

AUSTRALIAN RESEARCH COUNCIL
Discovery Projects
Application for Funding Commencing in 2024

DP

Project ID: DP240101563

First Investigator: A/Prof David Ubilava

Admin Org: The University of Sydney

Total number of sheets contained in this Application: 77
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Part A - Administrative Summary (DP240101563)

A1. Application Title

(Provide a short title (up to 75 characters, approximately 10 words).)

Political Conflict, Inefficient Markets, and Food Crises

A2. Person Participant Summary

(Add all people participating in this application as a Chief Investigator or Partner Investigator. The Chief Investigator/s must: not be undertaking a Higher Degree by Research during the Project Activity Period; reside for more than 50 per cent of their time in Australia for the Project Activity Period; and be an employee for at least 0.2 FTE at an Eligible Organisation, or be a holder of an honorary academic appointment (defined in the Glossary of the grant guidelines) at an Eligible Organisation.)

Number	Name	Participant Type	Current Organisation(s)	Relevant Organisation
1	A/Prof David Ubilava	Chief Investigator	The University of Sydney	The University of Sydney
2	Prof Justin Hastings	Chief Investigator	The University of Sydney	The University of Sydney
3	A/Prof Andrey Vasnev	Chief Investigator	The University of Sydney	The University of Sydney
4	Dr Ashani Amarasinghe	Chief Investigator	The University of Sydney	The University of Sydney

A3. Organisation Participant Summary

(Add all organisations participating in this application. Refer to the Instructions to Applicants for further information.)

Number	Name	Participant Type
1	The University of Sydney	Administering Organisation

A4. Application Summary

(Provide an Application Summary, focusing on the aims, significance, expected outcomes and benefits of this project. Write the Application Summary simply, clearly and in plain English. If the application is successful, the Application Summary will be used to give the general community an understanding of the research. Avoid the use of acronyms, quotation marks and upper-case characters. Refer to the Instructions to Applicants for further information (up to 750 characters, approximately 100 words).)

This project aims to investigate the effect of political conflict on food markets in low- and middle-income countries across Africa and Southeast Asia by utilizing granular data on ethno-political conflict, prices, and institutions. This project expects to generate new knowledge in the area of conflict studies using an innovative approach that allows eliciting disruptive effects of conflict by examining price relationships in spatially and temporally connected food and agricultural markets. Expected outcomes of this project include improved techniques to examine market inefficiencies in the wake of political conflict. This should provide significant benefits, such as creating an early warning platform for food crises in times of conflict.

A5. National Interest Test Statement

(See the Instructions to Applicants for addressing the National Interest Test and further information available on the ARC website.)

Foreign policy heavily relies on a good understanding of internal socio-political affairs in recipient countries. Australian policymakers have struggled to gauge the political and economic situations in low- and middle-income countries with high levels of conflict and poor governance. A lack of access to accurate data has been the main reason for this. The benefits of the project will be seen in improved data-driven assessments of political and economic situations, which will allow the Australian government to better target foreign aid and strategic investments, particularly in Southeast Asia and Africa. The project will provide greater insight into potential export markets in these regions, particularly for major cereals of which Australia is one of the world's leading exporters. The project will contribute to Australia's science and research priority of "Food" and help to drive economic growth

opportunities for primary producers, particularly cereal exporters. The spatiotemporal market integration framework will measure how a country's institutions facilitate storage and trade in internal and external markets. The project will develop a forecasting tool to generate a real-time outlook on food affordability, particularly in the wake of internal and external conflicts. This tool will become an effective platform to promote research outcomes beyond academia, which includes informing policymakers of the risks of food crises and famines in historically susceptible regions.

Part B - Classifications and Other Statistical Information (DP240101563)

B1. Australian Government priority areas

(Does this application align with an announced Australian Government policy? For reporting purposes, the ARC is capturing relevant Australian Government policies for your application. If your application does not align with an announced Australian Government policy, please select 'No'.)

Yes

Full name of current Australian Government Policy and, if known, year of announcement.

Food

B2. Field of Research (FoR-2020)

(Select up to 3 FoR classification codes that relate to the application. Note that the percentages must total 100.)

Code	Percentage
440402 - Humanitarian disasters, conflict and peacebuilding	40
440404 - Political economy and social change	35
380101 - Agricultural economics	25

B3. Socio-Economic Objective (SEO-2020)

(Select up to 3 SEO classification codes that relate to the application. Note that the percentages must total 100.)

Code	Percentage
230305 - Peace and conflict	60
230299 - Government and politics not elsewhere classified	40

B4. Interdisciplinary Research

(This is a 'Yes' or 'No' question. If you select 'Yes' 2 additional questions will be enabled:

1. Specify the ways in which the research is interdisciplinary by selecting one or more of the options below and click 'Add'.
2. Indicate the nature of the interdisciplinary research involved (up to 375 characters, approximately 50 words).)

Does this application involve interdisciplinary research?

Yes

Specify the ways in which the research is interdisciplinary by selecting one or more of the options below.

Investigatory Team
Design

Indicate the nature of the interdisciplinary research involved (up to 375 characters, approximately 50 words).

The project is, by design, interdisciplinary as it combines advancements in the fields of political economy and governance, development economics, and economic forecasting. The investigatory team consists of members with background training and expertise in the aforementioned three areas.

B5. Does the proposed research involve international collaboration?

(This is a 'Yes' or 'No' question. If you select 'Yes' 2 additional questions will be enabled:

1. What is the nature of the proposed international collaboration activities?

2. If the proposed research involves international collaboration, specify the country/ies involved.)

No

B6. What is the nature of the proposed international collaboration activities?

(Select all options from the drop down list which apply to this application by clicking on the 'Add' button each time an option is selected.)

B7. If the proposed research involves international collaboration, please specify the country/ies involved.

(Commence typing in the search box and select from the drop-down list the name of the country/ies of collaborators who will be involved in the proposed project. Note that Australia is not to be listed and is not available to be selected from the drop-down list.)

B8. How many PhDs, Masters and Honours positions will be filled as a result of this project?

(For reporting purposes, the ARC is capturing the number of Research Students that would be involved if the application is funded. Enter the number of all student places (full-time equivalent - FTE) that will be filled as a result of this project, not just those requested in the budget for funding in the application form.)

Number of Research Student Places (FTE) - PhD

1

Number of Research Student Places (FTE) - Masters

0

Number of Research Student Places (FTE) - Honours

3

Part C - Project Eligibility (DP240101563)

C1. Medical Research

(This is a 'Yes' or 'No' question. Does this application have content which requires a statement to demonstrate that it complies with the eligible research requirements set out in the ARC Medical Research Policy located on the ARC website?)

No

C2. Medical Research Statement

(Justify why this application complies with the eligible research requirements set out in the ARC Medical Research Policy located on the ARC website. Eligibility will be based solely on the information contained in this application. This is the only chance to provide justification, the ARC will not seek further clarification (up to 750 characters, approximately 100 words).)

C3. Current Funding

(Does this application request funding for similar or linked research activities, infrastructure or a project previously funded, or currently being funded, with Australian Government funding (from ARC or elsewhere)? This is a 'Yes' or 'No' question. If 'Yes', provide the Project ID(s) and explain how funding this project would not duplicate Australian Government funding or overlap with existing projects.)

No

Funded Project ID(s)

Detail how this project is different from the previously/currently funded project(s) (up to 2000 characters, approximately 285 words).

C4. Other application(s) for funding

(Are you applying for funding from the Australian Government (ARC or elsewhere) for similar or linked research? This is a 'Yes' or 'No' question. If 'Yes' provide the application ID(s) and briefly explain why more than one application for similar or linked research has been submitted and, should all applications be successful, how they will be managed to avoid duplication of Australian Government funding.)

Yes

If yes, provide the application ID(s)

NI230100117

Briefly explain why more than one application for similar or linked research has been submitted and, should all applications be successful, how they will be managed to avoid duplication of Australian Government funding (up to 2000 Characters, approximately 285 words).

The two applications fall under the same general topic that links agriculture with conflict, but are fundamentally different projects in three important ways: (i) geographic scope - this application covers Africa and Southeast Asia, the other application covers only Southeast Asia (and the South Pacific); (ii) thematic focus - this application aims to investigate potential market inefficiencies, particularly as they relate to farmers inability to store or trade their produce in the wake of the conflict, the other application is concerned with examining the effect that harvest time income shocks may have on the propensity of conflict; (iii) goals and deliverables of the projects – this application

looks at causes of food insecurity, and aims (in part) to produce forecasting models for cereal prices that will be useful to aid agencies and developing country practitioners, while the other application aims to produce an early warning system for conflict useful for Australian government national security users.

Part D - Project Description (DP240101563)

D1. Please confirm that potential risks have been taken into consideration for the proposed project, including the impacts of COVID-19.

(The application form will not validate if "No" is selected. Please note that if this application is successful a risk management plan will be required to be held by the Administering Organisation before the project starts and any changes in circumstances that affect the proposed research project will be managed as a post award issue by the ARC.)

Yes

D2. Project Description

(Upload a Project Description as detailed in the Instructions to Applicants and in the required format. Ensure that the Project Description responds to the Assessment Criteria listed in the grant guidelines (up to 10 A4 pages).)

Uploaded PDF file follows on next page.

D2 Project Description

PROJECT TITLE: Political Conflict, Inefficient Markets, and Food Crises

PROJECT AIMS AND BACKGROUND

The problem

Political conflict, in some form and to some extent, defines the daily life of people in many low- and middle-income countries. The root causes of conflicts typically vary and can be linked, among other factors, to the insurgency against the local and central governments or to people's protests in response to governments' actions (or inactions). Regardless of the source, a common attribute of conflict is that it happens—by design or as a side-effect—where people are. As such, it impacts—directly or indirectly—the well-being and livelihoods of people. A suicide truck bombing in a market in Mogadishu (Somalia) on 14 October 2017, for instance, killed more than 500 people and had an immediate chilling effect on marketplace activity (Burke and Ahmed, 20 December 2017).

People living in poor, marginalised states with dysfunctional formal institutions often struggle to source and buy food and other necessities, or to move around their own countries, stymied as they are by conflict, territorial fragmentation, and failures in transport, communications, and market enforcement. Markets may remain surprisingly functional in the face of these adversities, however, particularly in places where the rule of law is scarce but informal institutions are prominent. Commenting on the resilience of Mogadishu after the truck bomb, one Somali noted, “There is a blast in Mogadishu destroying whole buildings and you see the next day people start renovating. Life goes on. Those who died have died. We have to think about those who live now. They need life.” (Burke and Ahmed, 20 December 2017).

Conflict and food insecurity are intrinsically linked. This project will study food markets in many locations, large cities as well as smaller towns, across Africa and Southeast Asia to address two interrelated overarching questions: (i) **How does conflict affect consumers' well-being by altering the proper functionality of food markets?** (ii) **How does conflict alter farmers' well-being by impacting their decision to strategically store their produce over the course of the post-harvest period?** In addressing these questions, this study will prepare an answer to two highly relevant policy-oriented questions: (iii) **Can we predict when, where, and how a conflict will lead to food insecurity?** (iv) **How can informal institutions mitigate conflict-related food insecurity?**

Aims

First, we will develop an innovative spatiotemporal framework that links market integration with (1) the rule of law and ethnic disparity within and between conflict-affected states; and (2) different types of conflict initiated by different types of conflict actors. **Second, we will use this framework to understand the effects of conflict on food security** in places that are geographically or ethnically detached from the rest of the country or region. **Third, we will apply the framework to elicit early warning signals of food crises and famines** in response to elevated levels of conflict and violence.

Background

With efficient movement of goods and information between markets, we would generally expect prices for the same goods to be similar in different cities thus eliminating opportunities for arbitrage. Likewise, with a capacity to store non-perishable goods, such as cereal grains for example, we would expect that prices for the same goods to only increase at par with storage costs over the crop marketing year. Any deviations from these “law of one price” states, both in spatial and temporal contexts, would indicate market inefficiencies.

In the spatial context, studies of market integration are oriented to finding the barriers that mean that prices are not the same (or do not adapt sufficiently swiftly) within the same countries, or between adjacent countries within a region. The primary suspects, as a barrier to market integration and full price transmission, are typically borders and distance. Dillon and Barrett (2016), for example, examine markets across East Africa and report an average elasticity of 0.42 of the local maize prices to the global maize price, with the measure ranging from 0.22 in Kenya to 0.82 in Ethiopia. Baquedano and Liefert (2014) analyse price transmission for the same four cereal grains that we consider in the present study, concluding that although local markets tend to be integrated with global markets, aggregate (cross-country) elasticities of price transmission from global to local markets range from 0.16 for sorghum to 0.32 for wheat, with country-specific elasticities ranging from indistinguishable from zero (e.g., for maize in Burkina Faso, Niger, and Zambia) to well in excess of 0.5 (e.g., 0.76 for rice in Senegal, or 0.73 for wheat in Ethiopia). Mengel and Cramon-Taubadel (2014) find that markets within a country are more likely to be co-integrated than markets between countries, while markets separated by great distances (both within and between countries) are slower to adjust prices and have lower co-integration. Distance has negligible effects between international markets. Borders do not always or necessarily align with sovereign dividers between countries. Ethnic division, which may segregate smaller regions within a country, or extend a region across two or more countries, may be a more apparent barrier to trade and, therefore,

to market integration (Aker et al., 2010, 2014). Likewise, distance is not only and necessarily measured in kilometres. For instance, a hundred-kilometre road connecting two cities may be associated with small or large amounts of transaction costs, depending on whether potential perpetrators tend to raid the people—traders in this instance—travelling the road.

In the temporal context, the lack of storage has been an ongoing issue for decades in many low- and middle-income countries (e.g., Kadio et al., 2018; Channa et al., 2022; Ricker-Gilbert et al., 2022). So much so that it has been dubbed the “storage puzzle” (e.g., Cardell and Michelson, 2023). Even if it is seemingly more profitable to retain the crop for a later resale, for example during the lean season, farmers opt for immediate disposal of the harvest. The lack of storage technology and liquidity constraints have been considered two key reasons for this. Empirical evidence points to a more complex issue, with other possible factors contributing to the lack of storage. Kadio et al (2018), for example, find that households in Benin store less when they expect to lose more during storage. Conflict and violence may have something to do with it. Farmers may choose to dispose of harvest as soon as possible to mitigate the risk of becoming a target of an attack by perpetrators.

Connecting market integration to institutional and other factors has been more tentative. Market integration of prices across a putative territory is a plausible method of determining whether the markets operate as if they are within a single country. The prevailing assumption and finding across many studies of states with fragmented, dysfunctional, or non-existent formal economic institutions is that there will be considerable price dispersion in different markets across relatively large distances (Aker, 2010; Aker and Fafchamps, 2014; Aker and Mbiti, 2010). Indeed, the main reasons for the lack of market integration in Africa are risk, lack of information, poor infrastructure, and lack of government capacity (Bouët et al., 2010). The lack of market integration in states without robust formal institutions could be for one or several reasons. First, the ability to broadcast power in Africa has been measured by the extent and location of road networks (Herbst, 2000), with the implication that states that are unable to exercise effective control are unable to build or maintain roads across the territory within their internationally defined borders. A lack of roads would increase transaction costs between different markets, resulting in a difference in market prices. Indeed, the cost of transport over low-quality roads is a major consideration in developing countries and is often a larger source of price dispersion than borders in many landlocked African countries (Dillon and Barrett, 2016; Minten and Kyle, 1999; Versailles, 2012).

Second, political fragmentation and violence mean that different, often hostile actors govern food markets in different parts of a country, and that traveling between markets, as well as outsider involvement in markets, is difficult due to poor security and barriers to moving between markets (Hastings et al., 2022), thus leading to an inability to efficiently move food around, to, or from a country. To that end, the presence of roads will not necessarily result in a spatial equilibrium between the markets—the presence of conflict actors along the road may serve as a barrier too big to overcome. Moreover, the lack of functioning formal state institutions means that state enforcement of contracts and resolution of disputes is patchy or uneven (Börzel et al., 2012; Krasner and Risse, 2014; Scott, 2010). While there are ways around a lack of state dispute arbitration, these methods do not necessarily scale well, or operate across larger distances or with strangers, including among ethnically diversified groups, making arms-length inter-city trade difficult, and resulting in differential prices (Greif, 1993; Haggard et al., 2012; Robinson, 2016). Non-political boundaries can also decrease market integration. In Africa, for example, ethnic boundaries serve as a barrier to integration (Aker, 2010; Aker et al., 2014). Thus, political fragmentation and conflict can affect market integration, which in turn can imperil populations’ food security.

INVESTIGATORS/CAPABILITY

The project team is structured so as to bring the project to a successful conclusion. Because the links between social conflict, commodity markets, and food security are inherently interdisciplinary, we draw investigators from both political science and economics, and bring expertise in multiple theoretical perspectives, methodologies, and geographic areas.

CI Ubilava has a strong background and an extensive list of publications in agricultural economics. He has studied the causes and consequences of disrupted commodity markets with emphasis on regime dependencies in international commodity price behaviour, and price co-integration within commodity groups. He will serve as project manager and take the lead on being particularly involved in the econometric analysis of price and conflict data.

CI Hastings has published extensively on security issues, political economy, and fragile states in both Africa, (primarily Somalia) and in East and Southeast Asia (primarily North Korea and Indonesia, as well as other countries in peninsular and archipelagic Southeast Asia). Hastings will be especially involved in providing substantive knowledge of countries in Africa and Southeast Asia, as well as developing methods to characterize the links between market integration, conflict, institutions, and food insecurity.

CI Vasnev is an expert in forecasting and business statistics, with a special interest in forecast combinations and model sensitivity. He will contribute to the assessment of time-series models and their forecasting performance. He will take the lead on managing and delivering the forecasting tool website.

CI Amarasinghe has worked extensively on the spatiotemporal dispersion of conflict and economic shocks, particularly in the African context, as well as for the world as a whole. In her recent work, she has demonstrated the importance of using massive datasets, with fine spatial and temporal granularity, in precisely measuring the effects of economic shocks. She will bring this expertise in to the econometric analyses within this project and will collaborate with Ubilava on handling this aspect of the project.

All members of the team will be involved in the publication and dissemination process. Hastings, Ubilava, and Vasnev in particular also already have experience co-authoring with each other, which will ease the team's ability to publish in high-quality international publications. All have extensive domestic and international collaborations and will use the project to further build Australian and international collaborations.

PROJECT QUALITY AND INNOVATION

Importance and innovation

We make several contributions to the study of market integration and food insecurity in conflict-affected states. First, we demonstrate the use of readily available price data as a way to understand internal dynamics in states with otherwise poor, biased, or non-existent data on formal institutions. Such data offer insights into the political processes that underpin either change or stasis within markets, such as the capacity to enforce rules, uphold contracts, and resolve disputes. Given that market prices are usually collected in daily or monthly increments in individual markets, and recent conflict data is collected to relative specificity, even in fragile states, this approach can also give us much greater granularity in understanding political and economic events in data-poor countries than has previously been the case. Most state capacity measures are on a yearly basis, with a country-level unit of analysis. More generally, governance data are simply often not available for many fragile states, and only states with data are being measured, which leads to an upward bias in data. That is, governance indicators may appear to be higher on average across the globe than they actually are because the lowest-performing countries are not included (Coggins, 2016). Moreover, the governance indicators that are available for virtually every country (such as the World Bank Governance Indicators) tend to exist only at the national level. While this is not a problem for countries that have relatively robust central governing institutions, it is a problem for those that do not, precisely because they are also more likely to have internal divisions that can hinder consistent levels of governance being applied across the entire country. Conflict and market integration analysis is a means of drawing out and measuring intra-country differences in governance.

Second, our innovation is to take market integration as a measure of other concepts at work in fragile states, including the potential for food insecurity. In doing so we rely on general understanding that differing levels of market integration are the result of impediments (such as distance, transport costs, and borders) to the transfer of information, goods, and people between markets. This is innovating on the idea that food prices in markets in particular are good indicators of a population's welfare and have been connected to instability and conflict in developing countries (Arezki and Bruckner, 2011; Hendrix and Haggard, 2015). Measuring the extent to which markets across a country or between countries are integrated, in terms of the dispersion or convergence of prices for the same items, or in terms of the extent to which prices change over the post-harvest season, can tell us about the nature, relevance and magnitude of potential barriers, notably conflict, to trade and to storage.

Third, our contribution is to create a forecasting platform to measure the potential for food crises in the face of conflict. To that end, each of the considered two dimensions—i.e., spatial, which measures the economic integration between markets, and temporal, which measures the seasonality of locally produced commodity prices—is important in and of itself. But they offer a unique possibility for additional insights when assessed in combination. The presence of locally produced crops (such as maize and sorghum in Africa, or rice in Southeast Asia), whether it is a subsistence farming or an export-oriented endeavour, adds a crucial aspect to our research, both conceptually and from a modeling standpoint. Price dynamics within sub-regions—e.g., comprising ethnically homogenous locations within a single country, or across several adjacent countries—can take peculiar patterns, particularly with respect to the integration of the region with the “outside world.” In the context of political conflict—which, in most instances, varies over time—this entails the possibility of regime-dependent dynamics vis-à-vis the conflict intensity. Hastings et al (2022) demonstrate this in the context of spatial integration using Somalia as the case study. That work, while pioneering in its own right, is geographically focused, and only addresses one, spatial dimension of the issue. The intra-year variability of prices, introduced in this project, is another important dimension that can contribute to creating a wealth of knowledge inferred from price behaviour over time and across space.

Approach

We take a three-fold approach to address the link between conflict and food security. The approach combines rigorous time series analysis of market integration and agricultural price forecasting, with a conceptual framework that links conflict, market integration, institutions, food security (and insecurity), and substantive knowledge of the formal and informal institutions across Africa and Southeast Asia.

First, we examine the role of conflict and political institutions on market integration within and across countries. Using local market price data, available via the Food and Agricultural Organisation of the United Nations, we can track price dispersion across markets and changes in price dispersion over time, conditional on the distance between markets, transport costs, and formal and informal geographic boundaries. This analysis builds on established research that looks at market integration, both within and between countries, as measured by price co-integration, price transmission speeds, or both (Goodwin et al., 2011; Dillon and Barrett, 2016). In a world where information about markets and prices is easily available, where transport costs are low, and where formal institutions provide minimal impediments and are well functioning, we would expect the difference in prices between cities to be low, inasmuch as traders would otherwise use the differences as an opportunity for arbitrage. In such an instance, which depicts the case of integrated markets, prices across two spatially separated but linked markets will co-move. Otherwise, price dynamics in the two markets are likely to be disentangled. Thus, by examining the features of the time series of price differentials in any two markets—i.e., whether the price differentials meander, thus resembling a random walk process, or follow a mean-reverting process, thus indicating price adjustments to the spatial equilibrium—we can present suggestive evidence about the potential economic linkage between the markets.

When a transaction cost of some sort is present—which is pretty much all the time insofar as a commodity is transported from one location to the other—there will be the so-called transaction cost band within which the difference between the two market prices will behave seemingly disentangled. This is because the arbitrage opportunity will not manifest due to the transaction cost. But the moment the price difference deviates beyond the band, the trade will happen, so long as the markets are integrated, and the price adjustment will follow.

In addition to the transportation costs, the distance between markets, the existence of internal and external borders, extreme weather, and terrible transport infrastructure are all likely to impede the smooth flow of people, information, and goods between markets, leading to slowdowns in price transmission, and dispersion of the prices of the same commodities across different markets. Conflict, which is common in fragile states, can pose particularly significant impediments to flows between cities, either because the markets themselves are destroyed, because the market participants are killed or dislocated, or because warring factions create borders between markets that are difficult to cross (Hastings et al., 2022). Moreover, because conflict intensity usually changes over time, so will the transaction costs band. Figure 1 illustrates this.

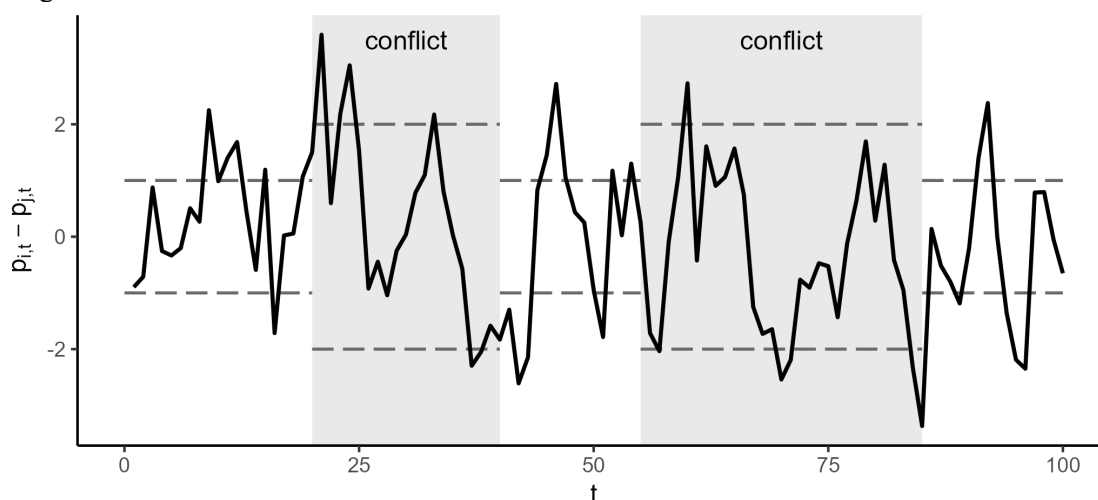


Figure 1: An illustration of a time-varying transaction costs band due to conflict (shaded regions).

The graph features the time series of a price differential between two spatially separated markets (i and j). When there is no conflict, the transaction costs band, depicted by dashed lines centred on zero, is narrow. During conflict (shaded regions), the band widens. Thus, by estimating the size of the transaction costs band, in times of peace and conflict, we are able to present evidence of conflict-related impediments to market integration. This example is intuitively appealing. Indeed, at the extreme, during the most severe forms of conflict such as wars, for instance, the transaction cost is insurmountable, leading to a complete disconnect between the markets.

The foregoing illustration alludes to our main approach for measuring market integration, or lack thereof, in absence of the trade data. By observing the features of the time series, comprising the price differentials between any two geographically linked markets, we will be able to present suggestive evidence of whether the markets are also economically linked, and to estimate the pass-through, that is, the extent to which a price change in one market results in a price change in another market, as well as the speed at which this price transmission happens.

Distance, borders, weather, and transport infrastructure can all lead to a permanent or temporary slowdown in price transmission or an increase in price dispersion. However, the conflict also leads to disruptions, which is associated with a decrease in market integration, and food insecurity. Conflict incidents, which are common in both Africa and

Southeast Asia, can pose significant problems to the flow of people, information, and goods (particularly food) between cities. The markets themselves might be destroyed, the market participants might be killed or flee, and battle lines may make movement difficult (Hastings et al., 2022). Conflicts initiated by civilians, such as protests and riots, are likely to have different impacts on market integration, and thus food insecurity than those started by armed groups (the state, militias associated with elites, or armed rebel groups), such as battles, explosions, or attacks on civilians (Raleigh et al., 2010). In Southeast Asia, for instance, farmers might initiate protests (which may or may not turn into riots) to pressure governments to buy their rice (as they have in Thailand and the Philippines), which could increase market integration, but could protest the government allowing rice imports (as they have in Indonesia and the Philippines), thus decreasing integration with foreign markets. Certain conflict incidents are also likely to cause food insecurity more directly, particularly given that conflict may increase during harvest seasons (Ubilava et al., 2022): state forces or rebel groups might attack civilians for the purpose of seizing or destroying food supplies of their enemies or enemies' supporters, or harassing (and thus disrupting) food supply chains between markets, as has happened repeatedly in Myanmar during the current civil war (Htay, 2022).

Second, we examine the effect of conflict on seasonal patterns of prices in crop-producing regions. Storage theory suggests a steady increase in prices of storable commodities, such as cereal grains, from the harvest month onward and into the lean season, leading to the next harvest season (Wright, 2001). The absence of such patterns would imply some deviation from the expectation. Empirical evidence points to such discrepancies (e.g., Cardell and Michelson, 2023). Conflict and political violence may play the role in this. If the availability of storable crops, such as cereal grains, attracts perpetrators (McGuirk and Burke, 2020; Ubilava et al., 2022), then it may explain farmers' incentives to sell their product at the earliest convenience—which is immediately after harvest. But the act of selling, as alluded to above, can be associated with the risk of being raided—*en route* to the market, for example. So, we could expect heterogeneity in the patterns, conditional on the prevalence of paramilitary groups in the region, the strength of the state institutions, and the distance of the agricultural region from the nearest city—the likely market for agricultural goods.

Observational data on farmers' storage (like it was in the case of the trade data) are largely unavailable. But we can use price data, observed at a monthly frequency, to elicit suggestive evidence of storage practices in the region. One of the key effects of storage is that it stabilizes prices over time (Wright, 2001). Figure 2 illustrates this.

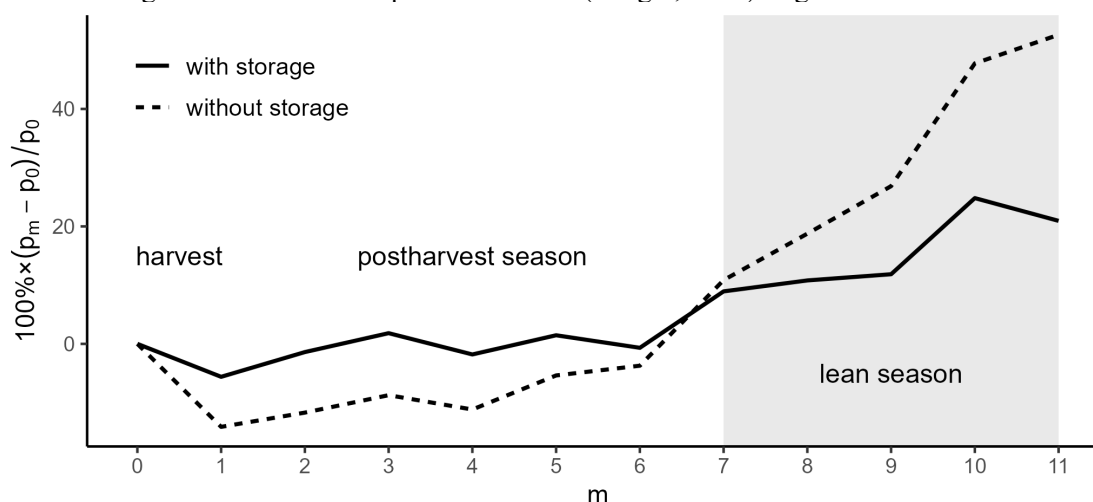


Figure 2: An illustration of seasonal patterns of price with (solid) or without (dashed) storage.

The graph presents prices in percentage terms relative to that during the harvest month (denoted by zero on the horizontal axis). In absence of storage, there will be an abundance of the agricultural commodity just after harvest, which would push prices down, and scarcity during the lean season—before the next year's crop is harvested, which would push prices up. Such a seasonal pattern is given by the dashed line on the figure. With storage, both the post-harvest price drop and the lean-season price surge will be mitigated, as illustrated by the solid line in the figure.

In our empirical exercise, we can compare the seasonal patterns of locally produce commodity prices between high-conflict and low-conflict regions, to find out if conflict motivates or discourages storage, all else held constant.

Third, we bring in the concept of informal institutions as potentially mitigating the links between conflict and food insecurity. We understand informal institutions, particularly in fragile states, to be mechanisms that constrain or enable behaviour but that do so outside of public or officially sanctioned channels (Helmke and Levitsky, 2004, 727). This includes the capacity to enforce contracts, resolve disputes, and sanction behaviour outside of state-based mechanisms. Non-state institutions can fulfill these roles by providing information about traders to potential and actual counterparties, building reputations for traders so they can minimize transaction costs with people they do not know, and punishing defecting traders through damage to their reputations (Clay, 1997; Greif, 1993; Johnson et al., 2002; McMillan and Woodruff, 1999a, 1999b; Milgrom et al., 1990). Informal institutions—or more accurately, informal ties that are not

captured by formal state-based institutions—can mitigate the problems created by the lack of formal institutions, or even those caused by conflict (Aker et al., 2014), for instance, in a paper on agricultural prices in Niger and Nigeria find that the interaction between ethnicity and borders can lead to drastic price dispersion: close-by markets on either side of the border showed large price dispersion. This dispersion was mitigated when the cross-border markets were controlled by the same ethnic group. Conversely, markets within Niger controlled by different ethnic groups had the same price dispersion as markets in different countries, suggesting that co-ethnicity can function as an important informal lubricant in market transactions in situations where formal institutions are not strong.

Since it is difficult to measure the functioning of informal institutions directly, we look at whether levels of market integration (or dispersion) or the changes in levels of market integration over time are more or less than expected given the structural impediments to integration, including across battle lines in the case of conflict. Our earlier work (Hastings et al., 2022), for instance, finds that price transmission in Somalia is surprisingly robust, which hints at the extent to which informal institutions are functioning, or even obviating formal institutions. A potential explanation for this is that informal institutions that allow Somalis to build trust, exchange information, and enforce contracts have flourished in Somalia in the wake of the collapse of centralized political authority, and that allow Somalis to do business across barriers that retard, but do not completely sever, the movement of information, goods, and people between markets. Somalis' ability to soldier on in the face of conflict is notable. Conversely, some types of conflict may themselves be examples of informal links and ties that may mitigate market disruptions. For example, farmers' protests across a country may show a network of people and communication across a country's territory, and even a rebel group's activity within a given territory may suggest alternative governance in part of a country that could facilitate market integration within a part of a country.

Methodology

Using the approach outlines in the previous section, we will conduct a market integration analysis for Africa and Southeast Asia. The two regions, as well as countries within these regions, differ from each other considerably, with widely ranging socio-economic characteristics. The most marginalized of the states do not even make the list of countries ranked by the United Nations Development Programme (UNDP) Human Development Index, and, particularly in Africa, those that do make the list, do not rank very high. We chose these two regions for several reasons. Africa as a region is the frequent subject of studies on conflict and climate (Maystadt and Ecker, 2014; Koren, 2019; McGuirk and Burke, 2020), and separately, on market integration (Hastings et al., 2022; Abay et al., 2023), and has a wealth of data on conflict, food markets, climate, and market integration. As such, it is useful as a baseline with which to compare the results of this project with others' results. Southeast Asia, by contrast, is relatively understudied, partly due to data limitations. For its part, Southeast Asia has extensive, varied conflict throughout the region, but also a high level of variation in human development across countries, ranging from Singapore and Brunei at the top to Myanmar and Timor-Leste at the bottom. Southeast Asia is also largely a food-exporting region, which presents different food security problems from Africa. It is useful to look at Southeast Asia as a region with varying conflicts and development levels to see whether conflict's effects on market integration, and thus food security, vary depending on the type of conflict, development, governance, or ethnic cleavages. Southeast Asia is also a region of critical strategic importance to Australia. We then link the market integration results with quantitative and qualitative data on conflict, borders, policy changes, and exogenous shocks, as well as market participants' perceptions of all these issues.

Geography and data

We will source the data on conflict incidents from the Armed Conflict Location & Event Data Project (ACLED), available at <https://acleddata.com>, which tabulates several categories of daily conflict incidents, such as armed clashes, violence against civilians, changes of territory control, etc, and includes the types of actors involved. This dataset has been increasingly used in conflict studies. We will supplement this dataset with highly granular, both spatially and temporally, event data sourced from the GDELT Project, available at <https://www.gdeltproject.org>, which gathers information from global news media articles to provide a real-time open data global graph of human society. This dataset enables the quantification of activities by various socioeconomic agents at very fine temporal intervals, for example at the hour, day week, or month level, as demonstrated in Amarasinghe (2022, 2023). We will use food price data collected by international organizations such as the Humanitarian Data Exchange, <https://data.humdata.org/>, and the Global Information and Early Warning System, <https://www.fao.org/gIEWS/en/>, across a large set of cities, covering regions that include countries that are apparently economically integrated (among each other as well as the world) as well as countries with sub-regions that are for the purposes of governance, with a relatively distinct—though fluid—border with other regions, particularly during times of conflict. Such geographic heterogeneity will allow us to examine several interesting hypotheses related to spatial and temporal market integration. In the case of Africa, we will use data on the homelands of ethnic groups from Murdock (1959), which will allow us to examine the effect of the rich ethnic roots of informal institutions.

Research plan

1. Collect and impute time series data; map out markets and networks in Africa and Southeast Asia (Year 1)

The data in fragmented economies are often incomplete or insufficient for traditional time-series analysis. We can deal with a small proportion of missing observations using a Kalman filter of Hamilton (1994). For a relatively short series, we need to extend our modelling to the class of so-called global models. Global models emerged as winners in the recent M4 and M5 forecasting competitions by Makridakis et al. (2018) and Makridakis et al. (2022). They fit a single model for a wide range of the available time series. The model is still univariate, but the parameters are fitted using the neural network method to achieve good out-of-sample performance for all series. Once the model is estimated it can be used for forecasting very short time series.

Global models have a variety of applications, for example, Amazon DeepAR use them to predict the sales of new products based on the previous launches of similar products. This methodology had an explosive development in the 'big data' era with the recent advances in artificial intelligence and machine learning. Global models have not been yet applied to fragmented economies. The benefits could be enormous as global models will allow prediction using much smaller data than the traditional models. Since data availability is one of the biggest challenges in low- and middle-income countries, the global model will allow us to deal with this challenge in the most effective way.

Using the publicly available data on prices and roads (OpenStreetMap), we will map the network of markets across Africa and Southeast Asia. This exercise will set the stage for the subsequent econometric analysis of the data. We will construct the markets network so that each market (city or town) is linked to at least one other market. We will determine the most likely "trade partner" based on the type and quality of the road connecting the two markets, supplemented by any available auxiliary information about the existing patterns of trade. We will complement these road networks with networks based on geographic and ethnic connectivity, expanding on methods developed by Amarasinghe et al. (2020).

2. Examine markets and food insecurity in presence of conflict, ethnic linkages, and informal institutions (Years 1-2)

We will use market integration across locations and over time as a means of accounting for the functioning of formal and informal institutions, and to see how a decrease in market integration and shocks to prices can lead to potential food insecurity. In the quantitative analysis, we treat factors (internal and external) that can impede the flows of information, people, and goods between markets as shocks that may slow down price transmission speed or temporarily cease market integration entirely. In terms of the ability of (informal) institutions to function in the face of conflict, however, not all conflicts are the same. A conflict wherein government or rebel forces are actively attempting to take over territory, as well as different types of armed violence, is anticipated to be more disruptive to the existing linkages among the markets, than protests and riots, which typically are localized in central districts of a city, and often are seen as a consequence rather than the cause of price dispersion among the markets (Bellemare, 2015). Moreover, because ACLED maintains records of the change of control (either peaceful or due to an armed conflict), by tracing such data points, we will be able to recover the timeline of a territory's control by the central government or the rebel group. This will allow us to identify the subset of regions under common governance, be that formal or informal.

In the presence of conflict, the effect is essentially to create borders between markets that may or may not be permeable, and to change market participants' behaviour. The extent to which market price integration responds to these shocks both serves as an indicator of food insecurity in different areas and suggests the presence (or lack thereof) of informal institutions. To overcome these barriers, social networks, which provide credit, information, and dispute resolution to reduce transactions are perhaps the underlying factor in the functioning of informal institutions. We can bring in narrative data on specific countries from secondary sources to explore the mechanisms by which market participants change behaviour and decrease costs associated with moving people, goods, and information between markets within the country, and between the country and overseas markets, in the face of dysfunctional formal institutions and the shocks.

In all cases where data allows, we will measure how forecastable the time series is and benchmark it against the markets of the developed economies. The working hypothesis that emerged from the preliminary analysis is that the time series in fragmented states can still be predicted using standard statistical models. Different economic environments can generate prices that exhibit similar statistical properties. To the best of our knowledge, this analysis was never performed for fragmented economies.

3. Disseminate the results to stakeholders (Years 2-3)

We will disseminate the results to stakeholders in accessible ways designed to maximize the uptake of the findings and the framework. For scholars, we will (i) organize workshops as a platform for sharing knowledge; (ii) present the findings at international conferences; and (iii) publish journal articles in high-impact journals. For government policymakers and non-governmental organizations in the humanitarian aid and governance sectors, we will develop (i) a briefing and a white paper outlining the results and the framework; and (ii) a forecasting website tool for generating short- and intermediate-term forecasts of local food prices, which will serve as an indicative measure for food

affordability. The team has experience in creating high-quality public websites (e.g., our previous website business-forecast-lab.com). A website serves as an intuitive tool that makes the outcomes of this project accessible to the wider community. Anyone with internet access can easily obtain predictions of grain prices and market integration measures together with the uncertainty around them. This feature is especially important for the two regions in consideration as there are fewer online resources that cater to the needs of these parts of the world. The website will include traditional forecasting models as well as novel methods developed by the team. The website will visualize and summarize the forecasting results in an easy-to-understand manner. The forecasts will be updated regularly to account for the latest available information.

BENEFIT

Significance

This project is significant for two key reasons. First, it provides a new way to understand how the political economies of conflict-affected fragile states actually function. Focus is on informal institutions that are always there but are often unseen and unmeasured. Much of the international community's aid for marginalised, developing states is oriented, understandably, toward improving and consolidating formal institutions—courts, law enforcement, finance and trade ministries, customs, and the like. However, in states with high levels of conflict or other impediments to internal governance, buttressing informal institutions—e.g., building trust networks, encouraging information flows, and finding informal ways to enforce agreements—may be more immediately effective than programs focused on formal institutions. Second, it focuses on advancing knowledge that can be immediately useful to development organizations that tackle food crises and famines in low- and middle-income countries. By linking the integration of cereal markets across and between countries with state capacity, the project outputs will benefit international bodies such as the World Bank, the United Nations Development Program, and the World Food Program, in targeting their programs and understanding the connection between market functionality and governance within a country.

Benefit to Australia

This project falls within the Science and Research Priority of “Food” and addresses the Practical Research Challenge of “Knowledge of global and domestic demand, supply chains, and the identification of country-specific preferences for food Australia can produce.” As such, the project and its outcomes have several specific benefits for Australia. First, by developing alternative ways of understanding governance and market function in developing countries, the project will improve the ability of the Australian government to target its aid for maximum practical effect, and for maximum influence, in Africa and Asia, particularly Southeast Asia.

Second, the project develops an accessible framework to understand cereal market integration within and between countries, and to forecast both cereal market prices and the extent to which a country's formal and informal institutions are facilitating (or not) trade between internal and external markets, as well to understand the effects of conflict on food prices and market integration. As such, the outcomes, particularly the framework and the forecasting tools will be useful to industry—such as cereal exporters—that wants to understand the demand for Australian cereals in many developing Asian and African countries, and the effects that political and economic risks, such as conflicts, are likely to have on that demand, and the extent to which those countries are integrated into global supply chains. In practical and intellectual terms, this project will burnish Australia's international development credentials, and improve the ability of the Australian government and industry to build political and economic influence in developing countries, particularly in Africa and Asia. In particular, the results can help Australia understand where there are likely to be food insecurity issues, based on the locations and types of conflict and the effects on market integration, storage, and prices, thus allowing Australian aid organisations to strategically pinpoint where and when to send aid.

FEASIBILITY

The main feasibility concern with any empirical project, specifically when dealing with low-income and marginalised states, is obtaining access to those states and collecting reliable and accurate data. Maximizing feasibility is baked into the purpose and design of the project. First, the project's main purpose is to take data that are already relatively widely available, specifically for low- and middle-income countries—cereal market prices and conflict data—and apply an innovative framework to provide insights into conflict, markets, and institutions that would not otherwise be possible due to the nature of the states under study. In this, the poor data environment is an advantage for our project, inasmuch as the value added by our analysis will be greater than for states with better data.

Second, the project is designed to take advantage of data that we have already collected or to which we already have access (e.g. via the Food and Agriculture Organization of the United Nations' Food Price Monitoring and Analysis tool), obviating problems of data collection that would usually be the case with the study of marginalised states, reducing the susceptibility of the project to travel restrictions, and minimizing the costs associated with data collection and fieldwork.

The implementation of existing methodologies and the use of previously developed tools guarantee the project's feasibility. This includes models and methods already developed by the CIs independently as well as, importantly, in collaboration (Amarasinghe et al., 2020; Hastings et al., 2022; Ubilava et al., 2022). This will be aided by research input from a PhD student, and a Research Assistant with a suitable programming background. In Years 1 and 2, the RA will assist with data sourcing and management, particularly as they relate to “data cleaning,” which will facilitate the accurate matching of the price and conflict data. In Years 2 and 3, they will integrate and automate new data sources into the existing website structure, as well as implement Machine Learning methods for global models, and the Kalman filter for missing observations. The University of Sydney provides excellent graduates that can be employed on this project, as well as access to the Sydney Informatics Hub. The CIs have drawn on the Hub’s expertise in implementing multiple projects with similar demands.

Implementation plan

	Year 1	Year 2	Year 3
Research	<ul style="list-style-type: none"> - Framework development - Address missing data issues in commodity prices - Map markets and roads across Africa, Southeast Asia 	<ul style="list-style-type: none"> - Examine hypotheses of spatial and temporal linkage in the wake of conflict - Link market inefficiencies and institutional capacity 	<ul style="list-style-type: none"> - Generating short- and intermediate-term forecasts of prices of food and agricultural commodities in conflict-affected states - Write-up
Publication and dissemination	<ul style="list-style-type: none"> - Paper 1 (framework) - Presentation, International Studies Association (ISA) Annual Convention (San Francisco) - Organized workshop on markets and institutions in conflict-affected states. 	<ul style="list-style-type: none"> - Papers 2 & 3 (spatial integration & storage) - Presentation, ISA (Chicago) - Presentation, Centre for the Study of African Economies (CSAE), Oxford, UK. - Presentation, Royal Economic Society (RES) Annual Conference, UK. - Presentation, Allied Social Science Associations (ASSA) Annual Meeting (San Francisco) - Organized workshop on markets and institutions in conflict-affected states. 	<ul style="list-style-type: none"> - Paper 4 (institutional capacity and market efficiency) - Presentation, ISA (Columbus) - Presentation, ASSA (Philadelphia) - Organized workshop on markets and institutions in conflict-affected states. - Briefings at DFAT - Web tool online

COMMUNICATION OF RESULTS

Dissemination will be differentiated to maximize uptake by different communities.

- For academics**, we will publish at least four articles (one on the framework itself, one on spatial integration, one storage, and one on institutional capacity and market efficiency) in leading, high-impact political science, economics, and development journals such as *World Development*, *Food Policy*, *American Journal of Agricultural Economics*, *Journal of Development Economics*, *Journal of Public Economics*, *International Studies Quarterly*, *Political Geography*, and *African Affairs*. All have previously published our work. We will also commence the series of annual workshops on markets and institutions in conflict-affected states.
- For policymakers and aid organisations**, we will prepare and deliver a briefing paper that lays out the framework in accessible terms, presents the results, and gives recommendations for development, targeted aid, and foreign policy. In Canberra, we will brief DFAT’s foreign development and aid programs, and the Southeast Asia and Africa teams, and train government analysts and aid workers in the use of the forecasting tool website.
- For a sustainable benefit to analysts and the wider public**, we will write a series of short pieces to be published in high-visibility venues, and create a website that will (1) automatically import market price data for Africa and Southeast Asia as they are produced; (2) visualize market price data; (3) forecast cereal grain prices and market integration within countries and across regions based on different modelled scenarios, including those where conflict intensity varies.

REFERENCES

- Abay, K. A., Abdelfattah, L., Breisinger, C., & Siddig, K. (2023). Evaluating cereal market (dis) integration in less developed and fragile markets: The case of Sudan. *Food Policy*, 114, 102399.
- Aker, J. C. (2010). Information from markets near and far: Mobile phones and agricultural markets in Niger. *American Economic Journal: Applied Economics*, 2(3), 46-59.

- Aker, J. C., & Fafchamps, M. (2014). Mobile phone coverage and producer markets: Evidence from West Africa. *The World Bank Economic Review*, 29(2), 262-292.
- Aker, J. C., Klein, M. W., O'Connell, S. A., & Yang, M. (2014). Borders, ethnicity and trade. *Journal of Development Economics*, 107, 1-16.
- Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207-232.
- Amarasinghe, A., Raschky, P., Zenou, Y & Zhou, J. (2020). Conflicts in spatial networks. *CEPR Discussion Paper No. DP14300*.
- Amarasinghe, A. (2022). Diverting domestic turmoil. *Journal of Public Economics*, 208, 104608.
- Amarasinghe, A. (2023). Public sentiment in times of terror. *Journal of Development Economics*, 162, 103058.
- Arezki, M. R., & Bruckner, M. (2011). *Food prices and political instability*: International Monetary Fund.
- Bellemare, M. F. (2015). Rising food prices, food price volatility, and social unrest. *American Journal of Agricultural Economics*, 97(1), 1-21.
- Börzel, T. A., Hönke, J., & Thauer, C. R. (2012). Does it really take the state? *Business and Politics*, 14(3), 1-34.
- Bouët, A., Cosnard, L., & Laborde, D. (2017). Measuring trade integration in Africa. *Journal of Economic Integration* 32(4), 937-977.
- Brinkman, H.-J., & Hendrix, C. S. (2011). *Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges*, World Food Programme.
- Burke, J., & Ahmed, A. (20 December 2017). Survivors of the Mogadishu market bomb: 'Our life is destroyed. There is no more to say'. *The Guardian*.
- Clay, K. (1997). Trade without law: Private-order institutions in Mexican California. *Journal of Law, Economics, and Organization*, 13(1), 202-231.
- Coggins, B. L. (2016). Failing and the Seven Seas? Somali Piracy in Global Perspective. *Journal of Global Security Studies*, 1(4), 251-269.
- Dillon, B. M., & Barrett, C. B. (2016). Global Oil Prices and Local Food Prices: Evidence from East Africa. *American Journal of Agricultural Economics*, 98(1), 154-171.
- Dua, J., & Menkhaus, K. (2012). The Context of Contemporary Piracy: The Case of Somalia. *Journal of International Criminal Justice*, 10(4), 749-766.
- Goodwin, B. K., Holt, M. T., & Prestemon, J. P. (2011). North American oriented strand board markets, arbitrage activity, and market price dynamics: a smooth transition approach. *American Journal of Agricultural Economics*, 93(4), 993-1014.
- Greif, A. (1993). Contract enforceability and economic institutions in early trade: The Maghribi traders' coalition. *American Economic Review*, 83, 525-548.
- Haggard, S., Lee, J., & Noland, M. (2012). Integration in the absence of institutions: China-North Korea cross-border exchange. *Journal of Asian Economics*, 23(2), 130-145.
- Hamilton, J. (1994). *Time series analysis*. Princeton: Princeton University Press.
- Hastings, J. V., Phillips, S.G., Ubilava, D., & Vasnev, A. (2022). Price Transmission in Conflict-Affected States: Evidence from Cereal Markets of Somalia. *Journal of African Economies* 31(3), 272-291.
- Hendrix, C.S., & Haggard, S. (2015). Global food prices, regime type, and urban unrest in the developing world. *Journal of Peace Research*, 52(2), 143-157.
- Herbst, J. (2000). *State and Power in Africa: Comparative Lessons in Authority and Control*. Princeton: Princeton University Press.
- Htay, Y. (2022, November 30). *Myanmar Food Security Threatens Regional Stability*. Retrieved February 7, 2023, from <https://teacircleoxford.com/politics/myanmar-food-security-threatens-regional-stability/>
- Johnson, S., McMillan, J., & Woodruff, C. (2002). Courts and relational contracts. *Journal of Law, Economics, and Organization*, 18(1), 221-277.
- Koren, O. (2019). Food Resources and Strategic Conflict. *Journal of Conflict Resolution*, 63(10), 2236-2261
- Krasner, S. D., & Risse, T. (2014). External actors, state-building, and service provision in areas of limited statehood: Introduction. *Governance*, 27(4), 545-567.
- Lee, S. K. (2015). Behind the scenes: Smuggling in the Thailand-Myanmar borderland. *Pacific Affairs*, 88(4), 767-790.
- Makridakis, S., E. Spiliotis, & Assimakopoulos, V. (2018). The M4 competition: Results, findings, conclusion and way forward. *International Journal of Forecasting* 34, 802-808.
- Makridakis, S., E. Spiliotis, & Assimakopoulos, V. (2022). The M5 accuracy competition: Results, findings, and conclusions. *International Journal of Forecasting* 38, 1346-1364.
- Maystadt, J.-F. & Ecker, O. (2014). Extreme Weather and Civil War: Does Drought Fuel Conflict in Somalia Through Livestock Price Shocks? *American Journal of Agricultural Economics* 96(4), 1157-1182.
- McGuirk, E. & Burke, M. (2020). The Economics Origins of Conflict in Africa. *Journal of Political Economy* 128, 3940-3997.
- McMillan, J., & Woodruff, C. (1999a). Dispute prevention without courts in Vietnam. *Journal of Law, Economics, and Organization*, 15(3), 637-658.
- McMillan, J., & Woodruff, C. (1999b). Interfirm relationships and informal credit in Vietnam. *Quarterly Journal of Economics*, 114(4), 1285-1320.
- Mengel, C., & Cramon-Taubadel, S.V. (2014). *Distance and border effects on price transmission: a meta-analysis*. GlobalFood Disc. Papers.
- Milgrom, P. R., North, D. C., & Weingast, B.R. (1990). The role of institutions in the revival of trade: The law merchant, private judges, and the Champagne fairs. *Economics and Politics* 2(1), 1-23.
- Minten, B., & Kyle, S. (1999). The effect of distance and road quality on food collection, marketing margins, and traders' wages: evidence from the former Zaire. *Journal of Development Economics* 60(2), 467-495.
- Murdock, P. (1959). *Africa: Its Peoples and their Culture History*. New York: McGrawHill Book Company.
- Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED: An Armed Conflict Location and Event Dataset: Special Data Feature. *Journal of Peace Research* 47(5), 651-660. <https://acleddata.com/>.
- Robinson, A. L. (2016). Internal Borders: Ethnic-based market segmentation in Malawi. *World Development* 87, 371-384.
- Scott, J. C. (2010). *The art of not being governed: An anarchist history of upland Southeast Asia*. Singapore: NUS Press.
- Ubilava, D., Hastings, J. V., & Atalay, K. (2022). Agricultural windfalls and the seasonality of political violence in Africa. *American Journal of Agricultural Economics*. Published online first.
- Versailles, B. (2012). *Market integration and border effects in Eastern Africa*: Centre for the Study of African Economies.
- Wright, B. (2001). *Storage and price stabilization*. Handbook of agricultural economics, 1, 817-861.

Part E - Project Cost (DP240101563)

E1. What is the proposed budget for your project?

(There are rules around what funds can be requested from the ARC. You must adhere to the scheme specific requirements listed in the grant guidelines. Refer to the Instructions to Applicants for detailed instructions on how to fill out the budget section.)

Total requested budget: \$213,144

Year 1

Description	ARC	Admin Org	
	Cash	Cash	In-kind
Total	64,434	15,077	194,114
Personnel	39,434	8,337	194,114
CI Ubilava Level D Steps 2-4 @ 0.2 FTE			48,054
CI Hastings Level E @ 0.2 FTE			58,880
CI Vasnev @ 0.2 FTE			50,370
CI Amarasinghe @ 0.2 FTE			36,810
HDR (Higher Degree by Research stipend)	28,870	8,337	
3 x RA @ HEO 6/1 x FT0.2 FTE	10,564		
Teaching Relief	25,000		
Teaching Relief for Prof Justin Hastings	25,000		
Travel		6,740	
CI International Conference Travel		6,740	

Year 2

Description	ARC	Admin Org	
	Cash	Cash	In-kind
Total	89,373	25,326	199,787
Personnel	34,373	8,337	199,787
CI Ubilava Level D Steps 2-4 @ 0.2 FTE			50,645
CI Hastings Level E @ 0.2 FTE			60,132
CI Vasnev @ 0.2 FTE			51,427
CI Amarasinghe @ 0.2 FTE			37,583
HDR (Higher Degree by Research stipend)	28,870	8,337	
3 x RA @ HEO 6/1 x FT0.2 FTE	5,503		
Teaching Relief	25,000		
Teaching Relief for A/Prof David Ubilava	25,000		
Travel	30,000	16,989	
CI International Conference Travel	30,000	16,989	

Year 3

Description	ARC	Admin Org	
	Cash	Cash	In-kind
Total	59,337	16,057	204,782
Personnel	40,337	8,337	204,782
CI Ubilava Level D Steps 2-4 @ 0.2 FTE			52,507
CI Hastings Level E @ 0.2 FTE			61,395
CI Vasnev @ 0.2 FTE			52,507
CI Amarasinghe @ 0.2 FTE			38,373
HDR (Higher Degree by Research stipend)	28,870	8,337	
3 x RA @ HEO 6/1 x FT0.2 FTE	11,467		
Travel	19,000	7,720	
CI International Conference Travel	19,000	7,720	

E2. Justification of funding requested from the ARC

(Fully justify, in terms of need and cost, each budget item requested from the ARC. Use the same headings as in the Description column in the Budget Table of this application (upload a PDF of up to 4 A4 pages and within the required format).)

Budget Justification

Uploaded PDF file follows on next page.

E2 - Justification of funding requested from the ARC DP240101563

Cost Description	Total Cost	Justification
Personnel		
<i>All Personnel salaries have been costed at applicable University of Sydney academic and professional staff rates and include 30% oncosts</i>		
HDR (Higher Degree by Research stipend)	\$86,610	<p>Funding is requested for an HDR stipend – this HDR appointment will help the student to develop skills and expertise in the interdisciplinary area of research connecting political science, economics, and data analytics. Upon completion, the student is expected to have co-authored papers with the Project team and be positioned to successfully apply for positions in governmental or nongovernmental sectors, including in academia.</p> <p>Year 1: \$28,870; Year 2: \$28,870; Year 3: \$28,870</p>
Research Assistants x 3 @ HEO 6/1	\$27,534	<p>Funds are requested for 3 Research Assistants (RAs) over the life of project. In Year 1, the RA will be employed to assist with data collection and analysis, and conducting programming work to translate geographically granular data into format applicable to the research needs of the Project. In Year 2, the RA will be employed to help with literature review and data analysis. In Year 3, the RA will be employed to set up the online platform for early warning of food crises and famines based on price and conflict data.</p> <p>The RAs will each be employed for one day a week @ FTE 0.2 for 20 weeks in Year 1 and 3 of the project, and for 10 weeks in Year 2 of the project.</p> <p>Year 1: \$10,564; Year 2: \$5,503; Year 3: \$11,467</p>
Teaching Relief		
Teaching Relief for CI Ubilava and Hastings	\$62,500	<p>Teaching relief has been requested by CIs Ubilava and Hastings. The teaching relief will allow Hastings the time to take the lead in developing a conceptual framework across papers of the project, advising the PhD student in their commencing year of studies, and pulling together the policy brief for stakeholders. The teaching relief will allow Ubilava the time to take the lead in overseeing each stage of the project,</p>

		<p>including supervising the PhD student during their crucial second year of studies, managing the RAs, doing the data work and econometric analysis, and arranging the dissemination trips, and presenting the papers at conferences.</p> <p>CI Hastings has requested 50% teaching relief in Year 1 of the project; CI Ubilava has requested 50% teaching relief in Year 2 of the project.</p> <p>Year 1: \$25,000; Year 2: \$25,000</p>
Travel		
<i>All travel is costed at economy rates in line with university travel policy, excludes GST and calculates regional domestic accommodation and all domestic and international living allowances at 70% of ATO rates.</i>		
CI International Conference Travel	\$49,758	<p>Funds are requested to cover CI international conference travel in each year of the project. The conference participation is crucial for successful completion of this Project, as it affords the opportunity to share the preliminary findings of the work and receive much necessary feedback, which will factor in further development of papers that would lead to peer-reviewed publications. Disseminating research in this way is an accepted and, indeed, anticipated avenue for raising awareness and impact of the research.</p> <p>International Conference Travel is based on attendance at any of the following conferences: International Studies Association (ISA), Royal Economic Society (RSE), Centre for the Study of African Economies (CSAE) and ASSA. ISA and ASSA conferences are typically held in the USA and RSE/CSAE are held in the UK.</p> <p>US travel is costed as return economy airfare (\$4090), accommodation x 5 nights (\$970), living allowance at 70% ATO rates for 5 days (840) and ground transport at \$260. Total \$6160</p> <p>UK travel is costed as return economy airfare \$2642, accommodation x 5 nights \$1054, living allowance at 70% of ATO rates x 5 days \$840 and ground transport \$220. Total = \$4756</p>

		<p>Registration fees are included in requested funds for each US and UK conference and exchange rates have been calculated on Oanda.com as of 7 Feb 2023.</p> <p>Budgeting in each year has accounted for one or more CIs to attend a combination of US and UK conferences, depending on individual specialties. In Year 1 and 3, the School of Economics at the University of Sydney will contribute towards international conference travel.</p> <p>Year 1: \$0; Year 2: \$30,000; Year 3: \$19,000</p>
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E3. Details of non-ARC contributions

(Provide an explanation of how non-ARC contributions will support the proposed project. Use the same headings as in the Description column in the Budget Table of this application (upload a PDF of up to 2 A4 pages and within the required format).)

Details of Non-ARC Contributions

Uploaded PDF file follows on next page.

E3 – Details of Non-ARC Contributions ARC DP240101563

Cost Description	Total Cost	Justification
Personnel		
<i>All Personnel salaries have been costed at applicable University of Sydney academic and professional staff rates and include 30% oncosts</i>		
CIs Ubilava, Hastings, Vasnev and Amarasinghe	\$598,683	<p>The University will contribute an in-kind total of \$598,638 towards the project in the form of CI time. Each CI will devote 0.2 FTE on the project; costing is based on current academic Level and step and includes 30% oncosts.</p> <p>Year 1: \$194,114; Year 2: \$199,787; Year 3: \$204,782</p>
HDR (Higher Degree by Research stipend)	\$25,011	<p>An HDR stipend is requested from the ARC for all years of the project; The Faculty of Arts at the University of Sydney will commit to topping up the ARC HDR stipend to match the 2023 University RTP rate of \$37,207 p.a. This amount to \$25,011 over the life of the project.</p> <p>The HDR appointment will help the student to develop skills and expertise in the interdisciplinary area of research connecting political science, economics, and data analytics. Upon completion, the student is expected to have co-authored papers with the Project team and be positioned to successfully apply for positions in governmental or nongovernmental sectors, including in academia.</p> <p>Year 1: \$8,337; Year 2: \$8,337; Year 3: \$8,337</p>
Travel		
<i>All travel is costed at economy rates in line with university travel policy, excludes GST and calculates domestic accommodation and all domestic and international living allowances at 70% of ATO rates.</i>		
CI International Conference Travel	\$31,449	<p>While funds are requested for CI international conference travel in years 2 and 3 of the project, the School of Economics at the University of Sydney will commit to covering some costs in each year. The conference participation is a widely accepted crucial step for sharing the preliminary findings to receive much necessary feedback for further development of papers into the peer-reviewed publications.</p>

		<p>As for requested ARC funds, International Conference Travel is based on attendance at any of the following conferences: International Studies Association (ISA), Royal Economic Society (RSE), Centre for the Study of African Economies (CSAE) and ASSA. ISA and ASSA conferences are typically held in the USA and RSE/CSAE are held in the UK.</p> <p>US travel is costed as return economy airfare (\$4090), accommodation x 5 nights (\$970), living allowance at 70% ATO rates for 5 days (840) and ground transport at \$260. Total \$6160</p> <p>UK travel is costed as return economy airfare \$2642, accommodation x 5 nights \$1054, living allowance at 70% of ATO rates x 5 days \$840 and ground transport \$220. Total = \$4756</p> <p>Registration fees are included in requested funds for each US and UK conference and exchange rates have been calculated on Oanda.com as of 7 Feb 2023.</p> <p>Budgeting in each year has accounted for one or more CIs to attend a combination of US and UK conferences, depending on individual specialties. In Year 1 and 3, the School of Economics at the University of Sydney will contribute towards international conference travel.</p> <p>The School of Economics will cover the following:</p> <p>Year 1: \$6,740; Year 2: \$16,989; Year 3: \$7,720</p>
Other		
Workshop	\$17,742	<p>Funds to host an annual workshop at the University of Sydney, years 1-3. Costing includes venue hire (\$150), 1 x domestic keynote speaker travel (flights \$400, accomm \$400, transport \$200 and living allowance @ 70% ATO rates \$284) \$1284, plus catering @ \$77pp, consumables @ \$6pp, and event assistance at HEO 5/1 including oncosts, \$850. Costing also includes a workshop dinner in each year for 12 guests, \$1,140.</p> <p>Year 1; \$5,914; Year 2: \$5,914; Year 3; \$5,914</p>

Part F - Participant Details including ROPE (A/Prof David Ubilava)

F1. Personal Details

(To update any Personal Details, click on the 'Manage Personal Details' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.

Note: The date of birth, country of birth, material personal interests and Indigenous status section will not appear in the PDF version of the form and will not be visible to assessors.

Data may be shared with other Commonwealth Entities.

All information contained in Part F is visible to the Administering Organisation on this application.)

Participation Type

Chief Investigator

Title

A/Prof

First Name

David

Middle Name

Family Name

Ubilava

F4. Qualifications

(To update any qualifications, click on the 'Manage Qualifications' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.)

Conferral Date	AQF Level	Degree/Award Title	Discipline/Field	Awarding Organisation	Country of Award
06/08/2010	Doctoral Degree	Doctor of Philosophy	Agricultural Economics	Purdue University	United States of America

F5. Research Load (non-ARC Grants and Research)

(Provide details of research funding from non-ARC sources (in Australia and overseas). For research funding from non-ARC sources, list all projects/applications/awards/fellowships awarded or requests submitted involving that participant for funding for the years 2023 to 2029 inclusive.)

Uploaded PDF file follows on next page.

F5. Research Load (non-ARC Grants and Research)

Funding from Non-ARC Sources

Description (All named investigator s on any application or grant/fellow ship in which a participant is involved, project title, source of support, scheme and round)	Same Research Area (Yes/No)	Support Status (Requested/Current/Past)	Application/ Project ID (for NHMRC applications only)	2023 \$'000	2024 \$'000	2025 \$'000	2026 \$'000	2027 \$'000	2028 \$'000	2029 \$'000
Justin V. Hastings, David Ubilava, David Hammond, "Agricultural shocks and early warning of conflict", National Intelligence and Security Discovery Research Grant, Office of National Intelligence, NI23	Y	R		183	186	212				

F6. What will your time commitment be to research activities related to this project?

(Enter your time commitment to this project as a Full-Time Equivalent (FTE). Note that a FTE of 1.0 represents a full-time commitment (i.e. 5 days per week).)

0.2

F7. Eligibility - Employment Details as at grant commencement date

(This question will be used to determine your eligibility. Your eligibility will be based solely on the information contained in this application. Confirm your employment status at all organisations that you will be associated with as at 1 January 2024. Enter the relevant appointment type and Full-Time Equivalent (FTE) for each organisation.)

Org name	Is this an Eligible Organisation?	Please choose your appointment type for this organisation.	Please enter your FTE for this Organisation
The University of Sydney	Yes	Employee	1.0

F8. Eligibility - Relevant Organisation for this application as at grant commencement date for this project

(Enter the Organisation that is relevant to your participation on this application, and that you will be associated with as at 1 January 2024. The 'relevant organisation' is the primary organisation that will be supporting your involvement in this project if it is funded. Note that the Organisation must be listed in F7 for this question to validate.)

Relevant Organisation

The University of Sydney

F9. Eligibility - Currently held ARC Projects

(This information is auto-populated. If you have any concerns with the information recorded here, please contact your Administering Organisation's Research Office.)

F10. Eligibility - Will the participant reside in Australia for more than 50 per cent of the project activity period?

(This is a 'Yes' or 'No' question. Indicate whether the participant will be residing in Australia for more than 50 per cent of the project activity period. If the participant is applying as a CI and the answer to this question is 'No' they will be prompted to contact their Research Office to check their eligibility.)

Yes

F11. Eligibility - Will the participant undertake a Higher Degree by Research during the project activity period?

(This is a 'Yes' or 'No' question. If the participant is applying as a CI and their answer is 'Yes' to this question they will be prompted to contact their Research Office. Eligibility will be based solely on the information contained in this application.)

No

F12. Eligibility - Project Relinquishment or Application Withdrawal

(ARC grant guidelines specify the limits on the number of applications and projects per named participant. This question will be activated where a participant will exceed ARC project limits at the grant opportunity closing date, if this application is successful. While the application can be submitted, project limits must be met under the grant

guidelines before the project can start. Project limits can be met by relinquishing existing active project(s), or relinquishing role(s) on existing active projects, or withdrawing application(s) that would exceed the project limits. This does not need to occur until all applications are announced.)

F13. Eligibility - Further Details Regarding Partner Investigator Status - Will the participant hold either a remunerated or honorary academic appointment at an Eligible Organisation as at the grant commencement date for this project?

(This is a 'Yes' or 'No' question.
At Question A2 Partner Investigator has been selected as the role type, but it appears that the participant meets the criteria of a Chief Investigator.
NOTE: this question is mandatory ONLY FOR PIs WHO:
• at Question F10 confirmed that they will reside predominantly (greater than 50 per cent of their time) in Australia for the project activity period of the proposed project; AND
• at Question F11 confirmed that they are not currently undertaking a Higher Degree by Research which will be conferred after 1 January 2024; AND
• at Question F7 indicated that at the grant commencement date they would hold either:
- an appointment at an Eligible Organisation equal or greater than 0.2 FTE; OR
- an honorary academic appointment at an Eligible Organisation
If the participant selects 'Yes', they will be further prompted to justify their participation on this application as a PI with reference to the grant guidelines. As part of your justification indicate whether the role is remunerated.
)
Do you hold either a remunerated or an honorary academic appointment at an Eligible Organisation?

Justification of PI status

F14. Is the participant providing research input on this project?

(This is a Yes/No question for Partner Investigators (PI) only. If the PI answers 'Yes', the ROPE questions will be activated. You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section. If the participant answers 'No', they will be asked to upload a 2 page CV to support the PI's involvement in the proposed project. The 2 page CV must be relevant to the application and can include significant career interruptions. It is up to the participant to determine the appropriate information to include in the CV. Please read the Instructions to Applicants for further detail.)

Are you providing research Input?

Research Career - Provide a 2 page CV to support the Partner Investigator's involvement in the proposed project. (Upload a PDF of up to 2 A4 pages)

No PDF file uploaded.

F15. Research Opportunity and Performance Evidence (ROPE) - Current and previous appointment(s) / position(s) - during the past 10 years

(To update any details in this table, click on the 'Manage Employment Details' link in this question. Note this will open in a new browser tab. 'Refresh' the application page when returning to the form to capture changes made to the participant's profile.)

Description	Department	Contract Type	Employment Type	Start Date	End Date	Organisation
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Associate Professor	School of Economics	Permanent	Full Time	01/01/2023		The University of Sydney
Senior Lecturer	School of Economics	Permanent	Full Time	01/01/2017	31/12/2022	The University of Sydney
Lecturer	School of Economics	Permanent	Full Time	01/01/2014	31/12/2016	The University of Sydney
Lecturer	Agricultural and Resource Economics	Permanent	Full Time	01/05/2012	31/12/2013	The University of Sydney

F16. Research Opportunity and Performance Evidence (ROPE) - Career Interruptions

(You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section.)

Has the participant experienced a significant interruption that has impacted on research opportunity?

No

F17. Research Opportunity and Performance Evidence (ROPE) - Details of the participant's career and opportunities for research, evidence of research impact and contributions to the field, including those most relevant to this application

(Provide details of the participant's circumstances and opportunities. This should not include information presented in the following questions (upload a PDF of up to 5 A4 pages).)

Uploaded PDF file follows on next page.

AMOUNT OF TIME AS AN ACTIVE RESEARCHER

I was awarded my PhD 13 years ago in 2010 and in that period, I have experienced no career interruptions.

RESEARCH OPPORTUNITIES

In graduate school, I was awarded the Edmund S. Muskie Graduate Fellowship, which was a program of the Bureau of Educational and Cultural Affairs of the United States Department of State. This highly competitive award, designed for students from post-Soviet countries, allowed me to enrol into, and subsequently complete, the doctorate program in the Department of Agricultural Economics at Purdue University – one of the top programs in the field. During my doctorate studies, I was afforded opportunities to interact with renowned scholars in my area of expertise, which includes my advisory committee and, specifically, my major advisor, and subsequent co-author, Prof Matt Holt.

During 2010-2012 I was employed as a post-doctoral research associate at Mississippi State University. This was a 100% research appointment, with some minor administrative responsibilities. In this role, I was reporting to my advisor, Prof Keith Coble, and also was given an opportunity to interact with a team of collaborators at the United States Department of Agriculture. This interaction allowed me to appreciate the symbiotic relationship between academic sector and governmental policymakers.

Since 2012, I have been employed at the University of Sydney, first as a Lecturer (2012-2016), then as a Senior Lecturer (2017-2022), and most recently as an Associate Professor (2023-present). In all instances, my appointment has been a standard continuing academic staff position (40% teaching, 40% research, and 20% governance, leadership, and engagement). As part of the academic promotions and development program, I have had a benefit of receiving valuable academic advice from the senior colleagues, which revolved around all three dimensions of my appointment, including research.

RESEARCH ACHIEVEMENTS AND CONTRIBUTIONS

Over time, I developed the program of research that advances knowledge by applying state of the art econometric techniques to granular data on markets and prices. More recently, my program branched out into urgent to society topics, such as causes and consequences of conflict and political violence, with specific focus on market disruptions and inefficiencies.

One of the vivid examples of my contribution in advancing of knowledge in the field is my recently accepted article in the American Journal of Agricultural Economics (AJAE), where my co-authors and I propose the seasonal model of agrarian violence and examine this model using over two decades of geographically rich data across Africa. Another example is my 2018 article in the AJAE, where I examine the predictive power of climate shocks, induced by the El Nino Southern Oscillation cycle in a large set of primary commodity prices. To date I have published twenty-three refereed journal articles, including the recent article in the Journal of African Economies that, together with the aforementioned two articles, is of direct relevance to the research question in this application.

My published articles and conference proceedings have been impactful in the scholarly world. My research has been cited more than 850 times, and has led to h-index 15 (as per Google Scholar): both high measures by standards in the field of economics.

The primary outlet of my research dissemination is peer-reviewed academic journals. Of my twenty-three refereed journal articles, majority appear in A* and A category journals (based on ABDC journal ranking list). These include American Journal of Agricultural Economics, Health Economics, and Journal of Economic Behaviour and Organization, all top field journals, as well as other highly regarded journals such as Global Environmental Change, Economics Letters, and Australian Journal of Agricultural and Resource Economics.

I have actively disseminated my research at invited seminar series and conferences within Australia and overseas. I regularly attend and present at the Agricultural and Applied Economics Association (AAEA) meetings in the United States, and at the Australian Agricultural and Resource Economics Society (AARES) meetings in Australia. I have also presented my research at various other conferences and seminar series in different universities around the world.

My research has attracted the interest of national and international media. I have been quoted in well-known outlets, such as The Wall Street Journal, have published, and have provided expert opinion to broader audiences by participating in radio shows (ABC Nightlife) and TV news (CAN News). I have disseminated my work to non-academic community, via commentaries in The Conversation and Vox EU.

I have made contributions to research by enabling the advancement of knowledge through my roles as a journal editor and a referee. Since 2018, I serve as a co-editor of Food Policy – one of the top journals in my field of expertise. Since 2023, I also serve as an associate editor of American Journal of Agricultural Economics – the top field journal. In these roles, I handle more than 80 submissions per year.

I have served as a referee to many leading general interest and field journals, including Journal of Econometrics, American Journal of Agricultural Economics, Climatic Change, and many others. In a calendar year, I generally review up to 20 manuscripts, which is in addition to my editorial duties described above.

I have created opportunities for research to junior colleagues. During my tenure at the University of Sydney, I have supervised two PhD students, a Master of Science student, and nearly twenty Honours students. Two of my Honours students are recipients of the University Medal. I have published peer-reviewed articles co-authored with my PhD student and a former Honours student.

During 2018-2020, I served as a chair-elect and then chair of econometrics section of the Agricultural and Applied Economics Association. In this role I oversaw the section's activities leading to the annual meetings of the Association, which included organizing and coordinating multiple track sessions in different areas of applied econometrics.

In 2014 I served as the president of the NSW branch of the Australian Agricultural and Resource Economics Society.

F18. Research Opportunity and Performance Evidence (ROPE) - Research Output Context

(Research context: Provide clear information that explains the relative importance of different research outputs and expectations in the participant's discipline/s. The information should help assessors understand the context of the participant's academic research achievements but not repeat information already provided in this application. It is helpful to include the importance/esteem of specific journals in their field; specific indicators of recognition within their field such as first authorship/citations, or the significance of non-traditional research outputs. If preprints or comparable resources are cited, these should be explicitly identified in the reference list by including [PREPRINT OR COMPARABLE] after the reference. The reference should include a DOI, URL or equivalent, version number where available and/or date of access, as applicable. If this question is not relevant to a participant, for example a PI with non-academic background, the participant should include a short explanatory statement as to why this question is not applicable (up to 3,750 characters, approximately 500 words).)

My research has been published in leading academic journals within my field as well as in interdisciplinary outlets. Most of my publications appear in A* and A category journals as per the Australian Business Deans Council ranking (2019 ABDC Journal Quality List). The vivid examples of my contribution to advancing the knowledge on the topic of the current project are (i) my forthcoming co-authored publication in the American Journal of Agricultural Economics, where we investigate the seasonality of conflict in the wake of agricultural income shocks, and (ii) my 2022 co-authored publication in the Journal of African Economies where we introduce and test the concept of conflict as the transaction cost in spatial market integration. My other noteworthy publications, which revolve around pressing topics for society are my 2018 solo-authored publication in the American Journal of Agricultural Economics, where I examine the impact of the El Nino Southern Oscillation cycle on the dynamic behavior of a large set of commodity prices, and my 2021 co-authored publication in Heath Economics, where we examine mortality rates across Australia in times of economic downturns over the course of recent history. My other publications, not described here, appear in the top field and interdisciplinary journals such as the Journal of Economic Behavior and Organization, Economics Letters, World Development, and Global Environmental Change.

The publication practices in my field are centered around the quantity of peer-reviewed articles and the quality of journals. Books and book chapters are rare, and not particularly valued—compared to other fields in social sciences—among early and mid-career researchers. The conference participation is appreciated in my field, but this mostly serves the purpose of fine-tuning the research before it is submitted to a journal. Eventually, the key measure of success is derived from peer-reviewed journal publications. The peer-review process in the field of economics is notoriously slow. A successful journal submission usually goes through multiple rounds of review, and it is common to wait multiple months for referee reports in each round of review. This leads to long lags and a relatively modest number of publications, particularly when targeting the A and A* journals (as per ABDC journal rankings). During my tenure at the University of Sydney, I average nearly two publications per year, which is a noteworthy achievement in and of itself that also well exceeds the aspirational standards set by our Faculty.

F19. Research Opportunity and Performance Evidence (ROPE) – Research Outputs Listing including 10 Career-Best Research Outputs

(Provide a list of research outputs marking those that are most relevant to this application categorised under the following headings: 10 career-best research outputs; Authored books; Edited books; Book chapters; Refereed Journal articles; Fully refereed conference proceedings; Additional research outputs (including non-traditional research outputs and preprints or comparable resources). CVs and theses should not be included in this list. The participant's 10 career-best research outputs should not be repeated under subsequent headings (up to 100 research outputs).)

Research Outputs Listing

Generated research output document follows on the next page

Ten Career-Best Research Outputs

- [1] * Hastings, Justin V, Phillips, Sarah G, Ubilava, David & Vasnev, Andrey 2021, 'Price Transmission in Conflict-Affected States: Evidence from Cereal Markets of Somalia', *Journal of African Economies*, vol. 31, no. 3, pp. 272–291, doi:10.1093/jae/ejab012 (Refereed Journal Article)
- [2] * David Ubilava, Justin V. Hastings & Kadir Atalay 2022, 'Agricultural windfalls and the seasonality of political violence in Africa', *American Journal of Agricultural Economics*, doi:10.1111/ajae.12364 (Refereed Journal Article)
- [3] * Shon Ferguson & David Ubilava 2022, 'Global commodity market disruption and the fallout', *Australian Journal of Agricultural and Resource Economics*, doi:10.1111/1467-8489.12497 (Refereed Journal Article)
- [4] * Ubilava, David 2022, 'A comparison of multistep commodity price forecasts using direct and iterated smooth transition autoregressive methods', *Agricultural Economics*, vol. 53, no. 5, pp. 687–701, doi:10.1111/agec.12707 (Refereed Journal Article)
- [5] * Ubilava, D. 2018, 'The role of El Niño Southern Oscillation in commodity price movement and predictability', *American Journal of Agricultural Economics*, vol. 100, no. 1, pp. 239-263 (Refereed Journal Article)
- [6] * Ubilava, D. 2017, 'The ENSO Effect and Asymmetries in Wheat Price Dynamics', *World Development*, vol. 96 (Refereed Journal Article)
- [7] * Smith, S.C. & Ubilava, D. 2017, 'The El Niño Southern Oscillation and economic growth in the developing world', *Global Environmental Change*, vol. 45, pp. 151-164 (Refereed Journal Article)
- [8] * Ubilava, D. & Holt, M. 2013, 'El Niño southern oscillation and its effects on world vegetable oil prices: Assessing asymmetries using smooth transition models', *Australian Journal of Agricultural and Resource Economics*, vol. 57, no. 2, pp. 273-297 (Refereed Journal Article)
- [9] * Ubilava, D. 2012, 'El Niño, La Niña, and world coffee price dynamics', *Agricultural Economics*, vol. 43, no. 1, pp. 17-26 (Refereed Journal Article)
- [10] Kadir Atalay, Rebecca Edwards, Stefanie Schurer & David Ubilava 2021, 'Lives saved during economic downturns: Evidence from Australia', *Health Economics*, doi:10.1002/hec.4394 (Refereed Journal Article)

Refereed Journal Articles

- [1] Simon D. Angus, Kadir Atalay, Jonathan Newton & David Ubilava 2021, 'Geographic diversity in economic publishing', *Journal of Economic Behavior & Organization*, vol. 190, pp. 255–262, doi:10.1016/j.jebo.2021.08.005
- [2] * David Ubilava & Maryam Abdolrahimi 2019, 'The El Niño impact on maize yields is amplified in lower income teleconnected countries', *Environmental Research Letters*, vol. 14, no. 5, pp. 054008, doi:10.1088/1748-9326/ab0cd0
- [3] Ubilava, D. 2019, 'On the relationship between financial instability and economic performance: Stressing the business of nonlinear modeling', *Macroeconomic Dynamics*, vol. 23, no. 1, pp. 80-100
- [4] Ubilava, D., Villoria, N.B. & Tack, J.B. 2019, 'Smooth transitions across latitudes and longitudes: An application of a nonlinear panel regression to the climate?economics nexus', *Economics Letters*, vol. 182, pp. 114-117
- [5] Tack, J.B. & Ubilava, D. 2015, 'Climate and agricultural risk: Measuring the effect of ENSO on U.S. crop insurance', *Agricultural Economics (United Kingdom)*, vol. 46, no. 2, pp. 245-257
- [6] Ubilava, D. 2014, 'El Niño Southern Oscillation and the fishmeal-soya bean meal price ratio: Regime-dependent dynamics revisited', *European Review of Agricultural Economics*, vol. 41, no. 4, pp. 583-604
- [7] * Ubilava, D. & Helmers, C.G. 2013, 'Forecasting ENSO with a smooth transition autoregressive model', *Environmental Modelling and Software*, vol. 40, pp. 181-190
- [8] Tack, J.B. & Ubilava, D. 2013, 'The effect of El Niño Southern Oscillation on U.S. corn production and downside risk', *Climatic Change*, vol. 121, no. 4, pp. 689-700
- [9] Ubilava, D. 2012, 'Modeling Nonlinearities in the U.S. Soybean-to-Corn Price Ratio: A Smooth Transition Autoregression Approach', *Agribusiness*, vol. 28, no. 1, pp. 29-41
- [10] Ubilava, D., Foster, K.A., Lusk, J.L. & Nilsson, T. 2011, 'Differences in consumer preferences when facing branded versus non-branded choices', *Journal of Consumer Behaviour*, vol. 10, no. 2, pp. 61-70

- [11] Ubilava, D., Barnett, B.J., Coble, K.H. & Harri, A. 2011, 'The SURE program and its interaction with other federal farm programs', *Journal of Agricultural and Resource Economics*, vol. 36, no. 3, pp. 630-648
- [12] Ubilava, D., Foster, K.A., Lusk, J.L. & Nilsson, T. 2010, 'Effects of income and social awareness on consumer WTP for social product attributes', *Technological Forecasting and Social Change*, vol. 77, no. 4, pp. 587-593
- [13] Ubilava, D. & Foster, K. 2009, 'Quality certification vs. product traceability: Consumer preferences for informational attributes of pork in Georgia', *Food Policy*, vol. 34, no. 3, pp. 305-310

F20. Is the participant applying for Teaching Relief?

*(This is a 'Yes' or 'No' question.
(This question must be answered if the participant is a Chief Investigator)
• If you select 'Yes' you will be prompted to request the percentage of Teaching Relief for each requested year (25, 50, 75 or 100 per cent).
• The percentage of Teaching Relief will be automatically calculated and the request will be generated in Question E1.
• Note: CIs may request funding for teaching relief in order to maximise the opportunity for the CI to conduct research. This question is only relevant for CIs and will not be activated for PIs.)*

Yes				
Year 1	Year 2	Year 3	Year 4	Year 5
0%	50%	0%	0%	0%

Part F - Participant Details including ROPE (Prof Justin Hastings)

F1. Personal Details

(To update any Personal Details, click on the 'Manage Personal Details' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.

Note: The date of birth, country of birth, material personal interests and Indigenous status section will not appear in the PDF version of the form and will not be visible to assessors.

Data may be shared with other Commonwealth Entities.

All information contained in Part F is visible to the Administering Organisation on this application.)

Participation Type

Chief Investigator

Title

Prof

First Name

Justin

Middle Name

Van Overloop

Family Name

Hastings

F4. Qualifications

(To update any qualifications, click on the 'Manage Qualifications' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.)

Conferral Date	AQF Level	Degree/Award Title	Discipline/Field	Awarding Organisation	Country of Award
24/05/2008	Doctoral Degree	PhD	Political Science	University of California, Berkeley	United States of America
24/05/2003	Masters Degree	MA	Political Science	University of California, Berkeley	United States of America
01/06/2001	Bachelor Degree	AB	Public and International Affairs	Princeton University	United States of America

F5. Research Load (non-ARC Grants and Research)

(Provide details of research funding from non-ARC sources (in Australia and overseas). For research funding from non-ARC sources, list all projects/applications/awards/fellowships awarded or requests submitted involving that participant for funding for the years 2023 to 2029 inclusive.)

Uploaded PDF file follows on next page.

F5. Research Load (non-ARC Grants and Research)

Description (All named investigators on any application or grant/fellowship in which a participant is involved, project title, source of support, scheme and round)	Same Research Area (Yes/No)	Support Status (Requested/Current/Past)	App. Proj. ID (for NHM RC applications only)	2023 \$'000	2024 \$'000	2025 \$'000	2026 \$'000	2027 \$'000	2028 \$'000	2029 \$'000
Justin V. Hastings, David Ubilava, David Hammond, "Agricultural shocks and early warning of conflict", National Intelligence and Security Discovery Research Grant, Office of National Intelligence, NI23	Y	R		183	186	212				
Justin V. Hastings, Aim Sinpeng, Kanchana Thilakarathna, Roger Huang, "Network shocks and fertile grounds for adversary influence operations", National Intelligence and Security Discovery Research Grant, Office of National Intelligence, NI23	N	R		156	275	109				
Center for Korean Women and Politics (main recipient entity, contracted to Justin V. Hastings, Andrew Yeo), "Informing programming through field research on North Korean market activities", National Endowment for Democracy, 2022 grant round	N	C		72						
Aim Sinpeng, Justin V. Hastings, Mark Manantan, "Game4Change: Countering China's Influence Operations in Southeast Asia", US State Department Global Engagement Center grant, 2023 round	N	R		357	357					

F6. What will your time commitment be to research activities related to this project?

(Enter your time commitment to this project as a Full-Time Equivalent (FTE). Note that a FTE of 1.0 represents a full-time commitment (i.e. 5 days per week).)

0.2

F7. Eligibility - Employment Details as at grant commencement date

(This question will be used to determine your eligibility. Your eligibility will be based solely on the information contained in this application. Confirm your employment status at all organisations that you will be associated with as at 1 January 2024. Enter the relevant appointment type and Full-Time Equivalent (FTE) for each organisation.)

Org name	Is this an Eligible Organisation?	Please choose your appointment type for this organisation.	Please enter your FTE for this Organisation
The University of Sydney	Yes	Employee	1.0

F8. Eligibility - Relevant Organisation for this application as at grant commencement date for this project

(Enter the Organisation that is relevant to your participation on this application, and that you will be associated with as at 1 January 2024. The 'relevant organisation' is the primary organisation that will be supporting your involvement in this project if it is funded. Note that the Organisation must be listed in F7 for this question to validate.)

Relevant Organisation

The University of Sydney

F9. Eligibility - Currently held ARC Projects

(This information is auto-populated. If you have any concerns with the information recorded here, please contact your Administering Organisation's Research Office.)

Identifier	Investigators	Admin Organisation	Project Title	Funding	End Date	Final Report Due Date	Final Report Status
FT160100235	Prof Justin Hastings	The University of Sydney	Illicit networks and emerging nuclear states	\$762,000	21/12/2022	21/12/2023	Draft

F10. Eligibility - Will the participant reside in Australia for more than 50 per cent of the project activity period?

(This is a 'Yes' or 'No' question. Indicate whether the participant will be residing in Australia for more than 50 per cent of the project activity period. If the participant is applying as a CI and the answer to this question is 'No' they will be prompted to contact their Research Office to check their eligibility.)

Yes

F11. Eligibility - Will the participant undertake a Higher Degree by Research during the project activity period?

(This is a 'Yes' or 'No' question. If the participant is applying as a CI and their answer is 'Yes' to this question they will be prompted to contact their Research Office. Eligibility will be based solely on the information contained in this application.)

No

F12. Eligibility - Project Relinquishment or Application Withdrawal

(ARC grant guidelines specify the limits on the number of applications and projects per named participant. This question will be activated where a participant will exceed ARC project limits at the grant opportunity closing date, if this application is successful. While the application can be submitted, project limits must be met under the grant guidelines before the project can start. Project limits can be met by relinquishing existing active project(s), or relinquishing role(s) on existing active projects, or withdrawing application(s) that would exceed the project limits. This does not need to occur until all applications are announced.)

F13. Eligibility - Further Details Regarding Partner Investigator Status - Will the participant hold either a remunerated or honorary academic appointment at an Eligible Organisation as at the grant commencement date for this project?

(This is a 'Yes' or 'No' question.

At Question A2 Partner Investigator has been selected as the role type, but it appears that the participant meets the criteria of a Chief Investigator.

NOTE: this question is mandatory ONLY FOR PIs WHO:

- *at Question F10 confirmed that they will reside predominantly (greater than 50 per cent of their time) in Australia for the project activity period of the proposed project; AND*
- *at Question F11 confirmed that they are not currently undertaking a Higher Degree by Research which will be conferred after 1 January 2024; AND*
- *at Question F7 indicated that at the grant commencement date they would hold either:*
 - *an appointment at an Eligible Organisation equal or greater than 0.2 FTE; OR*
 - *an honorary academic appointment at an Eligible Organisation*

If the participant selects 'Yes', they will be further prompted to justify their participation on this application as a PI with reference to the grant guidelines. As part of your justification indicate whether the role is remunerated.

)

Do you hold either a remunerated or an honorary academic appointment at an Eligible Organisation?

Justification of PI status

F14. Is the participant providing research input on this project?

(This is a Yes/No question for Partner Investigators (PI) only. If the PI answers 'Yes', the ROPE questions will be activated. You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section. If the participant answers 'No', they will be asked to upload a 2 page CV to support the PI's involvement in the proposed project. The 2 page CV must be relevant to the application and can include significant career interruptions. It is up to the participant to determine the appropriate information to include in the CV. Please read the Instructions to Applicants for further detail.)

Are you providing research Input?

Research Career - Provide a 2 page CV to support the Partner Investigator's involvement in the proposed project. (Upload a PDF of up to 2 A4 pages)

No PDF file uploaded.

F15. Research Opportunity and Performance Evidence (ROPE) - Current and previous appointment(s) / position(s) - during the past 10 years

(To update any details in this table, click on the 'Manage Employment Details' link in this question. Note this will open in a new browser tab. 'Refresh' the application page when returning to the form to capture changes made to the participant's profile.)

Description	Department	Contract Type	Employment Type	Start Date	End Date	Organisation
Professor of International Relations and Comparative Politics	Government and International Relations	Permanent	Full Time	07/06/2019		The University of Sydney
Associate Professor in International Relations and Comparative Politics	Government and International Relations	Permanent	Full Time	01/01/2017	06/06/2019	The University of Sydney
Senior Lecturer in International Relations and Comparative Politics	Government and International Relations	Permanent	Full Time	01/01/2013	31/12/2016	The University of Sydney

F16. Research Opportunity and Performance Evidence (ROPE) - Career Interruptions

(You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section.)

Has the participant experienced a significant interruption that has impacted on research opportunity?

Yes

From when

17/12/2017

To when

31/01/2018

FTE of academic interruption

1.0

Interruption Category

Caring and parental responsibilities

Details

Partner and personal leave associated with the birth of my second son.

From when

16/07/2018

To when

16/12/2018

FTE of academic interruption

1.0

Interruption Category

Caring and parental responsibilities

Details

Primary caregiver leave to take care of both of my sons.

From when

13/03/2015

To when

30/04/2015

FTE of academic interruption

1.0

Interruption Category

Caring and parental responsibilities

Details

Partner and personal leave associated with the birth of my first son.

F17. Research Opportunity and Performance Evidence (ROPE) - Details of the participant's career and opportunities for research, evidence of research impact and contributions to the field, including those most relevant to this application

(Provide details of the participant's circumstances and opportunities. This should not include information presented in the following questions (upload a PDF of up to 5 A4 pages).)

Uploaded PDF file follows on next page.

F17 Research Opportunity and Performance Evidence

AMOUNT OF TIME AS AN ACTIVE RESEARCHER

It has been nearly 15 years since I received my PhD (from the University of California, Berkeley, in May 2008), during which time I have had 44 weeks of academic career interruptions: 32 weeks (0.6 years at 1.0 FTE) due to primary carer's leave and child care responsibilities, and 12 weeks at 1.0 FTE due to moving from the United States to Australia in January 2011. I have been in full-time tenure-track or continuing academic positions since August 2008, with one country change.

RESEARCH OPPORTUNITIES

In graduate school, I received a National Science Foundation IGERT Public Policy and Nuclear Threats fellowship through the University of California, which including training and funding for graduate school. I subsequently received a month of full-time training in nuclear security issues (including the science of nuclear weapons and reactors, non-proliferation and counter-proliferation policy, and nuclear weapons strategy and doctrine), and worked for a semester as a student researcher at Lawrence Livermore National Laboratory's Center for Global Security Research on nuclear non-proliferation issues. Without a postdoc, I did not have any formal research mentoring after graduate school, although I participate in the University of Sydney's Academic Planning and Development program, which provides career mentoring, and have informal mentors within the department. My studies and employment at the University of California, Berkeley; the Georgia Institute of Technology; and the University of Sydney have provided access to academic libraries and small internal grants to support some research and occasional conference attendance.

From August 2008 to December 2010, I was employed full-time as an assistant professor of international affairs at the Georgia Institute of Technology in the United States. During my time at Georgia Tech, the usual teaching load was four units per year (equaling 180 contact hours per year). The time I was assumed to be spending on different activities was equal to 40% research, 40% teaching, and 20% service and administration.

At the University of Sydney, from January 2011 to June 2017 my position was a standard continuing academic staff position, which means a combination of teaching (no more than 208 contact hours per year), research, and administration/advising. The time I was assumed to be spending on different activities within my position was estimated at 40% teaching, 40% research, and 20% service. From June 2017 to December 2022, with the exception of February 2018 to January 2019, when my Future Fellowship was suspended in order for me to take another grant as well as primary caregiver's leave for my second son, and January 2022 to June 2022, when my Future Fellowship was suspended due to Covid restrictions and impacts, I was on a Future Fellowship, with an 80% research, 20% teaching and service breakdown.

RESEARCH ACHIEVEMENTS AND CONTRIBUTIONS

This proposal's field can broadly be understood as the study of the relationship between agriculture, conflict, and institutions in fragile or marginalised states. This is a field that is largely situated within political science and economics. I have already made extensive contributions to the study of conflict and violent actors in marginalised states by looking at the relationship between physical, economic, and political geography and the structure and behaviour of both states at the margins of the international system and illicit non-state actors such as terrorist groups, pirate syndicates, nuclear proliferation networks, and smuggling outfits.

I have been building my contributions for a number of years. My book *No Man's Land* (Cornell University Press, 2010), serves as a counterpoint to claims that globalization has empowered clandestine networks such as organized criminals and transnational terrorist groups relative to states. In the book I show exactly how and when clandestine networks' ability to make use of modern communications and transportation technology is constrained both by state hostility and the spatial configurations of legitimate transportation and economic infrastructure. The book thus breaks new ground in providing academics and policymakers with a single theoretical framework for probing the weaknesses of a wide variety of illicit actors, including terrorists, insurgents, pirates, and smugglers.

I followed this up with *A Most Enterprising Country* (Cornell University Press, 2016), applied a qualitative globalized economic networks framework to look at the surprising success of North Korean trade networks as an

avenue into understanding how politically peripheral actors might access and benefit from the global economy in ways not contained within traditional understandings of international security or international political economy. I explore the seeming puzzle at the heart of how many observers think about North Korea: the most politically isolated state in the world nonetheless sustains itself in large part by international trade and integration into the global economy, albeit of a quality that would be unrecognizable to many other states in the international system. The transnational trade networks that criss-cross the region, and sustain the regional economy by producing, distributing, and selling goods, labour, and information, have been accessed in a number of ways by the North Korean state, and North Koreans in general. They are highly risk-acceptant, and have become experts at operating in the blurred zones between licit and illicit, or between formal and informal trade, at least as defined by the outside world. Writes one of the reviewers for my successful DP14 proposal that led to *A Most Enterprising Country*, “It is a fascinating topic that has a high level of both scholarly and policy significance. It has an interesting theoretical take, and has an extremely innovative strategy for gathering evidence...The study of illicit flows is too often marred by sensationalism and a total lack of any theory or method, often substituted for by a pandering to the interests of various national security and policing constituencies. Happily, the proposal avoids all these pit-falls.”

My work on North Korea since then has made a substantial contribution to understanding informal institutions and markets in fragile states. My articles in *Journal of East Asian Studies* and in *Asian Survey* with Yaohui Wang showed that North Korea’s formal institutions were so dysfunctional that market participants engaged in smuggling of even legitimate goods to decrease uncertainty and ensure market stability. They also pursued a number of strategies to manage policy uncertainty and enforce agreements in the face of formal institutional dysfunction, which effectively led to informal institutions in China and North Korea supporting market activities. These strategies, as I point out in my US National Committee on North Korea report with Andrew Yeo and Daniel Wertz, include building trust networks to mitigate and resolve disputes, encouraging reciprocity, and accessing information in the face of repression, all of which may form the building blocks of civil society in North Korea.

With my co-authors, I have also conceptually and empirically connected violent activities – particularly maritime piracy -- to various factors, including market activities and informal institutions, in fragile states. As I show using both quantitative analysis and qualitative case studies in my articles in *Political Geography*, *Security Studies*, and *Pacific Affairs*, sophisticated piracy operations are constrained by political and economic infrastructure and institutions. Fragile states in particular have sufficiently poor economic infrastructure that they force piracy syndicates into the types of piracy operations that do not require the extensive use of markets or formal economic institutions, but do require access to informal political institutions that give pirates the time and political cover to operate. At the same time, to conduct other types of sophisticated piracy operations *does* require links to international (or at least extensive) markets.

I built on this foundation with a series of co-authored high-impact articles that linked Somali piracy, markets, and informal institutions. In our quantitative article in *International Studies Quarterly*, we showed that Somali piracy actually has a negative effect on Somalia’s markets, inasmuch as piracy ransoms lead to Dutch Disease-like effects in food markets throughout Somalia. In our article in *African Affairs*, we charted a new way of understanding institutions and maritime pirates by thinking of them as business networks that are constrained by both formal and informal economic institutions. Even though pirates are illicit actors, they still must play by the rules of the game, which are often more effectively through informal understandings than by formal institutions. These informal understandings can be quite powerful. In the *Journal of Modern African Studies*, we showed that different regions of Somalia were able to rely on informal institutions – in this case, elite unity and norms against piracy – to keep pirates out of their regions, even though they lacked formal coercive institutions.

Finally, I moved more directly into the question of agricultural shocks and conflict with a co-authored article in *Journal of African Economies*, in which we find that, in the case of Somalia, conflict tends to slow the speed of price transmission among markets across Somalia for imported food commodities, while conflict has no such effect for locally produced food, suggesting that the effect of violence on agricultural prices even in conflict-affected states is not homogeneous. Furthermore, we find that, even in conflict-affected areas of Somalia, there is some price transmission, which points the possibilities of informal institutions that can bridge the divides created by conflict, distance, and internal political fragmentation.

More recently, our article in *American Journal of Agricultural Economics* has shed light on seasonality of agricultural shocks and conflict, finding that there is an increase in attacks on civilians during harvest seasons in crop-producing areas of Africa. This is in part related to the way in which state institutions are set up, and in which they operate: the seasonality is driven by political militias, who often act as proxies for states in their short-term, intensive campaigns to deprive elites' adversaries of resources and harm their adversaries' supporters. State fragmentation, in other words, can be a driver of agricultural-related conflict.

Quality and innovation in research

As part of my contribution to the study of conflict and fragile states, I have published two books with Cornell University Press: *No Man's Land: Globalization, Territory, and Clandestine Groups in Southeast Asia* in 2010, and *A Most Enterprising Country: North Korea in the Global Economy*, in 2016. Cornell is arguably the top university press in the world for Asian politics and international relations (particularly security studies and international political economy). It was rated the number four press overall for international relations in the 2011 TRiP survey, the primary global survey of international relations specialists. *No Man's Land* was a Finalist for the Asia Society's 2011 Bernard Schwartz Book Award, meaning that an international jury of experts selected it as one of the top five books in Asian Studies published worldwide in 2010. Unusually for a first book from a university press, due to anticipated demand, the book was released simultaneously in paperback and hardcover, and before publication was also licensed to NUS Press, Singapore, which began distributing it in Asia and Oceania in April 2011.

No Man's Land has been reviewed positively in *Contemporary Southeast Asia*, *Perspectives on Politics*, *Singapore Journal of Tropical Geography*, *Terrorism and Political Violence*, and *International Studies Review*. Writing in *Contemporary Southeast Asia* (April 2011, vol. 33, no. 1, pp. 143-146), Kumar Ramakrishna commented that *No Man's Land* "...offers a long-overdue and much more nuanced analysis of the relationship between globalization and the so-called Clandestine Transnational Organizations (CTOs)...In the final analysis, *No Man's Land* is an original, accessible and useful read, and a welcome addition to the burgeoning literature on terrorism and transnational crime in Southeast Asia and beyond." My most recent book, *A Most Enterprising Country*, is poised to be similarly innovative. According to one of the reviewers, "This is a solid and engaging study of North Korean trading networks that should be an important addition to the growing body of work on contemporary North Korean society and economy...The author convincingly argues that North Korea is in fact deeply involved in a variety of trade networks ranging from large-scale state-sponsored exports to small-scale individual merchants."

I have published articles in a wide variety of international journals in geography, area studies, and political science, including *Political Geography*, *Security Studies* (twice), *African Affairs*, *International Studies Quarterly*, *Review of International Political Economy*, *Third World Quarterly*, *Marine Policy*, *Journal of African Economies*, and *China Quarterly*, all of which were rated as A or A*-level journals under the 2016 Australian Political Studies Association ERA journal rankings or the Australian Business Deans Council (ABDC) journal rankings. In addition, as of October 2022, my most popular article, "Geographies of State Failure and Sophistication in Maritime Piracy Hijackings" in *Political Geography*, has been cited more than 230 times (according to Google Scholar) since its publication in May 2009, while eleven other books and articles have been cited at least 20 times. I have over 810 citations, and an h-index of 14. The quality of my research outputs has not gone unnoticed, and I have parlayed them into eleven major external grants and contracts totaling approximately \$2.5 million since 2013, including three from the ARC, two from the MacArthur Foundation in the United States, one from the US Department of Defense, one from the Australian Defence Department, one from the Korea Foundation in South Korea, and two research contracts from the US National Endowment for Democracy. In the words of one of the assessors for my successful Future Fellowship application:

"His research record to date indicates a consistent ability to place his research in top quality outlets, including two books with Cornell University Press (an outstanding achievement by itself for a scholar still relatively early in his career). Dr Hastings' publication record also indicates a coherent and cumulative research program, combining scholarly rigour with a focus on issues of urgent policy concern. Dr Hastings has also demonstrated in his career to date a serious and sustained commitment to reaching out to relevant stakeholders beyond academia to disseminate policy-relevant research findings. This is a particularly relevant consideration when assessing this proposal, the value of which hinges importantly in the potential knowledge transfer from academia to government and industry stakeholders. Finally, Dr Hastings has not

only demonstrated a strong capacity to attract research funding to date, but - most importantly – a capacity to translate this research support."

Evidence of national and international research standing

My research trajectory has enabled me to build an international reputation and to make an impact on policy in North America, Europe, and Asia, via consultancies and policy advice for governments, multinational corporations, and non-profit organisations, and to the general public via appearances in media around the world:

Consultancies and policy advice – In the past twenty years, because I am a recognized international expert on illicit and gray market networks, I have provided consulting expertise, primarily on East Asia, black and gray markets, terrorism, nuclear proliferation, and political risk, for various organizations, including in the United States, Northeast Asia, and Southeast Asia. In the process, I have built up extensive experience dealing with governments in addressing security and intelligence challenges.

In 2006, I presented my research on Southeast Asian terrorist organizations to Singapore's external intelligence agency. In 2007 and 2008, I consulted for the Combating Terrorism Centre (CTC) at the US Military Academy, first as an analyst of terrorism-related primary source documents, then as author of the chapter on Jemaah Islamiyah (JI) for the FBI's counterterrorism training manual. In 2010, I also served as a subject matter expert on JI to various US government agencies interested in innovation in terrorist and criminal organizations. In 2012 and 2013, I served as a consultant to NGOs and businesses in East Asia seeking to assess their exposure to political, economic, and security risk. In 2014, I provided solicited advice to representatives from the Australian Office of National Assessments, and the US State Department on North Korea's economic and political situation. In 2015, I was engaged by CSIS Pacific Forum (with funding from the US State Department) to provide training on nuclear proliferation networks and strategic trade controls to Myanmar government officials (before the coup), and briefed International Atomic Energy Agency officials and General Electric trade compliance officers on nuclear proliferation networks as well.

More recently, in 2016, I served as a consultant to the North Korea Strategy Center on a project on North Korean drug trafficking and human rights. In 2017 and 2018, I presented briefings on nuclear proliferation networks to the United Arab Emirates' Federal Authority for Nuclear Regulation in Dubai. In 2018, I also briefed the Jordan Atomic Energy Commission on nuclear proliferation networks. In 2019, I provided invited policy advice to Public Safety Canada on counterproliferation efforts, and was an invited speaker to the Australian Department of Foreign Affairs and Trade's North Asian Division G8+ meeting on enforcing North Korean sanctions.

In 2020, I served as a consultant to the United Nations Global Maritime Crime Program for a project on weapons of mass destruction and maritime security, to the US National Endowment for Democracy (through the US National Committee on North Korea and the South Korean Center for Korean Women and Politics) for a project on North Korean markets and civil society development, and to the International Atomic Energy Agency for a project on mapping nuclear trade networks in East. I was sponsored for the consultancy with the IAEA by the Australian Support Programme to the Department of Safeguards (one of the few social scientists to be so sponsored), and my work with the IAEA is a part of my engagement plan for my Future Fellowship. In 2022, in the wake of North Korea's Covid-19 outbreak, I also provided my solicited expert opinion to the US Intelligence Community on the effects of Covid on North Korea's economy.

National and international media appearances – As an internationally recognized expert in international relations, terrorism, security issues, nuclear weapons, and Asian politics, I am widely sought after in the media and, since I arrived in Australia in January 2011, I have given approximately 160 interviews to a wide variety of radio, television, and print outlets in Singapore, Australia, Brazil, New Zealand, Indonesia, Cambodia, Hong Kong, the United States, the United Kingdom, China, Turkey, and Qatar. Media outlets include TODAY, Channel NewsAsia, SBS News, ABC 7:30 Report, SkyNews, news.com.au, *O Estado de S. Paulo*, cnc.com, ABC News 24, News Corporation, Radio New Zealand, *Canberra Times*, Jakarta Globe, CNN International, thinkprogress.com, RT World 24, BBC Today, ABC World Today, thepaper.cn, Turkish Radio and Television, Newsday, BBC World Service, *The Guardian*, Today Show (Channel Nine), Seven News, Mike Hosking Breakfast, Agence France Presse, Al Jazeera, John Laws Show, Reuters, Bloomberg News, *Vice*, *People's Daily*, China Radio International, *Straits Times*, *Southeast Asia Globe*, ABC 702 Drive, Alan Jones Show, Ten News, Laurie Atlas Show, ABC Kids, and Phoenix Satellite Television.

My international standing has also been recognized academically with a number of international fellowships, invited presentations globally, and invitations to serve as a reviewer for academic journals, presses, and research foundations:

International fellowships - I have been a recipient of a number of prestigious international competitive fellowships. As a PhD student from 2002 to 2008, I was a Boren Graduate Fellow, funded by the United States government to conduct national security-relevant research using Indonesian language sources in Singapore, Malaysia, and Indonesia, and received a Foreign Language and Area Studies Fellowship to study Chinese. From 2004 to 2006, I was also a Public Policy and Nuclear Threats Fellow, part of a program funded by the US National Science Foundation to create the United States' next generation of nuclear weapons and energy experts in academia and policymaking circles. Since I received my PhD in 2008, I have received a Sumitro Fellowship with the United States-Indonesia Society, given to one US researcher annually for research on Indonesian political economy; and a National Asia Research Program Research Fellowship, given to the top eleven young Asian politics and economics researchers in the United States. In 2014, I also received a competitive POSCO Visiting Fellowship at the East-West Center in Honolulu, where I was funded to conduct research and write on North Korea.

National and international invited presentations - I have given a number of invited international presentations on my research, including at the Salzburg Global Seminar and the Vienna Center for Disarmament and Nonproliferation in Austria, the University of Michigan, the University of California, San Diego, the National Bureau of Asia Research, Georgia Tech, the East-West Center, and Stanford University in the United States, Atma Jaya University and the University of Indonesia in Indonesia, South Korea's KAIST (seven times) and Seoul National University, the University of Macau, the ISEAS-Yusuf Ishak Institute, Singapore's Rajaratnam School of International Studies, the Carnegie Endowment for International Peace, the US National Committee on North Korea, the Nuclear Energy Experts Group of CSCAP, the Korean Institute for Nuclear Nonproliferation and Control (KINAC), the US Department of State, the US Defense Threats Reduction Agency, KPMG, and the Lausanne Movement.

Peer Reviewing - Primarily due to my international reputation across several disciplines, I have served as an invited peer reviewer for a large number of international journals and presses in political science, international relations, geography, criminology, public policy, and Asian and African area studies, including *Problems of Post-Communism*, *International Studies Quarterly*, *Terrorism and Political Violence*, *Journal of Conflict Resolution*, *American Journal of Political Science*, *Journal of Peace Research*, *Transactions of the Institute of British Geographers*, *Millennium*, *China Quarterly*, *Disaster*, *British Journal of Political Science*, *Australian Journal of International Affairs*, *Asian Security*, *International Interactions*, *International Studies Review*, *Crime, Law, and Social Change*, Princeton University Press, Oxford University Press, Rowman & Littlefield, and Palgrave MacMillan. I have also served as an expert assessor for the African Academy of Sciences, the Australian Research Council (LP, DP, FT, DECRA)), US Department of Homeland Security, the Indonesian Science Fund, the Netherlands Organisation for Scientific Research, the Southern African Society for Disaster Reduction, and the Korea Research Foundation.

F18. Research Opportunity and Performance Evidence (ROPE) - Research Output Context

(Research context: Provide clear information that explains the relative importance of different research outputs and expectations in the participant's discipline/s. The information should help assessors understand the context of the participant's academic research achievements but not repeat information already provided in this application. It is helpful to include the importance/esteem of specific journals in their field; specific indicators of recognition within their field such as first authorship/citations, or the significance of non-traditional research outputs. If preprints or comparable resources are cited, these should be explicitly identified in the reference list by including [PREPRINT OR COMPARABLE] after the reference. The reference should include a DOI, URL or equivalent, version number where available and/or date of access, as applicable. If this question is not relevant to a participant, for example a PI with non-academic background, the participant should include a short explanatory statement as to why this question is not applicable (up to 3,750 characters, approximately 500 words).)

Political science is generally a mixed book and article field, with the preference in terms of type of research output dependent to a certain extent on the type of research methods used, and the topics covered. Since I do both quantitative and qualitative research in both international relations and comparative politics, I would be expected to write (and do write) both books and articles. The impact/prestige of political science/international relations journal articles is measured by impact factor (the highest impact non-methodology journal in political science has an impact factor of around 3), and by the Australian Political Studies Association (APSA) journal ranking. Of the 29 journal articles I have published, 17 have been in A or A* journals, according to the 2016 APSA journal ranking and/or the Australian Business Deans Council (ADBC) ranking. The TRIP survey is used to rank book presses in international relations. Both of my books were published by Cornell University Press, which is one of the Big Four presses in international relations (along with Princeton, Oxford, and Cambridge), and was ranked as no. 4 in the 2011 TRIP survey. My first book was a finalist for the Bernard Schwartz Book Prize, ranking it among the top five books in Asian politics published in 2010 in the world. My 2015 African Affairs article with Sarah Phillips was awarded the 2016 Stephen Ellis Prize by the British African Studies Association, for being the most innovative article in African Affairs in the previous two years. My article in Pacific Affairs was a runner-up for the award for best article in Pacific Affairs for that year (2020).

There is a clear trend in political science research (particularly quantitative research) toward co-authoring, but there is no strong authorship order norm in political science: authorship order can be either by level of contribution, or alphabetical, depending on the authors' preference. For conference papers in political science, participants submit abstracts and are expected to present full written papers at conferences (usually with discussant commentary), but the conference papers are not formally refereed as such. Conference papers are thus a sign of continued engagement with academic community, but are not publications in and of themselves. Book chapters count as publications, but are not given the same weight as peer-reviewed journal articles or books.

Political science counts citations, but is a relatively low-citation field: many international relations full professors have fewer than 100 citations. My current citation count of over 800, with an h-index of 15, is significantly above the norm.

For security studies-oriented international relations academics, policy impact is prized, and non-traditional research outputs such as policy briefs and analytical reports for think tanks and governments are viewed positively. As such, my major reports for the MacArthur Foundation, the US Defense Threat Reduction Agency, the United Nations Global Maritime Crime Program, the US National Endowment for Democracy, and the International Atomic Energy Agency are significant contributions.

F19. Research Opportunity and Performance Evidence (ROPE) – Research Outputs Listing including 10 Career-Best Research Outputs

(Provide a list of research outputs marking those that are most relevant to this application categorised under the following headings: 10 career-best research outputs; Authored books; Edited books; Book chapters; Refereed Journal articles; Fully refereed conference proceedings; Additional research outputs (including non-traditional research outputs and preprints or comparable resources). CVs and theses should not be included in this list. The participant's 10 career-best research outputs should not be repeated under subsequent headings (up to 100 research outputs).)

Research Outputs Listing

Generated research output document follows on the next page

Ten Career-Best Research Outputs

- [1] Hastings, Justin 2010, 'No Man's Land: Globalization, territory, and clandestine groups in Southeast Asia', Cornell University Press (Authored Book)
- [2] Hastings, Justin V 2016, 'A most enterprising country: North Korea in the global economy', Cornell University Press, DP140102098 (2014-2019) (Authored Book)
- [3] Hastings, Justin V 2009, 'Geographies of state failure and sophistication in maritime piracy hijackings', *Political Geography*, vol. 28, no. 4, pp. 213–223 (Refereed Journal Article)
- [4] * Oliver, Steven, Jablonski, Ryan & Hastings, Justin V 2017, 'The Tortuga disease: the perverse effects of illicit foreign capital', *International Studies Quarterly*, vol. 61, no. 2, pp. 312–327, DP130103966 (2013-2016) (Refereed Journal Article)
- [5] Hastings, Justin V 2012, 'Understanding maritime piracy syndicate operations', *Security Studies*, vol. 21, no. 4, pp. 683–721 (Refereed Journal Article)
- [6] * Ubilava, David, Hastings, Justin & Atalay, Kadir 2022, 'Agricultural windfalls and the seasonality of political violence in Africa', *American Journal of Agricultural Economics*, pp. 1-24 (Refereed Journal Article)
- [7] * Ubilava, David, Hastings, Justin, Phillips, Sarah & Vasnev, Andrey 2022, 'Price transmission in conflict-affected states: Evidence from cereal markets in Somalia', *Journal of African Economies*, vol. 31, no. 3, pp. 272-291 (Refereed Journal Article)
- [8] Hastings, Justin V 2015, 'The economic geography of North Korean drug trafficking networks', *Review of International Political Economy*, vol. 22, no. 1, pp. 162–193 (Refereed Journal Article)
- [9] * Hastings, Justin & Song, Annie 2022, 'The maritime security fallout from North Korea's fisheries policy', *Marine Policy*, DP140102098 (2014-2019) (Refereed Journal Article)
- [10] * Hastings, Justin V & Phillips, Sarah G 2015, 'Maritime piracy business networks and institutions in Africa', *African Affairs*, vol. 114, no. 457, pp. 555–576, DP130103966 (2013-2016) (Refereed Journal Article)

Book Chapters

- [1] Hastings, Justin 2023, 'United Nations sanctions and North Korean diplomatic engagement with the international community' in Snyder, Scott & Park, Kyung-ae (eds.), *North Korea's Foreign Policy: The Kim Jong Un Regime in a Hostile World*, Rowman & Littlefield, Lanham, MD
- [2] Hastings, Justin 2020, 'North Korea's interaction with the international economy' in Buzo, Adrian (ed.), *Handbook of Contemporary North Korea*, Routledge, DP140102098 (2014-2019)
- [3] Hastings, Justin 2019, 'More creative, more international: Shifts in Uyghur violence' in Wright, Teresa (ed.), *Handbook of Protest and Resistance in China*, Edward Elgar, Cheltenham
- [4] Hastings, Justin 2017, 'An Australian perspective on the new type of great power relations' in Zhong, Feiteng (ed.), *Across Thucydides Trap: The new type of great power relations and building of international order*, Chinese Social Sciences Press, Beijing, pp. 136-154
- [5] Hastings, Justin 2015, 'Globalization, Ma Ying-jeou, and the future of transnational criminal networks' in Chu, Ming-chin & Kastner, Scott (eds.), *Globalization in the shadow of power: New approaches to security relations across the Taiwan Strait*, Routledge, New York and London, pp. 135-157
- [6] Hastings, Justin 2015, 'China and the Straits of Malacca' in Tan, Andrew (ed.), *Security and Conflict in East Asia*, Routledge, London and New York, pp. 102-110
- [7] Hastings, Justin 2014, 'Strategic hypocrisy: Sovereignty, legitimacy, and commerce in archipelagic Southeast Asia' in White, Lynn, Rigger, Shelley & Zhou, Kate (eds.), *Democratization in China, Korea, and Southeast Asia? Local and national perspectives*, Routledge, New York and London, pp. 51-65
- [8] Hastings, Justin 2013, 'The ambiguous political economy of terrorism in Southeast Asia's borderlands' in Hathaway, Robert & Wills, Michael (eds.), *New Security Challenges in Asia*, Woodrow Wilson Center Press, Washington, DC, pp. 198-223
- [9] Hastings, Justin 2013, 'Consequences of the Nuclear Renaissance for non-state nuclear trafficking' in Stulberg, Adam & Fuhrmann, Matthew (eds.), *The Nuclear Renaissance and International Security*, Stanford University Press, Stanford, pp. 223-249

[10] Hastings, Justin 2013, 'Maritime security in East and Southeast Asia' in Tan, Andrew (ed.), *East and South-East Asia: International Relations and Security Perspectives*, Routledge, London, pp. 246-256

[11] Hastings, Justin 2008, 'Corruption's corrosive effect on counterinsurgency: The Free Aceh Movement in South-east Asia' in Cox, Michaelene (ed.), *State of Corruption, State of Chaos: The Terror of Political Malfeasance*, Lexington Books, Lanham, MD

Refereed Journal Articles

[1] Hastings, Justin & Lee, Haneol 2023, 'Tracking North Korean economic transformation and trends in economic research', *Asia and the Global Economy*, vol. 3, no. 1

[2] Hastings, Justin, Baxter, Philip, Kim, Philseo & Yim, Man-sung 2022, 'Mapping the development of North Korea's domestic nuclear research networks', *Review of Policy Research*, vol. 39, no. 2, pp. 219-246

[3] Hastings, Justin 2022, 'North Korean trade networks under sanctions and implications for denuclearization', *Asia in the Global Economy*, vol. 2, no. 1, DP140102098 (2014-2019)

[4] Parvez, Saimum & Hastings, Justin 2022, 'Digital media, social networks, and women's participation in terrorism', *Small Wars and Insurgencies*

[5] Asal, Victor, Hastings, Justin V & Rethemeyer, Karl 2020, 'Maritime Insurgency', *Terrorism and Political Violence*, pp. 1–23, DP130103966 (2013-2016)

[6] Hastings, Justin V 2020, 'The Return of Sophisticated Maritime Piracy to Southeast Asia', *Pacific Affairs*, vol. 93, no. 1, pp. 5–30, DP130103966 (2013-2016)

[7] Song, Annie Young & Hastings, Justin V 2020, 'Engaging North Korea: environmental cooperation in peacebuilding', *Third World Quarterly*, pp. 1–19

[8] Hastings, Justin V 2018, 'The Complex Relationship between Sanctions and North Korea's Illicit Trade', *Asia Policy*, vol. 25, no. 3, pp. 28–34, DP140102098 (2014-2019)

[9] Hastings, Justin V & Wang, Yaohui 2018, 'INFORMAL TRADE ALONG THE CHINA–NORTH KOREA BORDER.', *Journal of East Asian Studies*, vol. 18, no. 2, DP140102098 (2014-2019)

[10] Hastings, Justin V, Lee, Haneol & Kelley, Robert 2018, 'North Korea's Lithium Research Networks and its Quest for a Hydrogen Bomb', *The Korean Journal of Defense Analysis*, vol. 30, no. 3, pp. 337–352, DP140102098 (2014-2019), FT160100235 (2017-2022)

[11] Hastings, Justin V & Phillips, Sarah G 2018, 'Order beyond the state: explaining Somaliland's avoidance of maritime piracy', *The Journal of Modern African Studies*, vol. 56, no. 1, pp. 5, DP130103966 (2013-2016)

[12] Hastings, Justin V & Vestergaard, Cindy 2018, 'Safeguards and security risks at the (very) front end of the nuclear fuel cycle', *The Nonproliferation Review*, vol. 25, no. 5-6, pp. 457–476, FT160100235 (2017-2022)

[13] Hastings, Justin V & Wang, Yaohui 2017, 'Chinese Firms' Troubled Relationship with Market Transformation in North Korea', *Asian Survey*, vol. 57, no. 4, pp. 618–640, DP140102098 (2014-2019)

[14] Hastings, Justin V & Naz, Farah 2017, 'The trials and travails of the Islamic State in Pakistan', *Australian Journal of International Affairs*, vol. 71, no. 3, pp. 335–353

[15] Asal, Victor & Hastings, Justin V 2015, 'When terrorism goes to sea: terrorist organizations and the move to maritime targets', *Terrorism and Political Violence*, vol. 27, no. 4, pp. 722–740, DP130103966 (2013-2016)

[16] Griffin, Penny, Hastings, Justin & Park, Susan 2013, 'INTRODUCTION: Asia Pacific going forward: a view from OCIS V', *Global Change, Peace & Security*, vol. 25, no. 1, pp. 1–4

[17] Hastings, Justin V & Chan, Ryan J 2013, 'Target hardening and terrorist signaling: The case of aviation security', *Terrorism and Political Violence*, vol. 25, no. 5, pp. 777–797

[18] Hastings, Justin V 2012, 'The geography of nuclear proliferation networks: The case of AQ Khan', *The Nonproliferation Review*, vol. 19, no. 3, pp. 429–450

[19] Hastings, Justin V 2011, 'Charting the course of Uyghur unrest', *The China Quarterly*, pp. 893–912

- [20] Hastings, Justin V 2011, 'The fractured geopolitics of the United States in the Indian Ocean Region', *Journal of the Indian Ocean Region*, vol. 7, no. 2, pp. 183–199
- [21] Hastings, Justin V 2009, 'Illicit Flows in the Hong Kong-China-Taiwan Triangle', *Issues & Studies*, vol. 45, no. 2, pp. 185–220
- [22] Hastings, Justin V 2008, 'Geography, globalization, and terrorism: The plots of Jemaah Islamiyah', *Security Studies*, vol. 17, no. 3, pp. 505–530
- [23] Hastings, Justin V 2005, 'Perceiving a single Chinese state: escalation and violence in Uighur protests', *Problems of Post-Communism*, vol. 52, no. 1, pp. 28–38

Additional Research Outputs

- [1] Hastings, Justin V., "Maritime Crime Associated with Weapons of Mass Destruction Proliferation and Sanctions Evasion," issue paper for United Nations Global Maritime Crime Program, United Nations Office on Drugs and Crime, May 2022.
- [2] Hastings, Justin V., 2022 "Maritime Crime Associated with Weapons of Mass Destruction Proliferation and Sanctions Evasion," issue paper for United Nations Global Maritime Crime Program, United Nations Office on Drugs and Crime
- [3] Hastings, Justin V., "Further Indonesia transaction-level import/export data analysis for HS codes of interest (2019-2020)," technical report for Division of Information Management, Department of Safeguards, International Atomic Energy Agency, May 2021., FT160100235 (2017-2019)
- [4] Hastings, Justin V., "Indonesia transaction-level import/export data analysis for HS code 2844 for 2019-2020: Initial thoughts," technical report for Division of Information Management, Department of Safeguards, International Atomic Energy Agency., FT160100235 (2017-2022)
- [5] Hastings, Justin V., Wertz, Daniel, and Yeo, Andrew, "Market activities and the building blocks for civil society in North Korea," report for National Committee on North Korea, Washington, DC, February 2021.
- [6] Sinpeng, Aim, Agarwal Nitin, and Hastings, Justin, "Strengthening Australia's Information Warfare Capabilities in Fighting Foreign Interference and Propaganda," University of Sydney, technical report for Australian Department of Defence, July 2021.
- [7] Hastings, Justin V., 2020 "Malaysia Pilot Case Study," technical report for Division of Information Management, Department of Safeguards, International Atomic Energy Agency, FT160100235 (2017-2022)
- [8] Hastings, Justin V., and Lee, Haneol, 2020 "HS Code Trade Network Analysis: Indonesia Case Study," technical report for Division of Information Management, Department of Safeguards, International Atomic Energy Agency, FT160100235 (2017-2022)
- [9] Hastings, Justin V., Asal, Victor, Ackerman, Gary, and Guarrieri, Thomas, 2018 "Illicit Networks and the Nuclear Fuel Cycle in South-east Asia," technical report for US Department of Defense Project on Advanced Systems and Concepts for Combating Weapons of Mass Destruction
- [10] Hastings, Justin V., Stulberg, Adam, and Baxter, Philip. 2017. "Nuclear Technology, Materials, and Knowledge Transfer Networks: Middle East Brief", brief for MacArthur Foundation
- [11] Hastings, Justin V., Stulberg, Adam, and Baxter, Philip. 2017. "Nuclear Technology, Materials, and Knowledge Transfer Networks: Southeast Asia Brief", brief for MacArthur Foundation
- [12] Baxter, Philip, Stulberg, Adam, and Hastings, Justin V. 2016. "Examining subject matter networks of tacit knowledge development: The Pakistan nuclear program case study", brief for MacArthur Foundation
- [13] Hastings, Justin V., Stulberg, Adam, and Baxter, Philip. 2015. "Technology, materials and knowledge transfer in nuclear proliferation networks", white paper for MacArthur Foundation
- [14] Yang, Lynn I, Hastings, Justin & Szczepanowska, Aleksandra M, 1999 'China's Environmental Security: Implications for US Interests and Opportunities for Military-to-Military Engagement.' Institute for Defense Analyses, Alexandria, VA.

F20. Is the participant applying for Teaching Relief?

(This is a 'Yes' or 'No' question.
(This question must be answered if the participant is a Chief Investigator)
• If you select 'Yes' you will be prompted to request the percentage of Teaching Relief for each requested year (25, 50, 75 or 100 per cent).
• The percentage of Teaching Relief will be automatically calculated and the request will be generated in Question E1.
• Note: CIs may request funding for teaching relief in order to maximise the opportunity for the CI to conduct research. This question is only relevant for CIs and will not be activated for PIs.)

Yes				
Year 1	Year 2	Year 3	Year 4	Year 5
50%	0%	0%	0%	0%

Part F - Participant Details including ROPE (A/Prof Andrey Vasnev)

F1. Personal Details

(To update any Personal Details, click on the 'Manage Personal Details' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.

Note: The date of birth, country of birth, material personal interests and Indigenous status section will not appear in the PDF version of the form and will not be visible to assessors.

Data may be shared with other Commonwealth Entities.

All information contained in Part F is visible to the Administering Organisation on this application.)

Participation Type

Chief Investigator

Title

A/Prof

First Name

Andrey

Middle Name

Vasnev

F4. Qualifications

(To update any qualifications, click on the 'Manage Qualifications' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.)

Conferral Date	AQF Level	Degree/Award Title	Discipline/Field	Awarding Organisation	Country of Award
01/12/2006	Doctoral Degree	PhD	Economics	Tilburg University	Netherlands
01/07/2001	Masters Degree	M.A.	Economics	New Economic School	Russian Federation
01/07/1998	Bachelor Honours Degree, Graduate Certificate, Graduate Diploma	Diploma	Applied Mathematics	Moscow State University	Russian Federation

F5. Research Load (non-ARC Grants and Research)

(Provide details of research funding from non-ARC sources (in Australia and overseas). For research funding from non-ARC sources, list all projects/applications/awards/fellowships awarded or requests submitted involving that participant for funding for the years 2023 to 2029 inclusive.)

Uploaded PDF file follows on next page.

F5. Research Load (non-ARC Grants and Research) (A. Vasnev)

Description (All named investigators on any application or grant/fellowship in which a participant is involved, project title, source of support, scheme and round)	Same Research Area (Yes/No)	Support Status (Requested/Current/Past)	Application/ Project ID (for NHMRC applications only)	2023 \$'000	2024 \$'000	2025 \$'000	2026 \$'000	2027 \$'000	2028 \$'000	2029 \$'000
				0	0	0	0	0	0	0

F6. What will your time commitment be to research activities related to this project?

(Enter your time commitment to this project as a Full-Time Equivalent (FTE). Note that a FTE of 1.0 represents a full-time commitment (i.e. 5 days per week).)

0.2

F7. Eligibility - Employment Details as at grant commencement date

(This question will be used to determine your eligibility. Your eligibility will be based solely on the information contained in this application. Confirm your employment status at all organisations that you will be associated with as at 1 January 2024. Enter the relevant appointment type and Full-Time Equivalent (FTE) for each organisation.)

Org name	Is this an Eligible Organisation?	Please choose your appointment type for this organisation.	Please enter your FTE for this Organisation
The University of Sydney	Yes	Employee	1

F8. Eligibility - Relevant Organisation for this application as at grant commencement date for this project

(Enter the Organisation that is relevant to your participation on this application, and that you will be associated with as at 1 January 2024. The 'relevant organisation' is the primary organisation that will be supporting your involvement in this project if it is funded. Note that the Organisation must be listed in F7 for this question to validate.)

Relevant Organisation

The University of Sydney

F9. Eligibility - Currently held ARC Projects

(This information is auto-populated. If you have any concerns with the information recorded here, please contact your Administering Organisation's Research Office.)

F10. Eligibility - Will the participant reside in Australia for more than 50 per cent of the project activity period?

(This is a 'Yes' or 'No' question. Indicate whether the participant will be residing in Australia for more than 50 per cent of the project activity period. If the participant is applying as a CI and the answer to this question is 'No' they will be prompted to contact their Research Office to check their eligibility.)

Yes

F11. Eligibility - Will the participant undertake a Higher Degree by Research during the project activity period?

(This is a 'Yes' or 'No' question. If the participant is applying as a CI and their answer is 'Yes' to this question they will be prompted to contact their Research Office. Eligibility will be based solely on the information contained in this application.)

No

F12. Eligibility - Project Relinquishment or Application Withdrawal

(ARC grant guidelines specify the limits on the number of applications and projects per named participant. This question will be activated where a participant will exceed ARC project limits at the grant opportunity closing date, if this application is successful. While the application can be submitted, project limits must be met under the grant

guidelines before the project can start. Project limits can be met by relinquishing existing active project(s), or relinquishing role(s) on existing active projects, or withdrawing application(s) that would exceed the project limits. This does not need to occur until all applications are announced.)

F13. Eligibility - Further Details Regarding Partner Investigator Status - Will the participant hold either a remunerated or honorary academic appointment at an Eligible Organisation as at the grant commencement date for this project?

(This is a 'Yes' or 'No' question.
At Question A2 Partner Investigator has been selected as the role type, but it appears that the participant meets the criteria of a Chief Investigator.
NOTE: this question is mandatory ONLY FOR PIs WHO:
• at Question F10 confirmed that they will reside predominantly (greater than 50 per cent of their time) in Australia for the project activity period of the proposed project; AND
• at Question F11 confirmed that they are not currently undertaking a Higher Degree by Research which will be conferred after 1 January 2024; AND
• at Question F7 indicated that at the grant commencement date they would hold either:
- an appointment at an Eligible Organisation equal or greater than 0.2 FTE; OR
- an honorary academic appointment at an Eligible Organisation
If the participant selects 'Yes', they will be further prompted to justify their participation on this application as a PI with reference to the grant guidelines. As part of your justification indicate whether the role is remunerated.
)
Do you hold either a remunerated or an honorary academic appointment at an Eligible Organisation?

Justification of PI status

F14. Is the participant providing research input on this project?

(This is a Yes/No question for Partner Investigators (PI) only. If the PI answers 'Yes', the ROPE questions will be activated. You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section. If the participant answers 'No', they will be asked to upload a 2 page CV to support the PI's involvement in the proposed project. The 2 page CV must be relevant to the application and can include significant career interruptions. It is up to the participant to determine the appropriate information to include in the CV. Please read the Instructions to Applicants for further detail.)

Are you providing research Input?

Research Career - Provide a 2 page CV to support the Partner Investigator's involvement in the proposed project. (Upload a PDF of up to 2 A4 pages)

No PDF file uploaded.

F15. Research Opportunity and Performance Evidence (ROPE) - Current and previous appointment(s) / position(s) - during the past 10 years

(To update any details in this table, click on the 'Manage Employment Details' link in this question. Note this will open in a new browser tab. 'Refresh' the application page when returning to the form to capture changes made to the participant's profile.)

Description	Department	Contract Type	Employment Type	Start Date	End Date	Organisation
-------------	------------	---------------	-----------------	------------	----------	--------------

Associate Professor	Business School	Permanent	Full Time	01/01/2023		The University of Sydney
Associate Professor and Head of Discipline	Business School	Permanent	Full Time	16/04/2020	31/12/2022	The University of Sydney
Associate Professor	Business School	Permanent	Full Time	01/01/2018	15/04/2020	The University of Sydney
Senior Lecturer	Business School	Permanent	Full Time	01/01/2014	31/12/2017	The University of Sydney
Lecturer	Business School	Permanent	Full Time	28/01/2008	31/12/2013	The University of Sydney

F16. Research Opportunity and Performance Evidence (ROPE) - Career Interruptions

(You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-robe-statement> before filling out this section.)

Has the participant experienced a significant interruption that has impacted on research opportunity?

Yes

From when

04/10/2014

To when

04/10/2015

FTE of academic interruption

1

Interruption Category

Caring and parental responsibilities

Details

parental leave to look after my daughter born 4/10/2014

From when

03/09/2017

To when

30/06/2018

FTE of academic interruption

1

Interruption Category

Caring and parental responsibilities

parental leave to look after my son born 3/09/2017

F17. Research Opportunity and Performance Evidence (ROPE) - Details of the participant's career and opportunities for research, evidence of research impact and contributions to the field, including those most relevant to this application

(Provide details of the participant's circumstances and opportunities. This should not include information presented in the following questions (upload a PDF of up to 5 A4 pages).)

Uploaded PDF file follows on next page.

F17 ROPE (A. Vasnev)

AMOUNT OF TIME AS AN ACTIVE RESEARCHER

I was awarded my PhD 16 years ago, in 2006, and in that period, I experienced a total of 1 year and 10 months (at 1.0 FTE) of career interruptions. In 2015 I was on parental leave for nine months to take care of my newborn daughter. I also took parental leave to look after my newborn son in 2017 but returned part-time in 2018 to perform the administrative duties of the deputy head of the discipline.

RESEARCH OPPORTUNITIES

After working as a credit risk researcher in one of the biggest banks in the Netherlands for 16 months, I have decided to return to academia. I started as a lecturer at the University of Sydney in January 2008, was promoted to senior lecturer in January 2014 and an associate professor in January 2018. During this time, the university and the department went through several restructures, and my current position is in the discipline of Business Analytics at the University of Sydney Business School. Until early 2020, I spent about 40% of my time on research, 40% on teaching and 20% on service to the university, profession and community. From April 2020, I took the role of the head of the discipline of Business Analytics, and my workload is 40% research, 20% teaching and 40% service. The role was extremely demanding and testing during the pandemic. In 2020 especially with the rapid transition to online teaching, I had very little time for research. I finished this leadership role at the end of 2022 and am now back to my regular research activities.

I have a constant stream of publications in top peer-reviewed journals ranked A* or A in the ABDC list. My presentations are accepted for leading international conferences, and on many occasions, I have been invited to chair sessions and organized sessions at several international conferences.

I undertook six months of study leave in 2011, 2014, 2018 and 2012, which has helped my career.

RESEARCH ACHIEVEMENTS AND CONTRIBUTIONS

After receiving my PhD in 2006, most of my journal publications are in A and A* journals as given by Australian Business Dean Council (ABDC) Ranking. As of 7 February 2023, *Scopus* produces h-index 7, and Google Scholar gives 479 citations with h-index 11 and i10-index 11. My most cited paper is "The forecast combination puzzle: A simple theoretical explanation." It is cited 206 times, according to Google Scholar, even though it was published in 2016.

The majority of my publications are in the area of forecast combination. It is a well-established area with many applied papers appearing every year. This area has practical significance as there is often more than one forecast available in real-life situations, and they have to be consolidated. A simple example is inflation prediction. Some experts or models

predict that it will go up, while others predict that it will go down. One way to consolidate different points of view is to take a weighted average of inflation forecasts. Often the aggregated forecast has better properties than individual forecasts. My specific interests in this area are in the methodology of combining the information from different levels (for example, monthly and quarterly information) and the choice of the weights when combining different forecasts.

I am regularly asked to referee papers in the area of forecast combination for leading international journals, including *Management Science* and *International Journal of Production Economics* (both ranked A* in ADBC ranking). However, I focus my review activity on the *International Journal of Forecasting*, which is the leading journal in my area. I also acted as an expert witness in several Federal Court of Australia Proceedings (in 2013-2020) and in one Australian Supreme Court Proceedings (in 2011-2012) in the cases that involve quantitative matters.

My most recent engaged project is the creation of the public forecasting website business-forecast-lab.com. This is an intuitive, high-quality website that makes business forecasting accessible to the wider community. The goal is to make the website the default 'go-to' place for everyone who needs to predict common or specific time series. The forecasting website aims to implement classical forecasting models as well as the novel models and methods developed by the members of the Time Series and Forecasting (TSF) research group in the University of Sydney Business School. The website visualises and summarises the forecasting results in an easy-to-understand manner. The forecasts are updated daily and include the latest publicly available information. The website is implemented in Python; it is an open-source project, and the code is available under the AGPL license at github.com/forecastlab/forecast_dash.

F18. Research Opportunity and Performance Evidence (ROPE) - Research Output Context

(Research context: Provide clear information that explains the relative importance of different research outputs and expectations in the participant's discipline/s. The information should help assessors understand the context of the participant's academic research achievements but not repeat information already provided in this application. It is helpful to include the importance/esteem of specific journals in their field; specific indicators of recognition within their field such as first authorship/citations, or the significance of non-traditional research outputs. If preprints or comparable resources are cited, these should be explicitly identified in the reference list by including [PREPRINT OR COMPARABLE] after the reference. The reference should include a DOI, URL or equivalent, version number where available and/or date of access, as applicable. If this question is not relevant to a participant, for example a PI with non-academic background, the participant should include a short explanatory statement as to why this question is not applicable (up to 3,750 characters, approximately 500 words).)

The publication practices in my discipline are centred around journal publications. Books and book chapters are rare. They are considered equivalent to Tier 2 publication, which is somewhere in between level B- and C-journal publications. The peer review in my area is still extremely slow. It is not unusual to wait 12 months for referee reports. There are only a few journals that are committed to providing feedback within 6 months. As a result, the median number of publications at the associate professor level is just under 1.5 papers per year and even lower if targeting A and A* journals. The average number of my publications is above the median, which is a considerable achievement given the interruptions and significant administrative responsibilities during the last 6 years.

To provide more details, I will focus on the forecasting area relevant to the current application round. The top journal in this area is the International Journal of Forecasting. I regularly publish in this journal, and I am the default referee for forecast combination papers. My most cited article on the forecast combination puzzle appeared in this journal. When my research has broader implications, I also publish in journals with more general outreach, for example, the Journal of Applied Econometrics or Omega, which are top journals in the corresponding areas.

I avoided a publication gap when I was on two parental leaves. If parental leaves are taken into account, then the current average number of publications per year is around 3. Most of my publications are in Tier 3/ A journals. (Here and after I will use the University of Sydney Business School rankings where Tier 4 is the highest category complemented with Australian Business Deans Council rankings where A* is the highest category.) In 2014 I had a publication in the Journal of Applied Econometrics (Tier 4/A* journal), and in 2018, I have a publication in Omega (Tier 4/A journal). 2022 was my record year with 6 publications (some publications appeared in print in 2023), three of each in Tier 3/A journals.

F19. Research Opportunity and Performance Evidence (ROPE) – Research Outputs Listing including 10 Career-Best Research Outputs

(Provide a list of research outputs marking those that are most relevant to this application categorised under the following headings: 10 career-best research outputs; Authored books; Edited books; Book chapters; Refereed Journal articles; Fully refereed conference proceedings; Additional research outputs (including non-traditional research outputs and preprints or comparable resources). CVs and theses should not be included in this list. The participant's 10 career-best research outputs should not be repeated under subsequent headings (up to 100 research outputs).)

Research Outputs Listing

Generated research output document follows on the next page

Ten Career-Best Research Outputs

- [1] * Claeskens, G., Magnus, J.R., Vasnev, A.L. & Wang, W. 2016, 'The forecast combination puzzle: A simple theoretical explanation', *International Journal of Forecasting*, vol. 32, no. 3, pp. 754-762 (Refereed Journal Article)
- [2] * Matsypura, D., Thompson, R. & Vasnev, A.L. 2018, 'Optimal selection of expert forecasts with integer programming', *Omega (United Kingdom)*, vol. 78, pp. 165-175 (Refereed Journal Article)
- [3] * Jan R. Magnus & Andrey L. Vasnev 2022, 'On the uncertainty of a combined forecast: The critical role of correlation', *International Journal of Forecasting*, doi:10.1016/j.ijforecast.2022.10.002 (Refereed Journal Article)
- [4] * Justin V Hastings, Sarah G Phillips, David Ubilava & Andrey Vasnev 2021, 'Price Transmission in Conflict-Affected States: Evidence from Cereal Markets of Somalia', *Journal of African Economies*, vol. 31, no. 3, pp. 272–291, doi:10.1093/jae/ejab012 (Refereed Journal Article)
- [5] * Peter Radchenko, Andrey L. Vasnev & Wendun Wang 2023, 'Too similar to combine? On negative weights in forecast combination', *International Journal of Forecasting*, vol. 39, no. 1, pp. 18–38, doi:10.1016/j.ijforecast.2021.08.002 (Refereed Journal Article)
- [6] * Magnus, J.R. & Vasnev, A.L. 2015, 'Interpretation and use of sensitivity in econometrics, illustrated with forecast combinations', *International Journal of Forecasting*, vol. 31, no. 3, pp. 769-781 (Refereed Journal Article)
- [7] * Pauwels, L.L. & Vasnev, A.L. 2016, 'A note on the estimation of optimal weights for density forecast combinations', *International Journal of Forecasting*, vol. 32, no. 2, pp. 391-397 (Refereed Journal Article)
- [8] * Pauwels, L.L. & Vasnev, A.L. 2017, 'Forecast combination for discrete choice models: predicting FOMC monetary policy decisions', *Empirical Economics*, vol. 52, no. 1, pp. 229-254 (Refereed Journal Article)
- [9] * Magnus, J.R. & Vasnev, A.L. 2008, 'Using macro data to obtain better micro forecasts', *Econometric Theory*, vol. 24, no. 2, pp. 553-579 (Refereed Journal Article)
- [10] * Pauwels, L. & Vasnev, A. 2014, 'Forecast combination for U.S. recessions with real-time data', *North American Journal of Economics and Finance*, vol. 28, pp. 138-148 (Refereed Journal Article)

Refereed Journal Articles

- [1] Lore Dirick, Gerda Claeskens, Andrey Vasnev & Bart Baesens 2022, 'A hierarchical mixture cure model with unobserved heterogeneity for credit risk', *Econometrics and Statistics*, vol. 22, pp. 39–55, doi:10.1016/j.ecosta.2020.12.002
- [2] Renlong Jie, Junbin Gao, Andrey Vasnev & Minh-Ngoc Tran 2022, 'Adaptive hierarchical hyper-gradient descent', *International Journal of Machine Learning and Cybernetics*, vol. 13, no. 12, pp. 3785–3805, doi:10.1007/s13042-022-01625-4
- [3] MOAWIA ALGHALITH, NORMAN SWANSON, ANDREY VASNEV & WING-KEUNG WONG 2021, 'EDITORIAL STATEMENT IN HONOR OF PROFESSOR MICHAEL MCALEER', *Annals of Financial Economics*, vol. 16, no. 03, doi:10.1142/s2010495221010028
- [4] Leigh-Anne Hepburn, Madeleine Borthwick, Jane Kerr & Andrey Vasnev 2021, 'A strategic framework for delivering ongoing feedback at scale', *Assessment & Evaluation in Higher Education*, vol. 47, no. 5, pp. 742–754, doi:10.1080/02602938.2021.1959517
- [5] Renlong Jie, Junbin Gao, Andrey Vasnev & Minh-Ngoc Tran 2020, 'HyperTube: A Framework for Population-Based Online Hyperparameter Optimization with Resource Constraints', *IEEE Access*, vol. 8, pp. 69038–69057, doi:10.1109/access.2020.2986456
- [6] * Qingfeng Liu & Andrey L. Vasnev 2019, 'A Combination Method for Averaging OLS and GLS Estimators', *Econometrics*, vol. 7, no. 3, pp. 38, doi:10.3390/econometrics7030038
- [7] * Sutton, M., Vasnev, A.L. & Gerlach, R. 2019, 'Mixed interval realized variance: A robust estimator of stock price volatility', *Econometrics and Statistics*, vol. 11, pp. 43-62
- [8] Christodoulou, D., Ma, L. & Vasnev, A. 2018, 'Inference-in-residuals as an Estimation Method for Earnings Management', *Abacus*, vol. 54, no. 2, pp. 154-180
- [9] Watkins, J.G.T., Vasnev, A.L. & Gerlach, R. 2014, 'Multiple event incidence and duration analysis for credit data incorporating non-stochastic loan maturity', *Journal of Applied Econometrics*, vol. 29, no. 4, pp. 627-648
- [10] * Vasnev, A., Skirtun, M. & Pauwels, L. 2013, 'Forecasting monetary policy decisions in Australia: A forecast combinations approach', *Journal of Forecasting*, vol. 32, no. 2, pp. 151-166

- [11] Vasnev, A.L. 2010, 'Sensitivity of GLS estimators in random effects models', *Journal of Multivariate Analysis*, vol. 101, no. 5, pp. 1252-1262
- [12] Magnus, J.R. & Vasnev, A.L. 2007, 'Local sensitivity and diagnostic tests', *Econometrics Journal*, vol. 10, no. 1, pp. 166-192
- [13] Anatolyev, S. & Vasnev, A. 2002, 'Markov chain approximation in bootstrapping autoregressions', *Economics Bulletin*, vol. 3, no. 1

Fully Refereed Conference Proceedings

- [1] Renlong Jie, Junbin Gao, Andrey Vasnev & Minh-ngoc Tran 2021, 'Regularized Flexible Activation Function Combination for Deep Neural Networks', *2020 25th International Conference on Pattern Recognition (ICPR)*, doi:10.1109/icpr48806.2021.9412370
- [2] Pauwels, L.L. & Vasnev, A. 2011, 'Forecast combination for discrete choice models: Predicting FOMC monetary policy decisions', *MODSIM 2011 - 19th International Congress on Modelling and Simulation - Sustaining Our Future: Understanding and Living with Uncertainty*, pp. 1753-1759
- [3] Vasnev, A.L. 2010, 'Sensitivity analysis for quantile regression', *Procedia - Social and Behavioral Sciences*, vol. 2, no. 6, pp. 7759-7760

F20. Is the participant applying for Teaching Relief?

- (This is a 'Yes' or 'No' question.
(This question must be answered if the participant is a Chief Investigator)*
- If you select 'Yes' you will be prompted to request the percentage of Teaching Relief for each requested year (25, 50, 75 or 100 per cent).*
 - The percentage of Teaching Relief will be automatically calculated and the request will be generated in Question E1.*
 - Note: CIs may request funding for teaching relief in order to maximise the opportunity for the CI to conduct research. This question is only relevant for CIs and will not be activated for PIs.)*

No

Part F - Participant Details including ROPE (Dr Ashani Amarasinghe)

F1. Personal Details

(To update any Personal Details, click on the 'Manage Personal Details' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.

Note: The date of birth, country of birth, material personal interests and Indigenous status section will not appear in the PDF version of the form and will not be visible to assessors.

Data may be shared with other Commonwealth Entities.

All information contained in Part F is visible to the Administering Organisation on this application.)

Participation Type

Chief Investigator

Title

Dr

First Name

Ashani

Middle Name

Samindika Kumari

Family Name

Amarasinghe

F4. Qualifications

(To update any qualifications, click on the 'Manage Qualifications' link below. Note this will open a new browser tab. When returning to the form ensure to 'Refresh' the page to capture the changes made to the participant's profile.)

Conferral Date	AQF Level	Degree/Award Title	Discipline/Field	Awarding Organisation	Country of Award
11/06/2020	Doctoral Degree	PhD	Economics	Monash University	Australia
30/04/2011	Bachelor Honours Degree, Graduate Certificate, Graduate Diploma	BA (Honours)	Economics	University of Colombo	Sri Lanka

F5. Research Load (non-ARC Grants and Research)

(Provide details of research funding from non-ARC sources (in Australia and overseas). For research funding from non-ARC sources, list all projects/applications/awards/fellowships awarded or requests submitted involving that participant for funding for the years 2023 to 2029 inclusive.)

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F5. Research Load (non-ARC Grants and Research)

Funding from Non-ARC Sources

Description (All named investigator s on any application or grant/fellow ship in which a participant is involved, project title, source of support, scheme and round)	Same Research Area (Yes/No)	Support Status (Requested/Current/Past)	Application/ Project ID (for NHMRC applications only)	2023 \$'000	2024 \$'000	2025 \$'000	2026 \$'000	2027 \$'000	2028 \$'000	2029 \$'000

F6. What will your time commitment be to research activities related to this project?

(Enter your time commitment to this project as a Full-Time Equivalent (FTE). Note that a FTE of 1.0 represents a full-time commitment (i.e. 5 days per week).)

0.2

F7. Eligibility - Employment Details as at grant commencement date

(This question will be used to determine your eligibility. Your eligibility will be based solely on the information contained in this application. Confirm your employment status at all organisations that you will be associated with as at 1 January 2024. Enter the relevant appointment type and Full-Time Equivalent (FTE) for each organisation.)

Org name	Is this an Eligible Organisation?	Please choose your appointment type for this organisation.	Please enter your FTE for this Organisation
The University of Sydney	Yes	Employee	1.0

F8. Eligibility - Relevant Organisation for this application as at grant commencement date for this project

(Enter the Organisation that is relevant to your participation on this application, and that you will be associated with as at 1 January 2024. The 'relevant organisation' is the primary organisation that will be supporting your involvement in this project if it is funded. Note that the Organisation must be listed in F7 for this question to validate.)

Relevant Organisation

The University of Sydney

F9. Eligibility - Currently held ARC Projects

(This information is auto-populated. If you have any concerns with the information recorded here, please contact your Administering Organisation's Research Office.)

F10. Eligibility - Will the participant reside in Australia for more than 50 per cent of the project activity period?

(This is a 'Yes' or 'No' question. Indicate whether the participant will be residing in Australia for more than 50 per cent of the project activity period. If the participant is applying as a CI and the answer to this question is 'No' they will be prompted to contact their Research Office to check their eligibility.)

Yes

F11. Eligibility - Will the participant undertake a Higher Degree by Research during the project activity period?

(This is a 'Yes' or 'No' question. If the participant is applying as a CI and their answer is 'Yes' to this question they will be prompted to contact their Research Office. Eligibility will be based solely on the information contained in this application.)

No

F12. Eligibility - Project Relinquishment or Application Withdrawal

(ARC grant guidelines specify the limits on the number of applications and projects per named participant. This question will be activated where a participant will exceed ARC project limits at the grant opportunity closing date, if this application is successful. While the application can be submitted, project limits must be met under the grant

guidelines before the project can start. Project limits can be met by relinquishing existing active project(s), or relinquishing role(s) on existing active projects, or withdrawing application(s) that would exceed the project limits. This does not need to occur until all applications are announced.)

F13. Eligibility - Further Details Regarding Partner Investigator Status - Will the participant hold either a remunerated or honorary academic appointment at an Eligible Organisation as at the grant commencement date for this project?

(This is a 'Yes' or 'No' question.
At Question A2 Partner Investigator has been selected as the role type, but it appears that the participant meets the criteria of a Chief Investigator.
NOTE: this question is mandatory ONLY FOR PIs WHO:
• at Question F10 confirmed that they will reside predominantly (greater than 50 per cent of their time) in Australia for the project activity period of the proposed project; AND
• at Question F11 confirmed that they are not currently undertaking a Higher Degree by Research which will be conferred after 1 January 2024; AND
• at Question F7 indicated that at the grant commencement date they would hold either:
- an appointment at an Eligible Organisation equal or greater than 0.2 FTE; OR
- an honorary academic appointment at an Eligible Organisation
If the participant selects 'Yes', they will be further prompted to justify their participation on this application as a PI with reference to the grant guidelines. As part of your justification indicate whether the role is remunerated.
)
Do you hold either a remunerated or an honorary academic appointment at an Eligible Organisation?

Justification of PI status

F14. Is the participant providing research input on this project?

(This is a Yes/No question for Partner Investigators (PI) only. If the PI answers 'Yes', the ROPE questions will be activated. You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section. If the participant answers 'No', they will be asked to upload a 2 page CV to support the PI's involvement in the proposed project. The 2 page CV must be relevant to the application and can include significant career interruptions. It is up to the participant to determine the appropriate information to include in the CV. Please read the Instructions to Applicants for further detail.)

Are you providing research Input?

Research Career - Provide a 2 page CV to support the Partner Investigator's involvement in the proposed project. (Upload a PDF of up to 2 A4 pages)

No PDF file uploaded.

F15. Research Opportunity and Performance Evidence (ROPE) - Current and previous appointment(s) / position(s) - during the past 10 years

(To update any details in this table, click on the 'Manage Employment Details' link in this question. Note this will open in a new browser tab. 'Refresh' the application page when returning to the form to capture changes made to the participant's profile.)

Description	Department	Contract Type	Employment Type	Start Date	End Date	Organisation
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Lecturer	School of Economics	Permanent	Full Time	01/07/2022		The University of Sydney
Research Fellow	SoDa Laboratories	Contract	Full Time	01/07/2020	30/06/2022	SoDa Laboratories, Monash Business School, Monash University
Research Associate	Economics	Contract	Full Time	01/03/2020	30/06/2020	Monash University
Teaching Associate	Economics	Contract	Part Time	01/07/2016	30/06/2020	Monash University

F16. Research Opportunity and Performance Evidence (ROPE) - Career Interruptions

(You must read the ROPE Statement <http://www.arc.gov.au/arc-research-opportunity-and-performance-evidence-rope-statement> before filling out this section.)

Has the participant experienced a significant interruption that has impacted on research opportunity?

No

F17. Research Opportunity and Performance Evidence (ROPE) - Details of the participant's career and opportunities for research, evidence of research impact and contributions to the field, including those most relevant to this application

(Provide details of the participant's circumstances and opportunities. This should not include information presented in the following questions (upload a PDF of up to 5 A4 pages).)

Uploaded PDF file follows on next page.

AMOUNT OF TIME AS AN ACTIVE RESEARCHER

I was awarded my PhD in June 2020 and since then, I have experienced no formal career interruptions. However, the onset of the pandemic right after the submission of my PhD, along with primary carer responsibilities for two children (aged 5 and 1 in 2020) amidst homeschooling and loss of access to childcare, had a major impact on my research productivity. Despite these obstacles, I have been able to produce two top sole-authored publications post-PhD. Three other papers are currently under review at top journals and I have a long pipeline of works in progress which will be materialized into working papers in the next couple of years.

RESEARCH OPPORTUNITIES

- I was awarded the Australian Government's Research Training Program (RTP) scholarship (including stipend) for my PhD at Monash University.
- During 2020-2022 I was employed as a Post-Doctoral Research Fellow at Monash University. This was a 100% research appointment, with some minor administrative responsibilities.
- From July 2022 I am employed as a Lecturer at the University of Sydney, attached to the School of Economics, within the Faculty of Arts and Social Sciences. This appointment is a standard continuing academic staff position, with 40% teaching, 40% research, and 20% governance, leadership, and engagement responsibilities.
- Since 2020, I am the founder and co-organizer of the Applied Young Economist Webinar series, which is a global online platform for early-career economists to present their work, obtain feedback and connect with like-minded researchers. Since inception, the webinar series has hosted approximately 130 webinars, on the Australasian/US West Coast time zone as well as on the European/US East Coast time zone.

RESEARCH ACHIEVEMENTS AND CONTRIBUTIONS

Research Interests and contributions

My research program focuses on the broad areas of political economy and development economics, with a special focus on the reciprocal relationship between the public and their governments. In particular, I study how these parties interact and how external shocks affect the dynamics of this relationship. In the absence of related spatially and temporally granular analyses, within this research agenda, my contribution is through novel empirical investigations using finely granular – both temporally and spatially – data to provide new perspectives on these interactions. I am also passionate about using novel data and tools that complement the fine temporal and spatial granularity of my analyses. My research has important policy implications on the behaviours of the public and their governments.

Recognition and Impact

My research has been well-received in top economics journals. Within my short career, I have already published two sole-authored papers in top-field journals (ABDC A*), i.e. *Journal of Public Economics* and *Journal of Development Economics*. Both these papers use finely granular data to examine how people react to their governments, and how the government in turn reacts to the public, following economic shocks. Both these papers are directly related to the research question in this application. As a junior academic soon out of the PhD, and considering the lengthy nature of the peer review process in Economics, this is a note-worthy performance.

Dissemination

The primary outlet of my research dissemination is peer-reviewed academic journals. As mentioned above, I have published two articles in top journals, with many others at different levels of the peer review process. In addition, I have actively disseminated my research at invited seminars and conferences within Australia and overseas.

Leadership and Engagement

- Since 2020, I am the founder and co-organizer of the Applied Young Economist Webinar series, which is a global online platform for early-career economists to present their work, obtain feedback and connect with like-minded researchers. Since inception, the webinar series has hosted approximately 130 webinars, on the Australasian/US West Coast time zone as well as on the European/US East Coast time zone.
- Since 2022, I am an organizer of the Sydney Development Economics group workshop, which is a platform that brings together Sydney-based development economists.
- In my previous employment as Research Fellow at Monash University's SoDa Laboratories (2020-2022), I was the organizer of the SoDa Labs Webinar series, which attracted researchers from across the world. I coordinated webinars with many top academics from the US and Europe.
- From 2021-2022 I was a member of the leadership board of Monash University's SoDa Laboratories, where I contributed towards the strategic development of the lab.
- I am frequently invited to referee for leading general interest and field journals in economics.

F18. Research Opportunity and Performance Evidence (ROPE) - Research Output Context

(Research context: Provide clear information that explains the relative importance of different research outputs and expectations in the participant's discipline/s. The information should help assessors understand the context of the participant's academic research achievements but not repeat information already provided in this application. It is helpful to include the importance/esteem of specific journals in their field; specific indicators of recognition within their field such as first authorship/citations, or the significance of non-traditional research outputs. If preprints or comparable resources are cited, these should be explicitly identified in the reference list by including [PREPRINT OR COMPARABLE] after the reference. The reference should include a DOI, URL or equivalent, version number where available and/or date of access, as applicable. If this question is not relevant to a participant, for example a PI with non-academic background, the participant should include a short explanatory statement as to why this question is not applicable (up to 3,750 characters, approximately 500 words).)

My research has been published in leading academic journals. In the two years since the completion of the PhD, I have generated two sole-authored publications that appear in A* category journals as per the Australian Business Deans Council ranking (2019 ABDC Journal Quality List). In my 2022 publication in the Journal of Public Economics, I used high-frequency, temporally granular event data extracted from news paper articles to show how governments engage in diversionary strategies when faced with high levels of negative public sentiments. In my recent paper, forthcoming in the Journal of Development Economics, I provide evidence on how the public hold their governments accountable for failing to provide the public good of national security.

In addition to these key publications, I currently have a number of papers under review at top A* journals. The publication process in my field typically take a long time to materialize, due to the high number of articles competing for limited slots in top journals. Almost all research output take the form of journal articles. Conference participation is encouraged but the publishing of conference proceedings is rare. As such, the key output of a researcher is the number of peer-reviewed journal publications. Despite the peer-review system in Economics being extremely slow, I have successfully managed to produce two sole-authored journal articles at top journals, which well exceed the research records of my peers and makes me confident of a positive career trajectory.

F19. Research Opportunity and Performance Evidence (ROPE) – Research Outputs Listing including 10 Career-Best Research Outputs

(Provide a list of research outputs marking those that are most relevant to this application categorised under the following headings: 10 career-best research outputs; Authored books; Edited books; Book chapters; Refereed Journal articles; Fully refereed conference proceedings; Additional research outputs (including non-traditional research outputs and preprints or comparable resources). CVs and theses should not be included in this list. The participant's 10 career-best research outputs should not be repeated under subsequent headings (up to 100 research outputs).)

Research Outputs Listing

Generated research output document follows on the next page

Refereed Journal Articles

[1] * Ashani Amarasinghe 2023, 'Public sentiment in times of terror', *Journal of Development Economics*, vol. 162, pp. 103058, doi:10.1016/j.jdevco.2023.103058

[2] * Ashani Amarasinghe 2022, 'Diverting domestic turmoil', *Journal of Public Economics*, vol. 208, pp. 104608, doi:10.1016/j.jpubeco.2022.1046

F20. Is the participant applying for Teaching Relief?

- (This is a 'Yes' or 'No' question.
(This question must be answered if the participant is a Chief Investigator)*
- If you select 'Yes' you will be prompted to request the percentage of Teaching Relief for each requested year (25, 50, 75 or 100 per cent).*
 - The percentage of Teaching Relief will be automatically calculated and the request will be generated in Question E1.*
 - Note: CIs may request funding for teaching relief in order to maximise the opportunity for the CI to conduct research. This question is only relevant for CIs and will not be activated for PIs.)*

No

Certification

Certification by the Deputy/Pro Vice-Chancellor (Research) or their delegate or equivalent in the Administering Organisation

I certify that—

- I have read, understood and complied with the *Grant Guidelines for the Discovery Program (2021 edition)*, (grant guidelines) and, to the best of my knowledge all details provided in this application form and in any supporting documentation are true and complete in accordance with the grant guidelines.
- Proper enquiries have been made and I am satisfied that the participants and the organisations listed in this application meet the requirements specified in the grant guidelines.
- In certifying the National Interest Test statement, I have considered the requirements detailed in the Instructions to Applicants, including whether the National Interest Test statement is written in plain English and for the audience – the general public.
- The ARC reserves the right to audit any evidence on which an application is based.
- I will notify the ARC if there are changes to any named participant or organisation after the submission of this application.
- The listed participants are responsible for the authorship and intellectual content of this application, and has appropriately cited sources and acknowledged significant contributions to this application.
- To the best of my knowledge, all personal material interests and Conflicts of Interest relating to parties involved in or associated with this application have been disclosed to the Administering Organisation, and, if the application is successful, I agree to manage all Conflicts of Interest relating to this application in accordance with the Australian Code for the Responsible Conduct of Research (2018), the ARC Conflict of Interest and Confidentiality Policy located on the ARC website and any relevant successor documents.
- I have obtained the agreement, attested to by written evidence, of all the relevant persons and organisations necessary to allow the project to proceed. This written evidence has been retained and will be provided to the ARC if requested.
- I have obtained the certification of all organisations contributing to the project (CEO or their delegate) that they support the project, will contribute to the resources outlined in the application, have complied with the grant guidelines and will abide by the relevant Commonwealth grant agreement, including the requirement to enter arrangements for intellectual property.
- The application, including all parties involved in or associated with this application, has undergone due diligence to assess risks from foreign interference in line with the *Guidelines to Counter Foreign Interference in the Australian University Sector (2019)* developed by the University Foreign Interference Taskforce.
- This application complies with the eligible research requirements set out in the ARC Medical Research Policy, located on the ARC website.
- This application does not request funding for the same research activities, infrastructure or project previously funded or currently being funded through any other Commonwealth funding.
- If this application is successful, I am prepared to have the project carried out as set out in this application and agree to abide by the terms and conditions of the grant guidelines and the relevant Commonwealth grant agreement.
- If this application is successful, I confirm that I have appropriate administrative controls in place to manage all governance risks should a participant with an honorary academic appointment for eligibility purposes act as the Project Leader for the duration of the project.
- The project can be accommodated within the general facilities of this organisation and if applicable, within the facilities of other relevant organisations specified in this application and sufficient working and office space is available for any proposed additional staff.
- All funds for this project will only be spent for the purpose for which they are provided.
- The project will not be permitted to commence until there is an ethics plan in place to ensure that the appropriate clearances or other statutory requirements will be met before the part/s of the project that require those clearances

commence.

- I consent, on behalf of all the parties, to this application being referred to third parties, including to overseas parties, who will remain anonymous, for assessment purposes.
- I consent, on behalf of all the parties, to this application being provided to third parties for the purposes of assessment for potential other funding opportunities.
- I consent, on behalf of all the parties, to the ARC copying, modifying and otherwise dealing with information contained in this application for the purpose of conducting the funding round.
- To the best of my knowledge, the Privacy Notice appearing at the top of this form has been drawn to the attention of all the participants whose personal details have been provided in the Participant section of the application.