



# IMF RESEARCH

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# TRADE TRAJECTORIES

Tariffs in a Globalized World: A Gamble Where Everybody Loses

Getting the Most out of Trade Liberalization: Evidence from Machine Learning and Threshold Models

How to Nurture the Next Generation of Exporters: The Role of Trade Intermediaries

Reading the Sea Leaves: What Do Ship Movements Tell Us about International Trade?

Interview with Antonio Spilimbergo, the Research Department's New Deputy Director



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## NOTE FROM THE GUEST EDITOR



It has been two years since the trade tensions erupted and not only captured policymakers' but also the research community's attention. Research has quickly zoomed in on understanding trade war rhetoric, tariff implementation, and economic impacts. The first article in the December 2019 issue sheds light on the consequences of the recent trade barriers.

Yet developments in other parts of the world have charted very different trade trajectories, revealing various bright spots in the midst of trade war paralysis elsewhere. IMF researchers have tracked these paths and posed highly interesting research questions. They have led to Africa, where machine learning and threshold models are employed to understand the existing barriers to fully reaping the benefits offered by a newly created free trade area; to Asia, where data on Vietnamese companies reveal insights on building networks for local producers to export globally—providing lessons on export intermediaries that can be applied worldwide; and finally to cargo vessels that travel across the world and turn into big data suppliers for constructing a global trade index.

This journey into trade research will not be the last, as researchers continue to follow the various trajectories.

~CHRISTINA KOLERUS

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# TARIFFS IN A GLOBALIZED WORLD: A GAMBLE WHERE EVERYBODY LOSES



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*Economists are renowned for disagreeing about many things—so much so that economics is jokingly said to be the only field in which two people can get a Nobel Prize for saying the exact opposite thing. But if there is one question economists of almost all stripes would answer in a similar way, it is whether trade barriers are a good idea.*

Adam Smith argued that countries should export the goods they produce with a relative advantage, hence at a lower cost, to achieve mutual benefits through free trade. David Ricardo further developed Smith's vision. He pointed out that the basis of trade between two countries is the comparative advantage in productivity. As long as productivity in two countries is different, mutual trade will make them better-off. And barriers limiting such trade hurt both parties.

Policymakers may instead treat international trade as a zero-sum game. If so, they may be tempted to embrace protectionist policies and impose tariffs to support certain domestic industries or extract gains from beggar-thy-neighbor policies. Yet, particularly in a world as globalized as ours, tariffs jeopardize global production chains, generate unintended fluctuations in exchange rates, and can lead to retaliation by other countries. Both the short- and long-term impact of tariffs can therefore, be detrimental.

For example, when a country imposes tariffs on electronic goods imports, domestic laptop prices increase. On one hand, imported laptops cost more because of the higher tariffs. On the other hand, domestically assembled laptops are more expensive because of tariffs imposed on the electronic components (such as chips, screens,

and keyboards). No matter which one you choose, your wallet will be hurt. What's worse is that the increase in the cost of production could reduce not only domestic sales but also the volume of sales in international markets.

## **THAT'S THE THEORY. SO WHAT IS THE IMPACT OF THE CURRENT INCREASES IN TARIFFS?**

Recent [IMF research](#) compares results from three state-of-the-art models to evaluate the macroeconomic effects of tariffs on China, the United States, and third countries. The models simulate a hypothetical and illustrative scenario in which tariffs on all US-China trade increase by 25 percentage points. Results show that both the United States and China suffer the largest losses. This result is broadly robust across models, all of which feature a general equilibrium framework but different ingredients in terms of rigidities and sectoral production details. For example, US-China trade volume decreases 25 to 30 percent in the short term (according to the IMF's Global Integrated Monetary and Fiscal [GIMF] model) and 30 to 70 percent over the long term (based on GIMF and two trade-focused models).

In the GIMF model—a dynamic stochastic general equilibrium model—high rigidity in terms of the capacity to adjust import volumes slows quantity and price adjustments and leads to a strong short-term negative impact. Invoicing imports in the currency of destination

markets could also mean rigidity and amplify negative shocks. The two trade models, which emphasize sectoral production, tend to deliver more negative results in the long run as factors of production are reallocated inefficiently and trade volume is disrupted by higher tariffs. This effect is particularly pronounced in the model that features increasing returns to scale as a result of firms' entry and exit costs. Independent of the particular ingredients of different frameworks, however, higher tariffs would hurt global growth in the short and medium term.

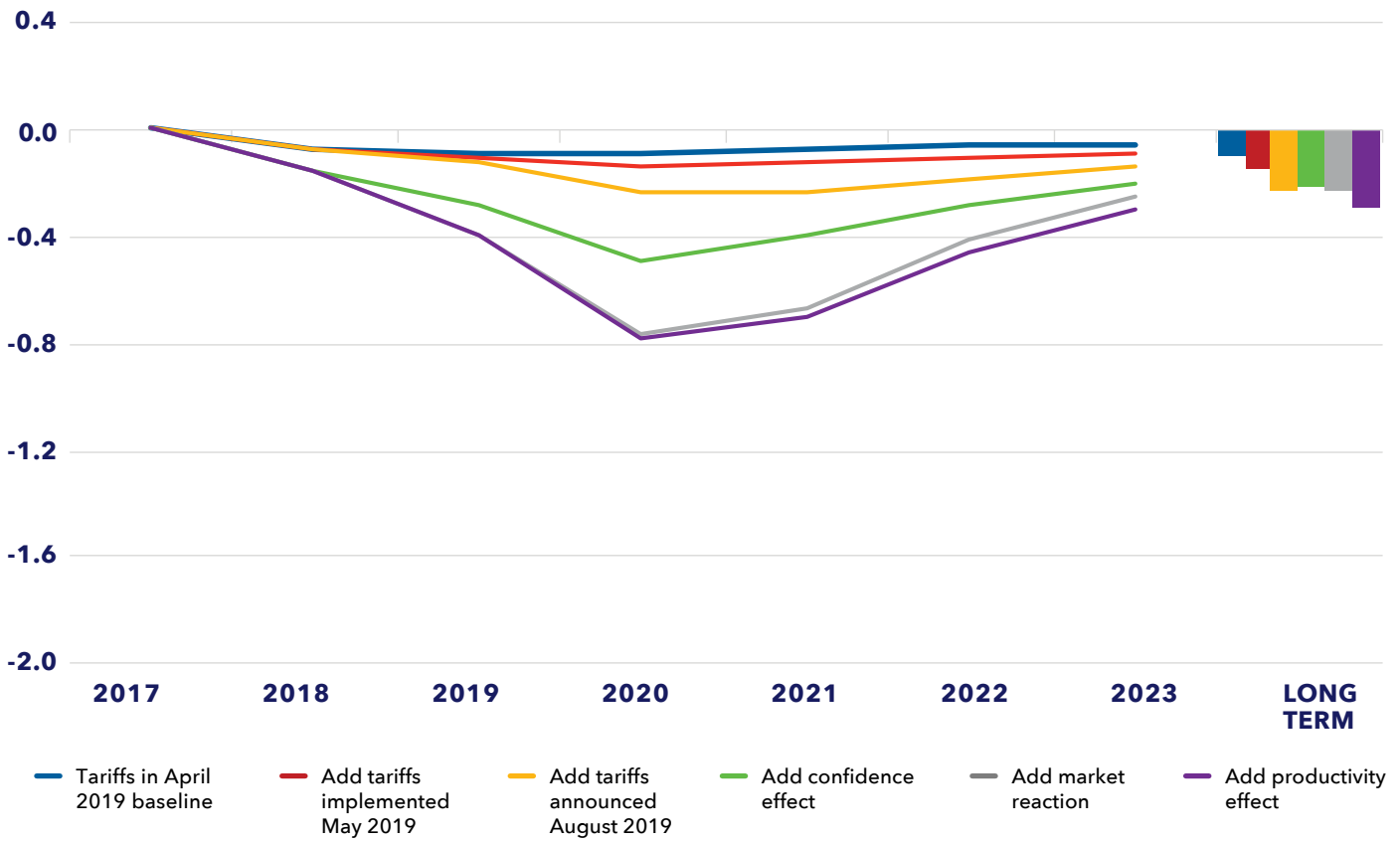
Simulations using a refined version of the IMF's GIMF model (in the [October 2019 World Economic Outlook](#)) also stress trade tensions' harm to global growth. The tariffs imposed between China and the United States in 2018 and 2019 may reduce—through confidence effects, market reaction, and productivity effects—both countries' GDP by up to 2 and 0.6 percent, respectively, and global GDP by up to 0.8 percent in 2020 (see figure).

Recent [empirical work at the IMF](#) complements the models and provides evidence that US-China trade tensions have negatively affected consumers as well as many producers in both countries. The tariffs have reduced trade between the United States and China, but the bilateral trade deficit remains broadly unchanged. While the impact on global growth is relatively modest at this time, the latest escalation could make a significant dent in business and financial market sentiment, disrupt global supply chains, and jeopardize the projected recovery in global growth in 2019.

Economists are not always right and, indeed, have gotten it wrong in the past. The evidence so far, however, suggests that the one thing many economists agree on may actually be happening.

### World Real GDP

(Percent deviation from control)



Source: IMF staff estimates.



# GETTING THE MOST OUT OF TRADE LIBERALIZATION

Evidence from Machine Learning and Threshold Models



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*Trade wars have grabbed headlines in much of Asia, Europe, and North America, but some bright spots in favor of free trade have emerged in Africa.*

On May 30, 2019, the African Continental Free Trade Area (AfCFTA) officially went into effect. With 52 African nation members, the AfCFTA covers more than 1.2 billion people and is the largest free trade area in the world since the creation of the World Trade Organization in 1995. It will, as part of its first phase, focus on liberalization and eliminate 90 percent of existing intraregional trade restrictions on goods. Negotiations on a second phase focused on intellectual property rights and competition policy are expected to conclude in 2020.

## WHAT DOES IT TAKE TO MAKE THE MOST OF SUCH REGIONAL TRADE LIBERALIZATION?

The experience of the existing subregional economic communities suggests that reducing tariffs alone is not sufficient to boost intraregional trade (IMF 2019).<sup>1</sup> Moreover, further regional trade development has been constrained by factors other than tariffs—namely, infrastructure, trade logistics, business climate, education, and financial depth (IMF 2019). Improving these nontariff factors will therefore be crucial to maximize the benefits of the AfCFTA. Quantifying the effects of these nontariff factors could help make policies more targeted and effective.

In this context, recent work (as a forthcoming background working paper for IMF 2019) by IMF economists seeks answers to two questions. The first concerns the direct effects on trade of nontariff factors: Which of these factors is most essential to explaining trade, after accounting for potentially nonlinear relationships and other relevant factors? The second question concerns indirect effects that stem from the interaction of nontariff factors with tariffs: Which of these nontariff factors most constrains the effectiveness of tariff reduction in promoting trade?

## DIRECT EFFECTS: TRADE LOGISTICS AND PHYSICAL, OR HARD, INFRASTRUCTURE MATTER THE MOST

There are two challenges to analyzing the “direct effect” question. The first is the “curse of dimensionality”: there is an overwhelmingly large number of potential indicators that measure nontariff factors. For example, there are 39 different measures of education from different data sources. The second challenge is that it is not immediately clear how these individual factors interact to affect the final variable of interest—trade.

Principal component analysis and machine learning techniques (particularly, random forest models) are well suited to these challenges: the former reduces the many possible factors into one summary factor that accounts for as much of the variability in the data as possible, and the latter let the data speak, without imposing any functional forms on the relationship between the dependent and independent variables. Applying these techniques to several data sets that contain a large number of indicators from different sources (including a panel data set that covers 121 countries) and controlling for other fundamental variables that may affect a country’s trade, such as GDP per capita, the so-called importance scores are estimated (see figure). As a useful indicator, the importance score measures the increase in the model’s prediction error after the variable’s values are randomly changed, so a variable with the highest importance score has the highest prediction power on the dependent variable.

It turns out that trade logistics have the highest importance score in terms of the direct effect on trade. The measurement of trade logistics is based on the World Bank’s Logistics Performance Index data set, which uses principal component analysis to aggregate information along five dimensions: customs procedures, international shipment processing, logistics quality and competence, timeliness, and tracking and tracing. These represent the soft infrastructure and are crucial for trade facilitation.

<sup>1</sup> This publication was featured on CNN’s Sunday morning news show on September 15, 2019: <https://www.cnn.com/videos/tv/2019/09/16/exp-gps-0915-witw-african-free-trade.cnn>.



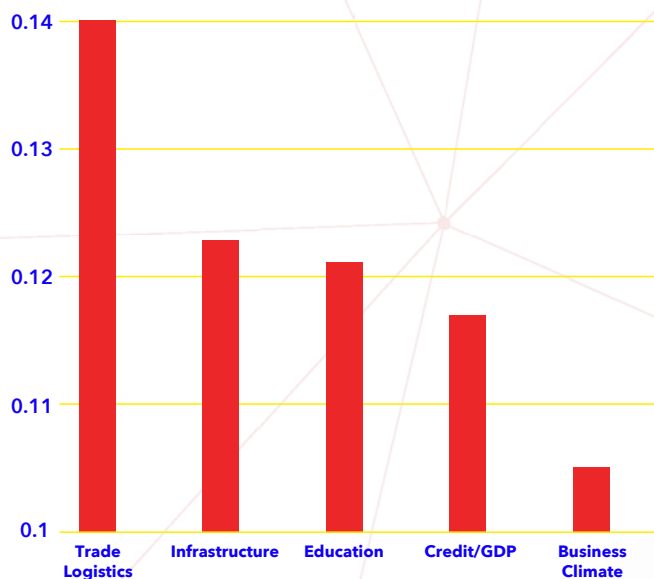
Physical, or hard, infrastructure is the second most important nontariff factor. The measurement of hard infrastructure is also an index derived from principal component analysis using eight indicators: quality of roads, railroads, ports, air transportation, airlines, electricity, mobile phones, and landlines. The quality of hard infrastructure in sub-Saharan Africa (SSA) lags that of the rest of the world, with most of these indicators in most SSA countries falling below the 25th global percentile.

### INDIRECT EFFECTS: HARD INFRASTRUCTURE IS A BOTTLENECK—MORE SO IN SOME COUNTRIES THAN IN OTHERS

The indirect effects of nontariff factors on trade (through their interaction with tariff reductions) are estimated by means of a panel threshold model. Such a model allows investigation of possible breaks in the tariff-trade relationship while accounting for country-specific effects (that is, controlling for fixed effects) using standard econometric techniques. What are the main results?

Tariff reductions overall have a much larger effect on trade when a country's hard infrastructure is above a certain threshold. Specifically, once the quality of hard infrastructure reaches a certain threshold (that is, after the bottleneck is eliminated), the trade-stimulating effect of a tariff reduction will be *more than doubled*.

#### Optimized Random Forest Importance Score Ranking



Source: IMF staff.

Moreover, both the presence of the threshold effect and the threshold level itself depend on the country's geographic characteristics and/or economic structure.

- For *landlocked* economies: Both hard infrastructure and trade logistics display threshold effects because trade flows of such economies rely more heavily, for example, on the quality of roads and railway networks.
- For *low-income* countries: Besides physical infrastructure, education also displays a threshold effect and constitutes a severe bottleneck for tariff reduction. This may be because a better trained labor force supports the emergence of a more diversified economy as trade and growth take root.

### CONCLUSIONS AND POLICY IMPLICATIONS

The analyses of both the direct and indirect effects point to the same nontariff factor that matters most for trade: hard infrastructure. Consequently, to reap the most benefit from tariff reductions in the AfCFTA, infrastructure bottlenecks must be addressed. Other bottlenecks differ for countries, depending on their geographic characteristics and economic structures. Hence, given the limited fiscal space in most SSA countries, policymakers could prioritize the development of hard infrastructure according to country-specific features.

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# HOW TO NURTURE THE NEXT GENERATION OF EXPORTERS?

The role of trade intermediaries



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*Suppose you are a rice farmer in Vietnam with a successful harvest over the past few years. Wouldn't it be nice to increase your sales and expand your customer base by tapping the international market? But reaching customers directly in a range of countries takes a lot of work and money. What if there were another way: selling your product to a global retailer with name recognition and networks all over the world?*

Trade intermediaries such as wholesalers and retailers play a significant role in the export sector, in particular for small and medium-sized companies. For example, nearly 20 percent of Chinese and French exports and about 10 percent of Italian, US, and Vietnamese exports are carried out by intermediaries. Firms that export via intermediaries, so-called indirect exporters, tend to be smaller and less productive than direct exporters. While much has been [documented](#) about the static characteristics of these firms, little is known about their business dynamics and prospects over time. Once firms start exporting indirectly, do they grow over time? Do they eventually become direct exporters (exporting without trade intermediaries)? What share of the gains from trade is generated by indirect exporters?

A forthcoming IMF working paper seeks to address these questions empirically and theoretically. The paper uses firm-level data from Vietnam to document business dynamics of indirect exporters and develops a dynamic trade model to decompose the welfare gains from indirect and direct exporting. After a series of economic reforms over the past three decades, Vietnam is now one of the fastest growing economies in the world. Export growth has been the key driving force behind this rapid economic expansion, which makes Vietnam a suitable case for the study of export dynamics and the evolution of exporters.

## WHAT DO FIRM-LEVEL DATA FROM VIETNAM TELL US?

First, indirect exporting is a temporary state: the probability of remaining an indirect exporter for two consecutive years is lower than the probability of remaining a direct exporter. Second, indirect exporters graduate faster: they are more likely than nonexporters to shift to direct exporting in subsequent years. Finally, indirect exporting helps build sales networks abroad: among new direct exporters, the group with indirect experience has a higher average export-to-sales ratio than the group without such experience.

## WHAT ARE THE MECHANISMS BEHIND THESE OBSERVATIONS?

These facts are replicated in a small open economy framework in which Vietnam is the home country and the rest of the world is the foreign country. The model builds on [earlier research](#) and extends those models to a dynamic setting. There are three types of firms: nonexporters (firms operating domestically), indirect exporters, and direct exporters. These types reflect differences in productivity, foreign demand, and fixed and variable costs. A key feature of this model is customer accumulation. Upon entry, new exporters have access to a small share of aggregate demand in the foreign country. As firms continue to export—indirectly or directly—this share expands. On average, indirect exporters have access to a higher share of foreign demand than nonexporters, as a result of their exporting tenure. This explains why indirect exporters are more likely than nonexporters to export directly in the future and why, among new direct exporters, the group with indirect exporting experience has a higher average export-to-sales ratio.

The model calibrated to match the Vietnamese data demonstrates that the fixed costs of indirect exporting are only 30 percent of the fixed costs of direct exporting. Intermediaries allow for lower fixed costs and thus easier entry, but—since fixed costs are used to build export networks—indirect exporters expand more slowly than direct exporters. It takes 10 years for indirect exporters and 5 years for direct exporters to reach their average export-to-sales ratio. The calibrated model can also evaluate the importance of intermediaries. In the absence of intermediaries, and hence of indirect exporting, the share of exporters declines by 10.5 percentage points, export volume contracts by 11.1 percent, and welfare drops by 1.3 percent. Indirect exporting accounts for 18 percent of the gains from trade in Vietnam.

## HOW CAN POLICIES AFFECT EXPORT PERFORMANCE?

The model can be used to run counterfactual exercises to seek insight into this question. Consider, for instance, trade license requirements. In Vietnam, until 20 years ago, if firms wanted to export or import, they had to use a handful of state-owned enterprises as trade intermediaries. The impact of reinstating this trade license requirement can be evaluated by closing the direct exporting channel. For highly productive firms or for firms that face high foreign demand, exporting indirectly is not the optimal decision.

This is mainly because these firms find it more desirable to pay the high fixed costs of direct exporting and enjoy its lower variable costs by exporting larger quantities. Consequently, in the absence of the direct exporting channel, the share of exporters declines by 11 percentage points, export volume drops by 74 percent, and welfare falls by 6 percent.

As another example of a counterfactual exercise, consider moderate subsidies to reduce the fixed cost of indirect exporting. [Recent research](#) shows that wholesalers, on average, export more products than manufacturing firms, which suggests that these trade intermediaries spread the

fixed costs of indirect exporting across many products. Under this assumption, taxing the income of households and subsidizing the fixed costs of indirect exporters can lead to welfare gains, although these gains are negligible.

For a small Vietnamese rice producer, exporting directly may be expensive and risky. However, another way of gaining access to international markets is through trade intermediaries. Indirect exporting is not only a cheaper way of testing the waters in foreign markets, it is also a stepping-stone to direct exporting for small and young exporters.



20<sup>th</sup> Jacques Polak  
**Annual  
Research  
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The Good. The Bad. The Ugly



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## THE ANNUAL RESEARCH CONFERENCE 2019:

Celebrating 20 Years of Academic Excellence

The Jacques Polak Annual Research Conference celebrated its 20th anniversary November 7–8. This year’s conference focused on **“Debt: The Good. The Bad. The Ugly”** covering household, corporate, and public debt.

Debt measurement and sustainability were a common thread across both academic and policy sessions. Researchers and policymakers alike argued that standard accounting identities or the simple debt-to-GDP ratio were insufficient to assess indebtedness or evaluate debt sustainability. While interest and growth rates had been often negative in the past—suggesting smaller costs of debt—the lively discussions, including the session with Olivier Blanchard and Kenneth Rogoff, revealed disagreements on the implications of this empirical regularity for policymaking, particularly at the current juncture.

In his Mundell-Fleming Lecture, Jeremy Stein took up the question of what policy could do to dampen credit cycles. He argued that sentiment plays an important role in driving credit booms and busts. While central banks already pay attention to sentiment, it remains unclear how strongly it should affect setting policy rates. Stein further emphasized that macroprudential policies could be insufficient to address financial stability concerns, especially when the unregulated financial system is large.

Interested in learning more about the Annual Research Conference? Visit the conference [website](#) for links to videos of Managing Director Kristalina Georgieva’s opening remarks, Stein’s Mundell-Fleming Lecture, and the discussion featuring Blanchard and Rogoff, as well as links to all academic papers presented at the conference.



# READING THE

# SEA LEAVES

WHAT DO SHIP MOVEMENTS TELL US ABOUT INTERNATIONAL TRADE?

A BIG DATA STORY



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**Maritime trade has formed the backbone of economic prosperity from ancient times to the globalized 21st century. Until recently, it was almost impossible to accurately track the plethora of shipping routes—big data and new technologies allow us to do so now and to derive real-time information on the state of the global economy.**

In 2018, about 80 percent of global trade by volume (more than 70 percent by value) was shipped by sea, according to the United Nations Conference on Trade and Development. Modern technology allows us to monitor the global movements of these ships using the automatic identification system (AIS)—a maritime safety communication system for international vessels. All major commercial ships (over 300 gross tons) are required to install a device that emits a radio signal, indicating the ship’s identification number, position, speed, and other safety-related

information about the ship’s course. These devices transmit a signal every few seconds, generating a continuous flow of information about shipping traffic.

What if this massive amount of real-time data on vessel traffic could be used to track the movement of goods across the globe? What are the benefits and challenges of using big data to produce real-time information about trade? In what ways can countries use this source to complement traditional sources of trade statistics?

To answer these questions, a team of IMF economists employed a more structured version of the AIS data, containing “port-calls data.” Port-calls data combine ship positions and port boundaries to track the arrival and departure of ships in a port. The economists used Malta—an island state in the European Union, with a population of about half a million people—as a case study. Malta is very

open to international trade, relying heavily on imports of industrial and consumer goods, most of which arrive by sea. The sample data for Malta for the purposes of this research came from [MarineTraffic](#), one of the largest providers of AIS data in the world.

## The IMF study proposes a two-tiered approach to a new trade index:

### DETERMINING PORT VISITS:

First, only port calls of ships involved in international trade are identified. The number of filtered ships tracks the movement in the official figures for port visits in Malta’s maritime statistics relatively well (Figure 1) but is, interestingly, consistently higher than port statistics. On the one hand, the

**Figure 1. Malta: Port Visits**



Sources: Eurostat; MarineTraffics; and authors’ calculations.

Note: AIS = automatic identification system.



**Figure 2. Malta: Trade Volumes**



Sources: Eurostat; MarineTraffic; and authors' calculations.

Note: AIS = automatic identification system.

higher level of AIS data may indicate that these data record multiple visits of the same ship or ships that may only be passing through the port. On the other hand, it is also a sign of exhaustive coverage of maritime traffic recorded in official statistics.

### FROM SHIP LOADS TO TRADE VOLUMES:

Next, the study proposes a methodology to estimate the volume of goods exchanged in the port, based on AIS information on the maximum carrying capacity of the vessel (its "deadweight tonnage") and changes in its cargo load (proxied by its "draught") before and after its port visit. The strong correlation with official trade data is striking (Figure 2).

These results suggest that it may be possible to track international trade in real time using AIS data on vessel traffic. This new trade index would not supplant but supplement traditional

statistics on trade by providing fast readings and greater detail on international trade movements.

It may be of particular value for countries with relatively weak statistical capacity to capture trade flows in a timely way. The index would therefore help identify the turning points of the economy much faster and generate early warning signals of a trade slowdown.

These findings have important implications for policymaking. International trade represents a significant share of GDP in many countries, particularly in small states with open economies. Tracking a country's trade in real time may offer quick and valuable insight into the health of an economy. The methodology applied for Malta can easily be extended to other countries, particularly those with a sizable share of trade carried by ships. Going in this direction, the IMF team covering Kiribati—a small and fragile

state with one of the largest ocean territories in the world—plans to use the methodology in the forthcoming checkup of the country's economy. At the global level, AIS data offer great potential for observing world trade flows on a real-time basis, thereby greatly improving the monitoring of global trade patterns.

Technology is offering several new big data sources, such as high-frequency vessel traffic data. We live in an era of a continuously evolving and expanding ecosystem of data and statistics. And data are much more accessible than in the past. The challenge is for policymakers and private entities to learn how to transform big data into high-quality statistics and use them to make better decisions.



# Interview with **ANTONIO SPIILIMBERGO**

## The Research Department's New Deputy Director

*A passionate researcher—and linguist—Antonio tells us in this interview with Christina Kolerus how he manages to balance academic rigor and challenging field experience. He has published in leading academic journals, including the American Economic Review and the Review of Economic Studies, on topics ranging from macroeconomics and development economics to international trade and political economy.*

*After nine exciting years as mission chief of Slovenia, Italy, Russia, Turkey and Brazil, Antonio is returning to the Research Department.*

**CHRISTINA:** Antonio, you have had a very interesting career at the Fund with incredibly broad research and publications, from the economics of education to populism and, of course, trade. Before hearing more on this, let me ask you, have you always wanted to be an economist?

**ANTONIO:** Actually, since high school, I have been very interested in linguistics. In my free time I often read books on linguistics, most recently on the theory of syntax—an abstruse but fascinating subject. A few linguists in academia are kind enough to help me when I have a doubt. They call me “a linguist in disguise.”





**C:** So why did you choose economics after all?

**A:** Because I thought that if I want to earn a living, I might need to do something else than linguistics. I was also interested in how the world works. Linguistics is a very specific field, while economics is all-encompassing. Finally, I like math, and economics sounded like a good way to put together my interests with my abilities.

**C:** Can you tell us about some of your work around trade?

**A:** My work on trade focused on three topics: first, welfare and growth effects of trading blocs; second, trade implications of the East Asian crisis in the end-90s; and third, the effects of trade on income distribution.

The [papers](#) on the first topic were theoretical. In the early 1990s, trade was a very dynamic policy area with the signing of NAFTA, Mercosur, and other trading blocs. The question which intrigued me was how these trading blocs could enhance growth. Was there more learning by doing (and productivity growth) in the country specialized in the most advanced products within a trading bloc? I was unhappy with the responses given by the theoretical models at the time. They seemed to me too dependent on a few “simplifying assumptions.” For policy work it is key to know which theoretical results are robust and which ones depend on ad hoc assumptions.

On the second topic, my [contribution](#) was empirical. I asked if real effective exchange rates adequately reflect competitiveness when there is a crisis with major movements in nominal exchange rates. On the [third topic](#) I tried to bridge the gap between the factor income distribution, which is affected by trade, and the personal income distribution, which is the distribution we care about.

**C:** Later on, you became mission chief of very interesting countries, often during difficult times. How has your research influenced your work as mission chief?

**A:** An economist without country experience is like an engineer who has never seen a bridge or a doctor who never sees a patient. At the Fund we have this big advantage to gather firsthand experience and later to elaborate on this. In academia you might talk about a bridge but you never see one in practice...

**C:** ...or test whether the bridge actually holds...

**A:** Exactly. As a mission chief, I dealt with several countries at a critical juncture, like the banking crisis in Slovenia, the euro and debt crisis in Italy, a failed coup d'état in Turkey, and historic elections in Brazil. All these different challenges required different approaches and ideas. A research background gives you a broad toolkit that you can offer to the country authorities. Crises are opportunities to learn and to be helpful only if you are willing to discuss new ideas.

**C:** Can you give us a few examples? For instance, did you have concepts or insights from your research in mind when providing policy recommendations?

**A:** The most interesting example is Russia during the 2014 crisis. The country faced three different shocks: uncertainty due to geopolitical tensions related to Crimea; the fall in the price of oil; and the sanctions imposed by the international community. It helped to separate these three effects in an analytical framework. Once you have separated them, you are able to study each one in depth, put your analyses together and see what happens in reality.

Let me add that another advantage of having a research background is that I could attract superb economists in all teams; they were dynamic, hard-working, and motivated by intellectual curiosity. This made the “crisis work” always very interesting and (hopefully) useful for the Fund and the authorities.

**C:** Let me ask a tricky question, and no worries you can brag a bit. Have you ever successfully convinced your counterpart with results from your research?

**A:** I cannot brag of anything in particular, but I am very proud that I maintained excellent relationships with the authorities of all countries on which I worked. I do exchange ideas regularly with them even after my official country work ended. It is very rewarding that the authorities seek your opinion outside the usual channels and I like to brag about it.

**C:** Let's turn this around. How has being a mission chief influenced your research?

**A:** I can say that almost all my papers started from a policy question.

For instance, the work with Prachi Mishra on the pass-through from exchange rates to domestic wages and the degree of integration between domestic and foreign labor markets started as an internal (quick and dirty) note on Latvia. We found that in the presence of labor

market integration, the traditional hypothesis of wage stickiness was not warranted. With some extra work, the [paper](#) was published in the *American Economic Journal: Macroeconomics*.

The work on foreign education is another example. I noticed a big difference in policymaking in many countries where the leadership had studied abroad. So, out of curiosity, I collected data on foreign tertiary education. I found that it made a big difference to the country's future to which foreign country students went. Countries whose students left for democracies to study became more democratic after about 20 years—when these students with new ideas were in power. I wrote a [short piece](#) on this which was accepted in the *American Economic Review*.

**C:** Which field of economics is next on the agenda? Looks like you've covered them all.

**A:** I am interested in political economy, monetary policy, and the effects of uncertainty on the economy.

I feel that we, as economists, do not have all the instruments to understand the new wave of populism. This is the reason why I reached out to a couple of political scientists. Economists often tend to have the naive view that populism is simply a protest movement against an unequal income distribution. The simple logic is that trade and technology create "losers" who are not adequately compensated. However simple this logic, I feel that this is not the complete story. Political scientists look at a variety of other causes,

including cultural backlash and the so-called crisis of representation, which suggest that populists give voice to instances previously ignored. If you consider populism as a crisis of representation as opposed to a movement for a different income distribution, new implications and challenges arise. For instance, how could we fit together the demand for more democratic accountability (responsiveness of institutions) and transparency with the tendency of having rules-based independent institutions or agencies (responsibility of institutions). Responsibility versus Responsiveness.

**C:** In our last issue, Gita told us that she was a research assistant for Maury Obstfeld and Ken Rogoff. You seem to have followed a similar career being a research assistant for Stanley Fischer and Olivier Blanchard. Who were your most influential teachers?

**A:** I had the pleasure of working for and especially learning from both. I worked much more with Olivier Blanchard and that had the most influence on me. I like his intuitive way of approaching (and solving) problems. He has the gift of making complex problems simple. French Cartesian clarity at its best.

**C:** After many years here in DC, what is it you're still missing from your native Italy?

**A:** I kept very good friends in Italy and we go there with my family every year. With all social media in a globalized world it's difficult to miss somebody or something.







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