002. *Distance, Skill Deepening and Development: Will Peripheral Countries Ever Get Rich?*, mimeo.
- Rodrik, D., A. Subramanian and F. Trebbi. 2002. *Institutions rule: the primacy of institutions over geography and integration in economic development*, NBER working paper # 9305.
- Sachs, Jeffrey D. and John W. McArthur. 2001. *Institutions and Geography: Comment on Acemoglu, Johnson, and Robinson (2000)*, NBER working paper # 8814.
- Sachs, J. D. 2001. *Tropical underdevelopment*, NBER working paper # 8119.

- Strauss-Kahn, Vanessa. 2001. *Globalization, Agglomeration, and Wage Premia*, mimeo.
- Venables, Anthony. and Nuno Limao. 2002. *Geographical Disadvantage: A Heckscher-Ohlin-Von Thunen Model of International Specialization*, Journal of International Economics, 58(2).