Research Summary

Miguel Almunia
February 2022

I am an applied microeconomist and my main field of research is empirical public finance. The broad question guiding my research agenda is how economic agents—households and firms—respond to government policies, namely taxes and regulations. I have also studied the impact of aggregate demand shocks on fiscal policy and firms' export behavior. Understanding the effects of economic policies on efficiency and welfare is crucial to improve future policy design. In my work, I use large administrative micro-level datasets covering the population of taxpayers in a variety of countries. In terms of methods, I apply quasi-experimental methods such as bunching, diff-in-diff and instrumental variables in order to identify causal effects.

In this document I provide a detailed summary of my research papers—including both published papers and some ongoing projects—grouped into three research themes: tax compliance, behavioral responses to taxation, fiscal policy and aggregate demand shocks. In the last section, I discuss some research on other topics.

1. Research on tax compliance

Tax evasion and avoidance are pervasive in all countries and have a negative effect on revenue collection. For decades, however, economic research in public finance devoted too little attention to issues related to tax compliance, aiming to characterize optimal tax policies without considering the practical challenges of tax administration. Over time, in recent years it has become evident that these issues are of first-order importance. My research in this area aims to provide new empirical evidence on how taxpayers—mainly business—adjust their behavior in the presence of different tax enforcement policies and what are the consequences for economic efficiency and welfare.

Given that tax authorities have limited resources to enforce tax compliance, they tend to devote a disproportionate share of their compliance efforts to monitoring the largest taxpayers (Bachas, Fattal Jaef and Jensen, 2020). A commonly used policy to achieve this goal is the establishment of a Large Taxpayers Unit (LTU) dedicated to monitoring the largest corporations. In the paper **"Under the Radar: The Effects of Monitoring Firms on Tax Compliance"** (Almunia & Lopez-Rodriguez, *AEJ: Economic Policy* 2018), we exploit quasi-experimental variation generated by the Spanish LTU, which only monitors firms with more than €6 million in annual revenue. We document that firms strategically bunch below the LTU threshold to avoid stricter tax enforcement. Using a bunching estimator (Saez, 2010; Kleven and Waseem, 2013), we find that the response is stronger in sectors where transactions leave more paper trail, e.g., manufacturing and wholesale. The latter result suggests that monitoring effort and the traceability of information reported by firms are complementary. This insight is important

because the existing theoretical frameworks were ambiguous on the question of whether these two elements are complements or substitutes. In the last part of the paper, we interpret our results through the lens of a simple model and show that extending stricter tax monitoring to smaller businesses (i.e., lowering the LTU threshold) would yield substantial welfare gains.

Tax compliance problems are a particular concern in low-income countries. In order to address this issue, governments have adopted tax instruments that have proved successful in advanced economies, such as the value-added tax (VAT), to replace a variety of existing sales and turnover taxes. In theory, the VAT is a more efficient tool to raise revenue than the alternatives due to its "self-enforcing" property (Pomeranz, 2015). This property is based on the fact that the two parties involved in any transaction, seller and buyer, have opposite incentives to evade: to reduce their tax bill, the seller would like to underreport the true transaction amount, while the buyer would like to overreport it. In the paper **"Strategic or Confused Firms? Evidence from Missing Transactions in Uganda"** (Almunia, Hjort, Knebelmann & Tian, forthcoming in the *Review of Economics and Statistics*), we use administrative data on the universe of VAT returns filed by firms in Uganda to assess to what extent this "self-enforcing" property holds in a setting with limited fiscal capacity. Using detailed data at the transaction level, we document that there is a discrepancy in the amount reported by seller and buyer in 79% of transactions. This is despite the fact that all firms file electronically and therefore it should be easy for the revenue authority to cross-check information, although they don't do it routinely. 60% of such discrepancies are due to the seller reporting a smaller amount than the buyer, which we label as "seller shortfall". This is the type of discrepancy you would expect to observe when either the seller or the buyer, or both, are trying to evade taxes. In the remaining 40% of cases, the buyer reports a smaller amount than the seller ("buyer shortfall"). The latter is more puzzling, as it leads to a higher net tax liability for at least one of the firms involved, so it defies the predictions of a standard tax evasion model.

In order to understand the net effects of these two types of discrepancies, we estimate a model in the spirit of Abowd, Kramarz and Margolis (1999), which includes two fixed effects for each firm: one as seller and one as buyer. Using the estimated fixed effects, we categorize firms into "strategic firms", meaning that their misreporting leads them to pay a lower amount of tax than they should, or "confused firms", who systematically overreport their own sales minus purchases such that their tax liability increases. As expected, we find that a majority of firms are strategic, but a non-negligible 25% are "confused" firms. Similarly, many firms—especially confused ones—fail to report imported inputs on their VAT return even when they reported those at Customs, increasing their tax liability. On net, unilateral VAT misreporting cost Uganda about US$384 million in foregone tax revenue in 2013-2016.

In a follow-up ongoing project, **"Information, Fiscal Capacity and Tax Compliance: An Experimental Evaluation"** (with D. Henning, J. Knebelmann and L. Tian), we evaluate a tax compliance intervention that exploits the misreporting measures developed in the previous paper through a randomized-control trial (RCT). Specifically, we randomly assign some seller-buyer pairs to receive letters notifying them that a discrepancy has been found, while other pairs

are part of the control group and receive no letter. This design allows us to study the direct effects of the letters on reporting behavior, and also the spillover effects through the network of business relationships (which we observe in the VAT declarations). This letter experiment has already been implemented and preliminary results indicate that treated firms were more than twice as likely to amend their past declarations than control firms. We show that the letters had both a direct effect on the treated firms and a spillover effect on their trading partners. However, the effects fade out after two months and there is no medium-term impact on overall reported VAT liability.

2. Research on behavioral responses to taxation

An important set of questions in public finance focuses on how economic agents respond to changes in tax rates and/or other elements of tax design. This branch of my research agenda aims to estimate empirically some key parameters that govern behavioral responses, such as elasticities, which are essential to evaluate the efficiency costs of taxation.

In the paper **"More giving or more givers? The effects of tax Incentives on charitable donations in the UK"** (Almunia, Guceri, Lockwood and Scharf, *Journal of Public Economics* 2020), we study how taxpayers respond to changes in the generosity of the tax incentives for charitable donations. To do this, we use the universe of self-assessment income tax returns filed by UK taxpayers in the period 2005-2013. We exploit variation from a large tax reform in 2010 to estimate intensive and extensive-margin tax-price elasticities of giving. Using an instrumental variables strategy, we find an intensive-margin elasticity of about −0.2 and an extensive-margin elasticity of −0.1, yielding a total elasticity of about −0.3. These estimates are on the lower part of the range of estimates obtained in a voluminous literature focusing on this parameter, which uses mainly US data (Bakija and Heim, 2011). To further explore the extensive-margin response, which had not been carefully estimated in the existing literature due to the difficulty of finding credible identification strategies in the US setting, we propose a model with a fixed cost of declaring donations. A structural estimation of the model provides an estimate of the fixed cost of around £47. We extend the classic theoretical framework to allow for extensive-margin responses and a fixed cost of reporting. Applying our estimates of the tax-price elasticities and the fixed cost to this model, we conclude that an increase in the generosity of the subsidy on charitable giving in the UK would be welfare improving.

Another parameter that has been heavily studied is the elasticity of taxable income (ETI). As shown by Feldstein (1999), under certain conditions the ETI is a sufficient statistic for the efficiency cost of taxation, and it is also a key parameter to estimate the revenue consequences of tax reforms. In **"The elasticity of taxable income in Spain: 1999-2014"** (Almunia & Lopez-Rodriguez, *SERIEs* 2019) we estimate the ETI using administrative tax-return data from Spain and exploiting variation from three large personal income tax reforms. Using a variety of estimation methods (Saez, Slemrod and Giertz, 2012; Kleven and Schultz, 2014; Weber, 2014), we estimate an ETI in the range between 0.45 and 0.64, which is robust to potential biases created by mean reversion and heterogeneous income trends. As predicted by theory, the estimated ETI is three

times larger for self-employed taxpayers than for employees and larger for business income than for labor and capital income. Lastly, the elasticity of gross income (EGI) is smaller, between 0.10 and 0.24, while the elasticity of some tax deductions such as the one for private pension contributions exceeds one. These results are useful to inform discussions about future income tax reforms in Spain, as the ETI is a key input to calculate the welfare impact and revenue effects of such reforms.

This part of my research agenda also studies how businesses respond to other tax design features besides tax rates. One important example is the VAT registration threshold. Since the VAT imposes relatively high-compliance costs on businesses, most countries exempt firms below a certain level of annual turnover from the obligation to register for VAT. In **"VAT Notches, Voluntary Registration, and Bunching: Theory and UK Evidence"** (Liu, Lockwood, Almunia & Tam, *Review of Economics and Statistics* 2021), we study firms' responses to the UK's VAT registration threshold. We develop a new conceptual framework with heterogeneous firms that allows simultaneously for bunching at the VAT registration threshold and voluntary registration by some firms below the threshold. The coexistence of these two responses seems paradoxical, because some firms try to avoid crossing this threshold (so as to not register for VAT) while others actively register for the tax even though they're not required to do so. Our general-equilibrium model identifies three key determinants of these behaviors. The model predicts that (a) higher intermediate input shares, (b) lower product-market competition and (c) a lower share of business to consumer sales (B2C) all lead to a higher probability of voluntary registration.

The intuition is as follows: regarding (a), firms that purchase inputs from VAT-registered firms benefit from registration because that allows them to claim credit on the input tax paid. Regarding (b), in a highly competitive market it is more difficult to pass the burden of output VAT onto buyers. Regarding (c), for firms whose customers are VAT-registered, the additional burden of the VAT can easily be passed on to clients in the form of a higher price, because they can claim back the input tax. The predictions on each of these dimensions are exactly the opposite for bunching at the registration threshold. We test the theory using linked administrative VAT and corporation tax records in the UK for 2004-2009, finding empirical support for the model's predictions. We also find suggestive evidence that bunching is mostly due to underreporting of sales, rather than real output responses. In the last part of the paper, we discuss the consequences of our results for the determination of the optimal level of the VAT registration threshold.

On a related ongoing project, I study the effects of other regulations affecting firm behavior. In **"The interaction effects of size-dependent regulations: evidence from Spain"** (joint with J.F. Jimeno, D. Lopez-Rodriguez and B. Petit) we study the combined effects of two size-dependent policies: labor regulations that only apply to firms with more than 50 employees and increased tax monitoring applied to firms with revenue above €6 million (the latter studied in Almunia and Lopez-Rodriguez, 2018). We document that there is moderate bunching of firms at the 50-employee threshold, while the is substantial bunching at the €6-million threshold. When looking at the joint distribution of employment and revenue, we show that there is complementarity

between these two policies and bunching is stronger on both dimensions as firms approach the two thresholds. We are currently developing a model of firm dynamics which can be calibrated to match key moments in the data. The next step will be to simulate counterfactual scenarios with alternative policies to estimate their impact on the firm size distribution and aggregate productivity.

3. Research on fiscal policy and aggregate demand shocks

In this part of my research agenda, I have studied the effects of fiscal policy at a more aggregate level, in particular estimating the multiplier of government spending, a key parameter in Keynesian models. I have also analyzed the impact of domestic demand shocks on firms' export behavior. Finally, I am currently working on a project that evaluates the consequences of the choice of alternative tax instruments in different economic settings.

In **"From Great Depression to Great Credit Crisis: similarities, differences and lessons"** (Almunia, Benetrix, Eichengreen, O'Rourke & Rua, *Economic Policy* 2010), we study the effects of fiscal and monetary policies during the Great Depression, using it as a historical benchmark for the Great Recession of 2008-09. We employ vector autoregressions (VAR), instrumental variables, and qualitative evidence for 27 countries for which data are available during the Great Depression (1925–39). The results suggest that fiscal stimulus was very effective on average, with a point estimate of 1.6 for the government spending multiplier. This paper contributed to a vibrant debate over fiscal multipliers in episodes of financial crisis, and our estimates are very close to estimates obtained by Blanchard and Leigh (2013) using data for the Great Recession. Our results are also consistent with the theoretical prediction of Keynesian models that the impact of fiscal stimulus is greater when banking systems are dysfunctional and monetary policy is constrained by the zero lower bound.

On another project, I study the effects of macroeconomic shocks on firm behavior at the microeconomic level. In **"Venting Out: Exports During a Domestic Slump"** (Almunia, Antras, Lopez-Rodriguez & Morales, *American Economic Review* 2021), we study the effects of a negative domestic-demand shock on the export behavior of firms. Specifically, we focus on the case of Spain, where exports experienced a boom in 2010-2013, a period in which the economy was in recession and suffering the effects of the sovereign debt crisis. We use transaction-level exports data merged with financial statement data at the firm level to study the differences in the export behavior of Spanish firms during a period of sustained economic growth, 2002-2008, and the Great Recession of 2009-2013. We exploit plausibly exogenous geographical variation in the reduction in domestic demand caused by the financial crisis. More concretely, we construct and instrument for firms' domestic sales based on a weighted average of the change in the stock of vehicles in the surrounding municipalities, where the weights are proportional to the population of the destination municipality and inversely proportional to the distance from the firms' location.

Using this instrumental variable strategy, we find a robust, within-firm negative causal relationship between demand-driven changes in domestic sales and export flows: firms whose domestic sales fell more sharply during the crisis observed a larger increase in their export flows. This negative relationship between domestic sales and export flows is at odds with the prediction of standard models of firms' export behavior which assume constant marginal costs (e.g., Melitz, 2003) and reflects the capacity of export markets to counteract the negative impact of local demand shocks. We develop an alternative theoretical framework with increasing marginal costs and us it to quantify the importance of this channel. The results indicate that the vent-for-surplus mechanism (first proposed by Adam Smith in *The Wealth of* Nations) explains about half of the Spanish export boom of 2009-2013.

In an ongoing research project titled **"The value-added tax: Theory and practice"** (joint with A. Brockmeyer, G. Mascagni, V. Nair & M. Waseem), we study the performance of the VAT in countries at different levels of economic development. To perform this analysis, we have gained access to micro-level administrative records from VAT returns for more than 10 countries in Africa, South Asia and Latin America. Despite its theoretical advantages over alternative tax instruments and its good performance in advanced economies, the VAT is plagued with implementation problems in low-income countries. We identify six stylized facts that pinpoint the features of low-income economies that make the VAT less effective at raising revenue and more distortionary in efficiency terms: (i) revenue is concentrated at the top, with the top 1% largest firms remitting 90% of VAT revenue; (ii) upstream firms (manufacturers) are much bigger than downstream firms (retailers), making the last-mile problem worse and opening the possibility of compliance unraveling from the bottom upwards; (iii) there is wide dispersion in the average effective VAT rate faced by firms of different sizes, implying that the tax introduces production inefficiency in contrast the theoretical predictions; (iv) the VAT chain is frequently broken due to noncompliance and informality, causing reductions in tax collection; (v) the distribution of reported VAT liability features bunching at zero, suggesting that there is widespread evasion also on the intensive margin; and (vi) to minimize losses from evasion, revenue authorities limit VAT refunds using ad-hoc rules, causing liquidity problems to some firms that legitimately request refunds (e.g., exporters or new firms).

4. Research on other topics

In this last section, I describe some other work that I have conducted in different topics, including gender imbalances across fields in economics research and the use of administrative data for research.

In **"Are Men and Women-Economists Evenly Distributed Across Research Fields? Some New Empirical Evidence"** (Dolado, Felgueroso & Almunia, *SERIEs* 2012), we analyze the gender distribution of research fields in economics, based on a dataset of almost 1,900 researchers affiliated to top-50 economics departments. We document that women are unevenly distributed across fields within economics and test some behavioral implications from theories underlying such disparities. Our main findings are that the probability that a woman works on a given field

is positively related to the share of women already working on that field (path-dependence), and that this phenomenon is better explained by women avoiding male-dominated fields than by men avoiding female dominated fields. This pattern, however, is weaker for younger female researchers, who spread more evenly across fields.

Given the importance of the use of data administrative records for my own research, and the unequal availability of such data across countries, I have written some conceptual papers on this issue that have been published in peer-reviewed journals. In **"Expanding access to administrative data: the case of tax authorities in Finland and the UK"** (Almunia, Harju, Kotakorpi, Tukiainen and Verho, *International Tax and Public Finance* 2019), we discuss common issues in getting access to and using high-quality administrative tax data for research purposes. We reflect on practical solutions that promote co-creation of knowledge and reduce information asymmetries between researchers and practitioners, based on our experiences of working with the tax authorities in Finland and the UK. We discuss in detail two successful case studies: the HMRC Datalab in the UK and the remote access to data from Statistics Finland. We propose two key arguments to persuade policymakers elsewhere to follow similar practices: improved data security and equality of access across researchers. In **"The Management of Administrative Data in Spain: Diagnosis and Challenges"** (Almunia and Rey-Biel, *Cuadernos Económicos de ICE* 2021), we do a comparative analysis of the conditions for accessing administrative data for research in several European countries. We conclude that Spain lags behind most of its neighbors on this matter and present proposals for how the Spanish government can provide data access to the research community in a safe and efficient way to stimulate more research on the effects of public policies in Spain.

References to my Research Papers

Almunia, Miguel, Pol Antràs, David López-Rodríguez and Eduardo Morales (2021): "Venting Out: Exports during a Domestic Slump", *American Economic Review,* vol. 111(11), p. 3611-3662. D.O.I.: https://doi.org.10.1257/aer.20181853.

Almunia, Miguel, Agustín Bénétrix, Barry Eichengreen, Kevin O'Rourke and Gisela Rua (2010): "From Great Depression to Great Credit Crisis: Similarities, Differences, and Lessons", *Economic Policy*, vol. 25 (62), April 2010, pp. 219–265. D.O.I.: https://doi.org.10.1111/j.1468-0327.2010.00242.x.

Almunia, Miguel, Irem Guceri, Benjamin Lockwood and Kimberley Scharf (2020): "More Giving or More Givers? Tax Incentives and Charitable Donations in the UK", *Journal of Public Economics*, vol. 183, Mar 2020, 104114. D.O.I.: https://doi.org.10.1016/j.jpubeco.2019.104114.

Almunia, Miguel, Jarkko Harju, Kaisa Kotakorpi, Janne Tukiainen and Jouko Verho (2019): "Expanding Access to Administrative Data: The Case of Tax Authorities in Finland and the United Kingdom", *International Tax and Public Finance*, vol. 26 (3), June 2019, pp. 661-676. D.O.I.: https://doi.org.10.1007/s10797-018-9525-0.

Almunia, Miguel, Jonas Hjort, Justine Knebelmann and Lin Tian (2021): "Strategic or Confused Firms? Evidence from Missing Transactions in Uganda", *Review of Economics and Statistics*, forthcoming.

Almunia, Miguel and David Lopez-Rodriguez (2018): "Under the Radar: The Effects of Monitoring Firms on Tax Compliance", *American Economic Journal: Economic Policy*, vol. 10 (1), Feb 2018, pp. 1-38. D.O.I.: https://doi.org.10.1257/pol.20160229.

Almunia, Miguel and David Lopez-Rodriguez (2019): "The Elasticity of Taxable Income in Spain: 1999-2014", *SERIEs - Journal of the Spanish Economic Association*, vol. 10(3), Nov 2019: 281-320. D.O.I.: https://doi.org.10.1007/s13209-019-00208-x.

Dolado, Juan J., Florentino Felgueroso and Miguel Almunia (2012): "Are Men and Women-Economists Equally Distributed Across Research Fields? Some New Empirical Evidence", *SERIEs - Journal of the Spanish Economic Association*, vol. 3 (3), Sep 2012, pp. 367-393. D.O.I.: https://doi.org.10.1007/s13209-011-0065-4.

Liu, Li, Benjamin Lockwood, Miguel Almunia and Eddy Tam (2021): "VAT Notches, Voluntary Registration and Bunching: Theory and UK Evidence", *Review of Economics and Statistics*, vol. 103, Mar 2021, 151-164. D.O.I.: https://doi.org.10.1162/rest_a_00884.

References to Papers by Other Authors

Abowd, John, Francis Kramarz and David Margolis (1999): "High wage workers and high wage firms", *Econometrica* 67(2): 251-333.

Bachas, Pierre, Roberto N. Fattal Jaef, and Anders Jensen (2019): "Size-dependent tax enforcement and compliance: Global evidence and aggregate implications." *Journal of Development Economics* 140: 203-222.

Bakija, Jon, and Bradley Heim (2011): "How does charitable giving respond to incentives and income? New estimates from panel data." *National Tax Journal* 64 (2): 615–750.

Blanchard, Olivier and Daniel Leigh (2013): "Growth forecast errors and fiscal multipliers." *American Economic Review*, 103(3), 117-20.

Feldstein, Martin (1999): "Tax Avoidance and The Deadweight Loss of Income Taxation." *Review of Economics and Statistics*, 81(4): 674–680.

Kleven, Henrik, Esben Schultz (2014): ·Estimating taxable income responses using Danish tax reforms." *American Economic Journal: Economic Policy* 6(4):271–301.

Kleven, Henrik, and Mazhar Waseem (2013): "Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence from Pakistan." *Quarterly Journal of Economics,* 128(2): 669–723.

Melitz, Marc (2003): "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity." *Econometrica* 71(6):1695–1725.

Pomeranz, Dina (2015): "No Taxation Without Information: Deterrence and Self-Enforcement in the Value-Added Tax." *American Economic Review*, 105(8): 2539–2569.

Saez, Emmanuel (2010): "Do Taxpayers Bunch at Kink Points?" *American Economic Journal: Economic Policy*, 2(3): 180–212.

Saez, Emmanuel, Joel Slemrod and Seth Giertz (2012): "The elasticity of taxable income with respect to marginal tax rates: a critical review." *Journal of Economic Literature* 50(1):3–50.

Weber, Caroline (2014): "Toward obtaining a consistent estimate of the elasticity of taxable income using difference- in-differences." *Journal of Public Economics* 117:90–103.