Toward a Signaling Account of Voluntary Value-Added Tax Registration

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Abstract. In value-added tax ("VAT") statutes around the world, an election that allows small firms with lower sales to register voluntarily for the VAT is a key design element. Recently, a novel explanation for a small firm's choice to register voluntarily for VAT has surfaced: it may view voluntary registration as a way to secure reputational advantages (or avoid reputational harm). This paper explores such an account using the broad outlines of Spence's costly signaling model (1973). Like the use of education by a job-seeker to convey private information about her productivity to potential employers, might voluntary VAT registration by an entrepreneur act as a signal of her firm's quality to potential trading partners? Applying existing VAT theory, the answer would seem to be no. The "formality chain effects" model shows that voluntary registration is *profitable* (not costly) for small firms that trade with other VAT-registered businesses. The thesis of this paper is that the two accounts can coexist. For small firms that are not embedded in formal supply chains, voluntary registration is indeed a costly step. For these firms, those with lower costs of voluntary registration may be of higher quality. First, propensity to register voluntarily may correlate with the entrepreneur's business sophistication or prior business experience, which may correlate with future success. Second, it may correlate with the entrepreneur's intrinsic commitment to legal compliance, which is often valuable to counterparties. Third, it is likely to correlate with expectations for rapid growth. The paper concludes by considering the policy implications of a signaling account of voluntary registration.

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Introduction

     "Register to pay taxes that are not legally required" seems an unlikely entry on the to-do list of a fledgling businessperson or emerging entrepreneur.[1] Might an entrepreneur voluntarily register for an "optional tax" as a way of conveying information to others about the quality or reputation of the business's product, or its legitimacy?[2] In the particular context of a value-added tax ("VAT"),

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[1] More pointedly, recent research on structural barriers to incentivizing innovation has focused on the reverse phenomenon: new firms often decline to pursue tax-minimizing planning strategies even if such planning has positive expected net present value. See Susan Morse and Eric Allen, Innovation and Taxation at Start-Up Firms, 69:3 Tax L. Rev. 357, 383 (2016) (proposing that, under assumptions consistent with empirical data, "a capital-constrained firm such as a start-up does not think about investing in tax planning as a project of identifying all tax planning investments with positive net present value. Rather, because such a firm must operate with a limited endowment, it trades off the likely benefits of a possible investment in tax planning against the disadvantage of having less to spend on business investment").

[2] The context in which small businesses respond to an explicit (and very clear) choice in the law about "joining" a tax system is distinguishable from that facing larger, more disruptive firms considering whether to affirmatively embrace tax reporting as part of a larger public relations and regulatory compliance strategy. See, e.g., Shu-Yi Oei and Diane M. Ring, The Tax Lives of Uber Drivers: Evidence from Internet Discussion Forums, 8 Colum. J. Tax L. 56, 65 (2017) (noting the voluntary shift into more stringent information reporting of ride-sharing behemoth Uber: "Lyft has taken the position that it is a 'third party settlement organization' only required to report payments above the $200,000/200 transactions threshold. Uber took this position until early 2015, but then began issuing Form 1099-K to drivers for all driving payments, no matter how

which requires registrants to charge VAT on their sales but provides refunds for the VAT they pay when purchasing inputs, the proposition that a small business might voluntarily register to participate in an otherwise optional tax system for the purpose of conveying information—as part of its "brand," in a sense—has not been considered in any depth.[3] This paper assesses the viability of such a proposition. More specifically, it explores the applicability of Michael Spence's (1973) education signaling model to the phenomenon of voluntary VAT registration by small business entrepreneurs.[4]

The above paragraph raises a number of questions.[5] First, the signaling account itself: is there any evidence that real-world businesses think about VAT registration as a signal? Second, what *is* voluntary VAT registration? Third, why would a revenues-attentive government offer a tax "option" to exempt small businesses, and under what circumstances (if any) might it be exercised? Finally, even if voluntary VAT registration by a small business entrepreneur might function as an informational signal, why might policymakers care?

Answering these questions is central to the paper's task of developing and interrogating an informational account of voluntary VAT registration. Thus, Part I starts with my motivation for the signaling inquiry: it summarizes the findings of some recent empirical research addressing the considerations of small business entrepreneurs in deciding to voluntarily register. Part II provides background on why voluntary registration may be advantageous to small businesses under certain circumstances. Part III turns to the signaling account by describing the requirements and implications of Spence's education-productivity model. Part IV investigates how a small business entrepreneur's choice to voluntarily register might (or might not) mesh with the signaling model. In particular, it argues that foregrounding the practical problem of compliance costs can help resolve the apparent inconsistency between the VAT literature's standard account of voluntary registration and this paper's signaling account. Part V concludes by offering two conjectures on the possible policy implications of a signaling account.

Part I. Motivation: why signaling?

Currently, no empirical studies have set out to test the hypothesis that small business entrepreneurs use VAT registration as an informational signal; that is, that they register to indicate to counterparties that they are reputable, trustworthy, or generally of high quality.[6] However, hints that voluntary VAT registration may play such an informational role have surfaced in two recent survey-based studies of small business VAT compliance. Another has appeared in the writing of a leading VAT economist.

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   [3] See Pierre-Pascal Gendron, Real VATs vs. the Good VAT: Reflections From a Decade of Technical Assistance, 32 Austl. Tax Forum 257, 268 (2017) (discussed infra).

   [4] See Michael Spence, Job Market Signaling, 87 Quarterly Journal of Economics 355 (1973) (modeling education acquisition by future job-seekers; assuming that "individuals…select signals (for the most part, I shall talk in terms of education) so as to maximize the difference between offered wages and signaling costs").

   [5] See Ian Crawford, Michael Keen and Stephen Smith, Value Added Tax and Excises, Mirrlees Report (2010) (offering a highly readable primer on key VAT design issues).

   [6] The two surveys discussed herein were not designed to shed light on this specific hypothesis.

In the first study, researchers commissioned by the United Kingdom's tax authority surveyed over two thousand businesses to learn about their VAT registration and compliance experiences.[7] Among the businesses that had voluntarily registered for VAT, approximately twenty percent identified "[i]mproved reputation/credibility/image" as one of the "benefits of registering."[8] The report also noted that, according to follow-up qualitative surveys of some of the participants, "VAT registration was said to make a company look larger, more established and more stable."[9] The report did not make any claims about the statistical significance of this "improved reputation" factor, nor did it shed light on whether the factor was decisive in participants' decision-making about voluntary registration. Nonetheless, it suggests that voluntary VAT registration may play an informational role for some UK small supplier entrepreneurs.

In the second empirical study, which occurred simultaneously but without knowledge of the UK study, this author conducted a survey of ninety-eight small business entrepreneurs in Ontario during the 2016-17 academic year. Eligibility was restricted to businesses that qualified in one of the three most recent years as a "small supplier" pursuant to the definition in the Canadian federal VAT statute (the "Goods and Services Tax," or GST), which roughly corresponds to having less than $30,000 in sales during any rolling four-quarter period.[10] Survey participants answered a series of quantitative and qualitative questions about their business and their views about voluntarily registering; these yielded a number of unprompted responses that echoed those from the UK study.[11] For example, one unregistered participant stated that she had considered voluntarily registering her enterprise "to make it seem like a more official business."[12] This was similar to the response of a voluntarily-registered participant, who explained, "I wanted to look more official."[13] Another

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[7] See Rebecca Klahr, Lucy Joyce, Rory Donaldson, Graham Keilloh, and Cheryl Salmon, Behaviours and experiences in relation to VAT registration: final report, HM Revenue and Customs Research Report Number: 446 (Ipsos MORI Social Research Institute: November 2017), at 7, 21-29 (surveying 604 unregistered businesses, 761 voluntarily-registered businesses, and 644 mandatorily-registered businesses; noting that unregistered businesses were "[b]usinesses that are not registered for VAT and whose turnover was up to £7,000 below the VAT threshold in 2012/13 and 2013/14 (referred to throughout as 'unregistered borderline businesses')).

[8] Id. at 28. The study also reported, with respect to all registered businesses (those who registered voluntarily and those who registered because it was required), that "while fewer than one in five VAT registered businesses spontaneously mentioned benefits to their image and reputation, around seven in ten when prompted agreed that being registered has improved their business image." Id. at 29.

[9] Id. at 22.

[10] See Excise Tax Act, RSC 1985, c. E-15, as amended (hereinafter "GST") and GST Amending Act 1993, c. 27, s. 23; 1997, c. 10, s. 148 (definition of "small supplier");

[11] See Emily Satterthwaite, "Electing into a Value-Added Tax: Survey Evidence from Ontario Microentrepreneurs," forthcoming, Canadian Tax Journal (draft dated November 5, 2018) (reporting that "6 participants (6 percent of the full sample) mentioned this factor;" noting breakdown as "(5 percent of all registered participants; 7 percent of all unregistered participants) [in the 98-participant survey]"). Survey data from this study is on file with author and cited herein with reference to specific participants' responses ("Survey Participant #X").

[12] Survey Participant #1001.

[13] Survey Participant #1005.

unregistered participant shared her desire to voluntarily register in the future, and stated that registering would make her business look "more professional, and is the way things should be."[14] A second voluntarily-registered participant declared that he decided to register because it "shows you are a legitimate business."[15] Others had similar responses.[16]

In addition to the two surveys, a recent academic article by economist Pierre-Pascal Gendron reflected on lessons learned from his VAT technical assistance work in numerous developing countries over the past decade. Gendron notes, as part of his discussion of small business VAT compliance issues, that "a supplier that is VAT-registered may signal to clients that it runs a legitimate and reputable business."[17] He does not elaborate further on this idea in the article, but the statement suggests that his direct experience assisting governments in their adoption of VATs corresponds, at least to some degree, to the signaling notion.

These are, indeed, just hints. The empirical significance of signaling as a factor relative to others in a small business entrepreneur's decision-making about registering voluntarily in any particular VAT jurisdiction is beyond the scope of this paper. However, it proceeds on the assumption that these hints are sufficient to warrant a theoretical exploration of signaling, which may bear independently interesting fruit and, perhaps, plant the seeds for future empirical work.

Part II. Background: what is voluntary registration and why offer it?

For readers who may be less familiar with VAT mechanics, the first order of business is some nomenclature. The above-noted $30,000 figure that appears in Canada's GST statute is known more generally as a "registration threshold," and the overwhelming majority of VAT statutes have one.[18] They determine which businesses (usually, those with annual taxable supplies/sales less

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[14] Survey Participant #1022.

[15] Survey Participant #1034.

[16] See Satterthwaite, supra note 11, at 38-39.

[17] See Gendron, supra note 3, at 268.

[18] See IMF Tax Policy Assessment Framework, available at: https://www.imf.org/en/Data/TPAF; see also Crawford et al., supra note 5, at 299; Smulders and Evans, supra note 19, at 293-94 (noting that "[o]f the 34 OECD countries with a VAT, 28 have set a threshold under which small businesses do not register for the tax").

than a given threshold[19]) qualify as presumptively-exempt "small suppliers."[20] Small suppliers are not required to register, but in many jurisdictions they are allowed to do so voluntarily.[21] This typically means that they would take the same steps in the same manner as would a larger business for which registration is mandatory.[22] Such steps often include applying for a GST number with the tax agency, keeping track of their sales and expenses to calculate their GST liability, filing returns at the appropriate intervals, etc.

The consensus among VAT economists that "arrangements for…voluntary registration are a key part of any well-designed VAT" is illustrated by language in the recently-released VAT Module of the IMF's Tax Policy Assessment Framework, which states: "[a] best practice system also allows for voluntary VAT registration of businesses falling under the threshold, provided these businesses are able to maintain reliable books of account substantiating their transactions."[23] But before explaining the main reasons cited for this view, the very existence of a registration threshold requires some explanation. Why have a registration threshold in the first place?

The registration threshold relates to the key improvement that the VAT makes over other kinds of consumption taxes, such as turnover taxes. This improvement is the "invoice credit" mechanism, in which "registered businesses offset the VAT they have been charged on their purchases ('input

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[19] Nearly all refer to taxable supplies/turnover for a specified period. See Kathryn James, The Rise of the Value-Added Tax (2015), at 57. However, there is considerable variation in the design of registration thresholds. Id. (describing two common forms). For instance, some are measured with regard to net VAT due rather than annual taxable turnover. See Consumption Tax Trends 2018: VAT/GST and Excise Rates, Trends and Policy Issues, OECD Publishing, Paris (2018) https://doi.org/10.1787/ctt-2018-en. Others require registration for all firms but do not impose VAT liability until a threshold is exceeded. See James, id. at 57. Many countries, including China, use a "threshold," but rather than exempting all small firms with revenues below the threshold, impose an alternative system of taxation, such as a turnover tax, for a subset of small firms. See Alan Schenk, Victor Thuronyi, and Wei Cui, Value Added Tax: A Comparative Approach (2015), at 449 ("[t]he choice of terminology aside, China is not unique in separating traders into three groups: the smallest firms that are categorically exempt from the VAT; somewhat larger firms that are subject to a "special regime" intended to generate lower administrative and compliance costs per taxpayer than regular VAT compliance; and a final group of firms that are subject to regular VAT mechanisms").

[20] See Sharon Smulders and Chris Evans, Mitigating VAT compliance costs – a developing country perspective, 32 Australian Tax Forum 283, 295 (2017) ("while not being in the VAT regime might sound attractive, the choice is not always obvious, as there can be benefits of VAT registration…virtually all countries with thresholds allow small businesses to register for the VAT if they so choose").

[21] See, for example, Canada Revenue Agency website, which states as part of a table describing the registration rules: "You do not have to register. You may choose to do so voluntarily if you provide taxable supplies in Canada," available at https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/gst-hst-businesses/register-a-gst-hst-account.html#Voluntary (emphasis and hyperlinks in original).

[22] See BRO ("Business Registration Online") system offered by Canada Revenue Agency to facilitate GST/HST registration and other tax tasks; available at: https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/registering-your-business/business-registration-online-overview.html]

[23] See Crawford et al., supra note 5, at 296; IMF TPAF, supra note 18.

VAT') against the liability ('output VAT') on their sales, remitting only the net amount due."[24] By allowing businesses—assuming, crucially, that they have registered for the VAT—to claim a refundable credit for their input VAT, the VAT succeeds in taxing only the final consumption of individuals when they consume goods and services (at the "retail" level). Input-crediting thus avoids the nefarious "tax cascade" that can distort prices depending on the point in a chain of production at which a sale is made.[25] Put differently, an invoice credit VAT, by *not* taxing intermediate business-to-business transactions, promotes one of the holy grails of consumption tax design: "production efficiency." This is the principle, formalized by the Diamond-Mirrlees production efficiency theorem, that "any distortions of production decisions reduce aggregate output, which cannot be wise so long as there is some useful purpose to which that output could be put."[26]

But what about the obvious rejoinder: does not the virtue of production efficiency require that *all* businesses in the chain of production be part of the VAT system? Indeed, if a sale is made by a business—such as a small supplier—that is unregistered, its input VAT will, by definition, cascade into the price of its output.[27] Registration thresholds and their corresponding exemption of small suppliers are thus fundamentally incompatible with the production efficiency of a VAT. Moreover, they violate the norm of avoiding discontinuous "notches" that create incentives for taxpayers to remain—through legal or illegal means—just outside the tax system. In the context of registration thresholds, the incentive to remain "small" (and thus exempt) looms large.[28] VAT theory argues, and recent empirical evidence has confirmed, that the presence of a registration threshold results in significant "bunching" by firms below the threshold. The real-world efficiency costs of bunching are a significant VAT policy concern.[29]

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[24] See Crawford et al., supra note 5, at 292 (noting that input crediting represents the key structural improvement of a VAT over its predecessors, such as general sales taxes that required sellers to collect tax on every transaction in every stage of production).

[25] See Schenk et al., supra note 18, at 2-5 (explaining how early VATs were guided by the "principle…[of] reduc[ing] the tax on sales by the tax already paid on business inputs to avoid the tax-on-a-tax [cascade] effect and to remove the incentive to vertically integrate a business"). The rationale for input-crediting is to avoid such efficiency-reducing "tax cascades" or a-tax-paid-on-a-tax. In a tax cascade, downstream buyers get "stuck" with part or all of the embedded cost of tax paid on inputs.

[26] Crawford et al., supra note 5, at 292 (they precede this statement by noting "[a]ssuming that there are no restrictions on the government's ability to make transfers"—this is important, but not for our discussion).

[27] See Michael Keen and Stephen Smith, VAT Fraud and Evasion: What Do We Know and What Can Be Done?, 59 Nat'l Tax J. 861, 863 (Dec. 2006) ("[e]xemption in contrast means that no tax is due on output, nor is a credit available for input VAT. Thus, the VAT 'sticks' on business purchases; the Australian term 'input-taxed' is more evocative"). This input tax "stickiness" distorts prices on the basis of the location of a product in the supply chain and creates incentives to self-supply inputs rather than purchasing them at arms-length. See Schenk, supra note 23, at 2-5 (explaining how early VATs were guided by the "principle…[of] reduc[ing] the tax on sales by the tax already paid on business inputs to avoid the tax-on-a-tax [cascade] effect and to remove the incentive to vertically integrate a business").

[28] See discussion in Satterthwaite, supra note 11 at 4 (explaining these bunching responses as resulting from strategies that "include curtailing sales to stay artificially small, splitting one firm into two or more firms, and keeping some revenues out of sight of the tax authorities") (citations omitted).

[29] A number of studies have found significant behavioural responses by firms to the discontinuity created by a VAT registration or compliance-related threshold. *See* Kazuki Onji, *The Response of Firms to Eligibility*

But all this merely underscores the original concern: registration thresholds seem like a terrible idea. However, the explanation for their ubiquity stems from another empirical fact about real-world VATs: they have turned out to be less hassle-free than VATs in theory.[30] As Richard Bird and Pierre-Pascal Gendron comment, "the ideal VAT threshold was [thought to be] zero. As time went on, however, and more experience with the difficulties of imposing general sales taxes in fragmented economies with large informal sectors accumulated, conventional wisdom changed. It now suggests that a threshold should be set considerably higher in most countries…"[31]

This now-conventional (but not uncontested, as the UK study cited in Part I indicates) wisdom emerged from the insights of a theoretical model of optimal VAT thresholds that was published in 2004 by Michael Keen and Jack Mintz.[32] With respect to small businesses, the model suggests that the universal-registration cure may be worse than the production-inefficiency disease that the VAT was designed to address.[33] One of the model's parameters is a business's cost of VAT compliance. Studies have found this cost to be non-trivial in absolute and relative terms, especially for smaller businesses that have scarce revenues to cover the costs of compliance.[34] The model also relies on

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Thresholds: Evidence from the Japanese Value-Added Tax, 93 J. OF PUB. ECON. 766, 771-73 (2009) (finding significant disparities of the densities of firms around the Japanese threshold between the standard VAT regime and a concessional "simplified filing scheme" for small suppliers; concluding that such findings are consistent with large firms masquerading as smaller firms through changes in organizational structure but not underlying economic activities); *see* Li Liu & Ben Lockwood, *VAT Notches* (CESifo Working Paper No. 5371, Sept. 1, 2016), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2615702 [https://perma.cc/RS73-WELQ] (documenting bunching below the UK VAT's registration threshold); *see* Jarkko Harju, Tuomas Matikka & Timo Rauhanen, *The Effects of Size-Based Regulation on Small Firms: Evidence from VAT Threshold* 1, 3 (CESifo Working Paper No. 6115, Sept. 2016), https://www.econstor.eu/bitstream/10419/147369/1/cesifo1_wp6115.pdf [https://perma.cc/47CP-KJN44CBC-9K72] (using data from the VAT in Finland to show that the "threshold causes a large and significant overall behavioral response. We find large excess mass of firms in the sales distribution just below the threshold, implying that small firms actively avoid VAT liability…Our results strongly indicate that compliance costs are the key factor in explaining the observed behavior").

[30] See James, supra note 18 at [add pin] (providing context for this observation and its potentially profound implications for explaining the rise of the VAT).

[31] See Richard Bird and Pierre-Pascal Gendron, The VAT In Developing And Transitional Countries 115 (2007). They note a rule-of-thumb amount of about $100,000; however, the inflation-adjusted rule-of-thumb threshold would be significantly higher.

[32] See also Michael Keen and Jack Mintz, The Optimal Threshold for a Value-Added Tax, 88 J. Pub. Econ. 559 (2004) (offering a general equilibrium theory addressing the "efficiency concerns" that arise from "potential distortions arising from the differential treatment of those above and below the threshold…The common concern is that those below the threshold will be placed at a competitive advantage relative to those above").

[33] Id., at 564 and 565-8.

[34] See Luca Barbone, Richard M. Bird and Jaime Vazquez-Caro, The Costs of VAT: A Review of the Literature, CASE Network Reports No. 106/2012, at 15 (finding "[t]he regressivity of the compliance burden of taxation, and VAT in particular, which can be taken as definitively established in the literature, in particular stems from the large diseconomies of scale involved in complying with tax requirements, together with the learning curve effect that militates strongly against small firms"). See also Bird and Gendron, supra note 31,

evidence that the per-business costs to tax agencies of administering and enforcing the VAT are high and, in the case of smaller businesses, often cannot be justified by the VAT revenue at stake.[35] A number of sources cite a "rule of thumb" gleaned from across VAT jurisdictions, which relates firm size to VAT revenue: the top 10 percent of firms by size generate approximately 90 percent of VAT revenue.[36] Keen and Mintz's model of the optimal registration threshold acknowledges that production efficiency is sacrificed by exempting small firms, but that it would be worse—in terms of the magnitude and distribution of compliance and administration/enforcement costs—to mandate that they register.

The policy evolution of optimal registration thresholds thus elevates the importance of the question "why offer voluntary registration?": a higher threshold implies that more businesses will have this option. The answer relates directly to the dynamics discussed above: the mechanism of voluntary registration, by allowing (weakly) more firms to be part of the VAT system, reclaims some of the production efficiency that is lost from exempting small suppliers. It acts as a structural complement to *having* a registration threshold in the first place. And, in countries with a (non-zero) registration threshold, offering voluntary registration is exceedingly common.[37]

This sketch of the basics of an invoice-credit VAT is intended to provide background for assessing the viability of a signaling account of voluntary registration. However, one of the questions posed in the introduction remains unanswered: why would a small supplier find it advantageous to

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at 120 (summarizing empirical findings as universally consistent with compliance cost regressivity).

[35] See Keen and Mintz, supra note 32, at 564.

[36] See Liam Ebrill, Michael Keen, Jean-Paul Bodin and Victoria Summers, The Modern VAT 115, 117-18 (2001) ("[i]n most countries, a surprisingly small number of VAT registrants, sometimes less than a few dozen, account for 80% or 90% of VAT collections…[d]espite significant variation, a useful rule of thumb is that the largest 10 percent of all firms commonly account for 90 percent or more of all turnover…This seemingly universal feature has important implications for the relationship between the threshold and the tax base: starting from a low level, a \$1 increase in the threshold is initially very cheap in terms of revenue foregone, but becomes much more expensive at higher levels of turnover;" noting, however, that there is "significant variation" across jurisdictions in the concentration of revenue across the distribution of firms…[but] at least 88 percent of turnover occurs in the largest 10 percent of firms"). See also Bird and Gendron, supra note 31, at 115 ("[i]n most [developing and transitional] countries, a surprisingly small number of VAT registrants, sometimes less than a few dozen, account for 80% of 90% of VAT collections"); Keen and Mintz, supra note 32, at 573-74 (noting that "in practice, the concentration of activity amongst a relatively few enterprises is such that it is indeed often the case that even a relatively high threshold catches an extremely large proportion of the potential base").

[37] See Smulders and Evans, supra note 19, at 295 ("while not being in the VAT regime might sound attractive, the choice is not always obvious, as there can be benefits of VAT registration…virtually all countries with thresholds allow small businesses to register for the VAT if they so choose"). Exceptions to the rule of allowing voluntary registration exist in Israel, Korea and the Netherlands. See Consumption Tax Trends 2016: VAT/GST and excise rates, trends and policy issues, OECD Publishing, Paris, at 89, available at https://doi.org/10.1787/ctt-2016-en. See also IMF TPAF, supra note 18 ("VAT laws in some countries also specify a minimum threshold under which voluntary registration is not allowed").

exercise the option to register voluntarily? Put differently, production efficiency might well improve social welfare by promoting aggregate efficiency, but what about private costs and benefits that, on the margin, influence the decisions of a resource-constrained small business entrepreneur? To answer this question, Part IV returns to the existing literature on VAT mechanics to sketch out the "formality chain effect" account of voluntary registration. However, before engaging with that account and the ways in which it presents a challenge for the signaling story, Part III outlines the latter with reference to Spence's education-productivity model.[38]

Part III: The signaling model

A. Information asymmetry

A background setting of asymmetric information is a prerequisite for any conversation about signaling. In Spence's model, information asymmetry exists among various participants in the market for human talent. In particular, there is a buyer (employer) and a group of sellers (job applicants). The employer, who needs to hire workers, cannot observe the quality-types of the applicants, where quality is measured by productivity.[39] Under the simplifying assumption that there are applicants of only two types—high-quality and low-quality—the profit-maximizing employer will seek to offer a wage that matches the quality-type of the applicant. But, because of asymmetric information, the employer cannot differentiate among applicants, and so cannot offer a high wage to the high-quality applicant and vice-versa. In such a circumstance, the employer's best response is to split the difference (so to speak) by offering every applicant an average wage.[40] However, this causes an "unraveling" problem: high-quality workers will not accept the wage, and will never match with the employer. The employer knows this, so will offer only a low wage; as a result, it will be able to hire only low-quality workers. Absent the signaling magic that is described immediately below, high-quality job applicants can be expected to leave the market in exasperation, poverty, or some combination thereof.

B. Attributes of a viable signal

1. Requirement 1: Costliness

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[38] See Spence, supra note 4, at 358 (modeling education acquisition by future job-seekers; assuming that "individuals…select signals (for the most part, I shall talk in terms of education) so as to maximize the difference between offered wages and signaling costs"). For applications of Spence's costly signaling model to legal choices, see William H.J. Hubbard, Costly Signaling, Pleading and Settlement, Coase-Sandor Institute for Law and Economics Working Paper (April 2017); Edward Iacobucci, Toward a Signaling Explanation for the Private Choice of Corporate Law, 6 Am. Law and Econ Rev. 319 (2004).

[39] Spence, supra note 4, at 356 ("[i]n most job markets the employer is not sure of the productive capabilities of an individual at the time he hires him…Nor will this information necessarily become available to the employer immediately after hiring. The job may take time to learn. Often specific training is required. And there may be a contract period within which no recontracting is allowed…hiring is an investment decision" made under conditions of uncertainty).

[40] Id. ("[t]o hire someone, then, is frequently to purchase a lottery").

Spence defines a "signal" as something that can be influenced—at a cost—by an individual.[41] "Cost" is construed liberally, and "[s]ignaling costs [can] include psychic and other costs, as well as direct monetary costs.[42] One element of cost, for example, is time."[43] In addition, signals must be relevant to how the signal's recipient (the employer, in Spence's setting) views the signaler. That is, the signal must convey something about the signaler's quality, in the particular sense that it must influence whether the recipient of the signal wants to form a cooperative or contractual relationship with the signaler.[44]

In Spence's employment context, this means that the signal must be relevant to the employer in determining the wage offered to a given applicant.[45] A signal will have value if it can help the employer update, over successive hiring rounds, its beliefs about the applicant's quality to allow it to offer the appropriate (high versus low) wage. In an equilibrium, the employer's beliefs and the wage schedule become "self-confirming."[46] Spence describes this iterative process as follows: "an equilibrium can be thought of as a set of employer beliefs that generates offered wage schedules, applicant signaling decisions, hiring and ultimately new market data [based on *ex post* observed productivities] over time that are consistent with the [employer's] initial beliefs."[47]

2. Requirement 2: cost of signal varies inversely with quality

Once it is clear that the putative signal is costly, to get to an equilibrium that allows *both* high- and low-quality applicants to be matched with appropriate wages, a second requirement must be met: the cost of sending the signal must vary inversely with the applicant's quality.[48] The intuition is that the easier a signal is to send for an applicant, the stronger and more revealing it will be upon receipt by the employer. Spence offers the possibility that education may work as a signal by observing that education may be less costly to obtain for high-quality types.[49] Here, it is important to note that, in

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[41] A signal stands in contrast to an "index," which is an immutable characteristic that cannot be influenced at any cost (or is pre-determined, like age). Id. at 357 (explaining in the job applicant-potential employer context, "I shall refer to observable, unalterable attributes as indices, reserving the term signals for those observable characteristics attached to the individual that are subject to manipulation by him").

[42] Id. at 358 ("[s]ignaling costs play a key role in this type of signaling situation").

[43] Id. at 359.

[44] Id. at 357 ("[o]f those observable, personal attributes that collectively constitute the image the job applicant presents, some are immutably fixed, while others are alterable…signals and indices are to be regarded as parameters in shifting conditional probability distributions that define an employer's beliefs").

[45] Id. at 357-8 ("[o]n the basis of previous experience in the market, the employer will have conditional probability assessments over productive capacity given various combinations of signals and indices. At any point of time when confronted with an individual applicant with certain observable attributes, the employer's subjective assessment of the lottery with which he is confronted is defined by these conditional probability distributions over productivity given the new data").

[46] Id. at 360.

[47] Id.

[48] Id. at 358 ("[i]t is not difficult to see that a signal will not effectively distinguish one applicant from another, unless the costs of signaling are negatively correlated with productive capability").

[49] Id. at 357 (noting that "education is something that the individual can invest in at some cost in terms of time and money").

Spence's formulation, the *only* function of education is as a signal. Learning plays no role in the model: education does not augment the underlying productivity of either type of applicant, as its sole purpose is informational.[50]

In the model, each applicant-type seeks to maximize the difference between her offered wage and her cost of education.[51] A applicant will invest in education only if its net benefits are positive, which will occur if the difference between the average wage she will be offered with no signaling and the high wage she will be offered with signaling exceed her cost of obtaining education. A signaling equilibrium that separates high-quality and low-quality applicants emerges when it is beneficial only for high-quality applicants (but not low-quality applicants) to invest in education. This will be the case when, for a low-quality applicant, the cost of investing exceeds the wage-differential benefit from mimicking the high-quality applicant.[52] Under such circumstances, over many successive rounds of hiring, the employer's beliefs about the quality associated with educated applicants will be confirmed and solidified.[53]

The next section tackles the question of whether it makes sense to view voluntary VAT registration by small supplier entrepreneurs through the lens of Spence's signaling model.

Part IV: Applying the signaling model to voluntary registration by small suppliers

A. Background requirement: is there asymmetric information?

The private information held by job applicants about their productivities that Spence modeled in the context of hiring has been analogized to countless other markets, including commercial markets. George Akerlof explored this setting using the example, among others, of low-quality used car "lemons" (1970).[54] In a commercial market that contains high-quality products as well as lemons, an entrepreneur who has private information about the high quality of her product will face a problem that is similar to that of the high-quality job applicant.[55] Potential customers, because they remain

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[50] Id. at 358 and 368 (acknowledging that "there may be other returns to education. It may be a consumption good or serve as a signal of things other than work potential (status for example). These returns should be added to the offered wage schedule;" however, education is in the base model is "strictly unproductive").

[51] Id. at 362.

[52] Id. at 358 ("[f]or if this condition fails to hold, given the offered wage schedule, everyone will invest in the signal in exactly the same way, so that they cannot be distinguished on the basis of the signal").

[53] Id. at 362-4 (emphasizing, however, that there can be an infinite number of equilibriums and that not all "equilibria are…equivalent from the point of view of welfare. Increases in the level of y* [education] hurt Group II [high-productivity] while, at the same time, members of Group I [low-productivity] are unaffected. Group I is worse off than it was with no signaling at all. For if no signaling takes place, each person is paid his unconditional expected marginal product).

[54] See George Akerlof, The Market for 'Lemons:' Quality Uncertainty and the Market Mechanism," 84:3 Quarterly Journal of Economics 488, 493 (1970) (illustrating the problem of adverse selection in commercial markets).

[55] The entrepreneur seeks to form various relationships with counterparties to grow her business, not just with buyers. Other counterparties might include suppliers of inputs, employees, creditors, or equity

uninformed about the product's high quality, will be willing to pay a price corresponding only to the average quality (i.e., the midpoint between the prices for high- and low-quality products).[56] The entrepreneur, who under competitive market assumptions cannot survive unless she recoups her costs of producing a high-quality product, will be unable to accept this average price. As a result, she will be driven out of the market in a fashion similar to that of the high-quality job applicant in Spence's model.[57] This is very sad because the gains from trade that would have made both the entrepreneur and her customers better off are forfeited—solely due to the information structure of the market![58]

It is reasonable to believe that small suppliers, like sellers of used cars, are likely to participate in markets characterized by non-trivial amounts of asymmetric information. First, as compared to larger and more established businesses, providing credible information about quality to buyers may be more difficult. For instance, small suppliers are unlikely to have invested (yet) in other costly signals of quality through advertising and brand-promotion. So even if complete information exists for some sellers in a market, it may remain incomplete with respect to the new or the small.[59] Second, small suppliers are unlikely to have a broad base of customers who are willing to vouch for the business through referrals or customer reviews. In such a context, the "lemons" problem is not farfetched, and small suppliers may be more likely to be on the lookout for viable signals—verifiable ways to communicate their high quality—that can help them overcome the problem of information asymmetry and help them make inroads into the market.

Taking as a given the presence of asymmetric information for small suppliers and their customers, the balance of this Part assesses whether the two central requirements of the signaling model, as discussed in Part III.B, are satisfied.

B. Requirement 1: is voluntary registration costly?

Signaling must be costly, and can be thought of as investing in an asset that yields value in the form of providing credible information to one's counterparties. In the context of registering for and complying with a fairly complicated tax, what sort of evidence is there on costs?

1. *VAT compliance is costly, especially for small businesses*

The costs to a business of VAT registration may include a one-time initial ("fixed") cost of registering and putting in place systems to charge VAT. Being registered for VAT also entails annual ("periodic") costs

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investors. Here, for simplicity, I will focus on the entrepreneur's problem of matching with customers willing to pay a competitive price for her product.

[56] In a simple scenario, this might be the midpoint between a high- and low-quality price.

[57] See Akerlof, supra note 54, at 489 ("good cars may not be traded at all").

[58] Id. at 490 (emphasizing that in the more realistic scenario with a continuous distribution of quality-types, "even worse pathologies can exist;" showing formally that the market collapses entirely as "it is quite possible to have the bad driving out the not-so-bad driving out the medium driving out the not-so-good driving out the good in such a sequence of events that no market exists at all").

[59] Id. at 499-500 (discussing the "brand-name good" as an example of an institution that "counteracts the effects of quality uncertainty").

of charging customers, keeping track of input credits, calculating net tax owing, and filing VAT returns.[60] These costs are incurred each accounting period. Here, to streamline the analysis, I assume that the fixed cost of actually registering and implementing start-up systems is small compared to the annual variable cost of VAT compliance for a given small supplier.[61] Therefore, when referring to the costs of voluntarily joining the VAT system, "registration cost" refers to a small supplier's periodic costs of complying with VAT.

There is a large body of empirical research on VAT compliance costs.[62] As Kathryn James puts it, "simplicity is not…[the] VAT's greatest virtue."[63] Numerous studies establish not only that VAT compliance costs generally are significant but also that they are disproportionately large for smaller businesses. A recent review of this empirical literature concluded that, across jurisdictions, the costs involved in complying with a VAT are highly regressive with respect to a business's size.[64] Sharon Smulders and Chris Evans state in a recent article that "[VAT compliance] costs are…high and significant, as well as severely regressive — even more so than for other business taxes."[65] They explain that, for large and small businesses alike, "[i]t is not just the frequency of reporting and payment that contributes to VAT compliance costs. The length of a VAT return and the amount of information requested by a revenue authority in respect of VAT can also have a significant impact on the compliance costs of taxpayers."[66] In general, the registration costs associated with VAT registration are substantial.[67]

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[60] See Cedric Sandford, Minimising the Compliance Costs of a GST, 14 Austl. Tax F. 125, 128 (1997).

[61] The signaling account does not rely on this assumption; in fact, relaxing it gives rise to another way in which the one-time fixed cost itself voluntary registration can work as a signal much like a one-time investment in education. I do not pursue this argument, however, because I am not aware of empirical support for the proposition that initial start-up compliance costs are large in magnitude relative to the ongoing variable costs of VAT compliance. One exception to this may arise in the context of a newly-adopted VAT, where businesses must navigate systems that are new to the entire taxpaying population. In such cases, proposals to provide subsidies to registering businesses have gained traction (including in Canada). When Canada adopted the GST in 1991, one of its transition measures was a sliding-scale payment to small businesses to "offset the costs involved in the introduction of GST." See Prafula Fernandez and Lynne Oats, "GST and The Small Business, Curtin Business School Working Paper Series 98.01 (April 1998), at 25. Payment was provided upon registration, and enterprises with no more than $600,000 in sales received a cash payment of $300, while enterprises with sales from $600,000 to $2 million received a cash payment of the lesser of 0.5 percent of their sales and $1,000. Id. In addition, to complement this subsidy, during 1991 and 1992, a special provision allowed full expensing for income tax purposes of the capital cost of electronic point-of-sale and related inventory equipment. See L. Dana, A Goods and Services Tax (GST) and the Small Business Sector: Some Canadian Reflections, 52:4 Australian J of Public Admin 457, 461 (1993).

[62] See Chris Evans, Taxation compliance and administrative costs: an overview, in Michael Lang, C. Obermair, J. Schuch, C. Staringer and P. Weninger, Luca Barbone, eds., Tax compliance costs for companies in an enlarged European Community (2008), at 458.

[63] See James, supra note 18, at 31 (citations omitted).

[64] See Barbone et al., supra note 34, at 15.

[65] See also Smulders and Evans, supra note 19, at 283-4.

[66] Id. at 288.

[67] Id. at 288 and 307 (elaborating that "[i]t is not just the frequency of reporting and payment that contributes to VAT compliance costs. The length of a VAT return and the amount of information requested by a revenue authority in respect of VAT can also have a significant impact on the compliance costs of taxpayers"); Bird and Gendron, supra note 31, at 120; Barbone et al., supra note 34, at 1-5, 15; Evans, supra

However true it may be that VAT registration is costly, this general costliness is not, on its own, sufficient to meet the "costliness" requirement of the signaling account. Studies showing that, on a relative basis, registration costs for smaller businesses exceed those of larger businesses are also not specific enough to be helpful. The signaling account requires attention to the costs of being part of the VAT system under very particular circumstances: the decision to voluntarily register as executed by a small supplier that otherwise would be exempt from VAT by virtue of a statutory registration threshold.

Such "particular circumstances" will vary, of course, from one jurisdiction to another depending on the level of the applicable registration threshold and the specific rules surrounding it. Under these varying circumstances, viewing VAT compliance costs in isolation can be misleading. To address the relevant issue of the costliness of *voluntary* registration, which is by definition only available to exempt small suppliers as defined under a particular statute, the next sub-part resolves the suspense surrounding the final piece of the VAT mechanics discussion in Part II: why would a small supplier register voluntarily?

2.   *However, for some voluntary registrants, formality chain effects offer benefits*

Phrasing the above query in reverse, are there net *benefits* available to small suppliers that voluntarily register? If the action that is an alleged signal provides a benefit to the alleged signaler rather than imposing a cost on her, it is not a signal in the informational sense. Eric Posner, who uses the signaling model to explain a range of social norms that are relevant to law (including social norms surrounding tax compliance), states:

> Signals are costly actions that are recognized as such by those who observe them, and they have the function of disclosing information about the person who sends the signal. An action is not a signal if the actor intrinsically enjoys the action (like eating ice cream) or obtains some benefit from it (like selling goods) independent of the information benefit.[68]

This is a caution well-heeded in the present context. The "formality chain effect" model explains why a small supplier may opt into the VAT. It identifies circumstances under which voluntary registration is likely to be economically beneficial, net of registration costs, to the small supplier.[69] This is not

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note 62, at 458.

[68] See Eric Posner, Law and Social Norms: The Case of Tax Compliance, 86 Virginia Law Review 1781, 1787 (2000).

[69] See Aureo de Paula and Jose A. Scheinkman, Value-Added Taxes, Chain Effects, and Informality, 2 Amer. Econ. J: Macroeconomics 195-221 (Oct. 2010), at 196 (measuring and referring to the formalization achieved through voluntary registration as a "chain effect;" testing the theory with data from Brazil and finding that "various measures of formality of suppliers and purchasers (and its enforcement) are correlated with the formality of a firm"); Liu and Lockwood, supra note 29, at 3 (showing that "voluntary registration by a firm is more likely when either (i) the cost of inputs relative to sales is high, or (ii) when the proportion of B2C sales by the firm is low. The intuition for (ii) is simply that if most customers are VAT-registered, the burden of an increase in VAT can easily be passed on in the form of a higher price because the customer itself can claim back the increase. The intuition for (i) is that when input costs are important, registration allows the

good news for the signaling model.

The formality chain effect model posits that voluntary registration may confer benefits on a small supplier through two distinct but related channels, each of which relies on input crediting.[70] The first, the "customer channel," occurs when a small supplier sells her output to a formal, VAT-registered customer. It relies on the proposition that such a customer will be, at worst, indifferent to paying VAT on the sale price of the product purchased from a voluntarily registered small supplier. This is because the registered customer can simply claim its input VAT as a credit against its own output VAT liability. Moreover, VAT-registered customers may have an affirmative preference for trading with suppliers that are VAT-registered, due to the non-tax positive spillovers from formality. These may include receiving formal invoices that improve internal accounting and managerial performance or enforcing contracts at lower cost on the basis of such documentation.[71]

The second channel is the "input channel." The focus of the input channel is on the small supplier's ability to claim input credits for *itself* rather than any interactions with customers. The crux of the channel is that input credits in most developed-country VATs are fully refundable to registered businesses.[72] Thus, where a small supplier spends more on its purchases of inputs from VAT-registered suppliers than it collects in revenues from customers (generates a loss in this manner), registering voluntarily for VAT will put it in a net refund position. The small supplier in this situation will be able to claim a cash benefit from voluntarily registering.[73]

But even if the small supplier is *not* in a net refund position, voluntary registration can help a small supplier "unstick" the input VAT that would otherwise become embedded in its prices. This improves the small supplier's cost structure relative to its unregistered competitors. The input channel requires, of course, that the small supplier has paid VAT on some purchases of inputs (that is, sourced at least some of its inputs from VAT-registered business). With a broad-based VAT, however, this likely will be the case even for a service business where the dominant input is the entrepreneur's labor.[74]

Connecting this idea of "unsticking" tax paid on inputs back to the first channel for formality chain effects (the customer channel), a registered customer's awareness that the ability to voluntarily register on the part of its counterparty—the unregistered small supplier—can be used as a bargaining chip. Because voluntary registration can improve a small supplier's cost structure through the input channel, a registered customer (or prospective customer) of a small supplier may encourage the small supplier to voluntarily register. One might envision a statement by a registered customer to an unregistered small supplier along the lines of, "we prefer sourcing our inputs from VAT-registered

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firm to claim back a considerable amount of input VAT").

[70] See discussion using this terminology in Satterthwaite Electing, supra note 11, at 5-8.

[71] See Jeff Pope, Estimating and Alleviating the Goods and Services Tax Compliance Cost Burden on Small Businesses, 11 Revenue L. J. 1, 13 (2001).

[72] See Crawford et al., supra note 5, at 295-6.

[73] See Keen and Smith, supra note 27, at 863.

[74] Even a predominantly labor-based business typically needs some tools or overhead that may be non-self-supplied (e.g., externally sourced from a VAT-registered business).

firms because registering allows you to claim input credits, which reduces your costs. And we don't suffer whether you charge us VAT on your output; you would, of course, give us a proper invoice to allow us to claim a credit. So, please register so that we can share in some of those cost savings in the form of more competitive prices!"[75]

The above sketch of the formality chain effect model conveys that voluntary registration is most beneficial for a small supplier for which *both* the input and the customer channels are present. A recent study by Li Liu and Benjamin Lockwood tests the model's predictions using data from nearly the entire universe of UK firms that have revenues greater than or in the vicinity of the registration threshold (which happens to be high, at about $140,000). It finds robust empirical support for both the input and customer channels for formality.[76]

Where does this discussion leave us? The formality chain effect model reveals that, when an exempt small supplier sources its inputs from VAT-registered suppliers and sells its output to VAT-registered customers, economic *benefits* may be gained from registering voluntarily. Viewed in isolation, this fact presumptively disqualifies voluntary registration as a candidate for applying Spence's signaling model: the alleged signal is not costly.

3. *Net of formality chain effect benefits, which small suppliers will find voluntary VAT registration costly?*

However, neither the compliance cost discussion in section (1) nor the formality chain effect benefit discussion in section (2) can or should be viewed in isolation. The signaling model does not differentiate in regard to the *source* of an alleged signal's costs. It merely requires that, on a net basis, the signal imposes costs on the signaler. Also, take note that the formality chain effect model does not engage with the messy reality of compliance costs. Although it implies that the benefits of registering must exceed the costs of doing so in any case where formality chain effects are observed, it does not consider how such costs interact with the customer and input channels. I take up that issue here.

The following variables represent the key elements of each discussion. For a given small

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[75] In case it is helpful to explore whether this same dynamic could be driven by VAT-unregistered customers of small suppliers, such as individual customers at retail, the following few sentences does that. Conceivably, a retail customer would appreciate a similar opportunity to share in the input cost savings available to the small supplier upon voluntary registration. However, in this setting, the *absence* of the customer-channel (no credit can be used by the customer!) means that the input cost savings would need to offset, in some fashion, the burden of the VAT, the incidence of which will be split in some way between the small supplier and customer. The most obvious instance in which such cost savings could be expected to outstrip any price increase experienced by the customer from charging VAT is when the small supplier is in a net VAT-refund position, and registering allows her to claim the refund. However, being in this sort of a net loss position is unlikely to be sustainable in the long run for the small supplier, so it would be surprising to see a customer-channel formality chain effect that is driven by the preferences of unregistered customers.

[76] See Liu and Lockwood, supra note 29, at 21-26.

supplier in a given accounting period:

- C represents the registration cost (the small supplier's cost of complying with VAT);
- I_r represents the value of inputs purchased from VAT-registered suppliers;
- S_u represents the value of sales to VAT-unregistered customers;
- α can take values from 0 to 1 and represents the extent to which the supplier (rather than the final customer) bears the incidence of VAT; and
- t represents the rate of VAT that is applied by VAT-registered businesses to their customers at the point of sale.

Voluntary registration will be profitable if:

$$I_r\, t\ > \alpha S_u t + C \tag{1}$$

Expression (1) is most simply stated in words: to be profitable for the small supplier, the benefit of voluntary registration must be greater than its cost.[77] Specifically, if the value of a small supplier's input VAT (i.e., VAT paid on purchases from VAT-registered suppliers that would be refunded in the event of voluntary registration) is greater than the sum of (a) the small supplier's output VAT charged to customers who cannot use credits (i.e., individual customers at retail or unregistered small suppliers) and (b) the compliance costs associated with being registered, then the small supplier will have an economic incentive to register voluntarily.

The $\alpha S_u t$ term on the right side of the inequality requires a bit of explanation. By including on the "cost" side a scaled amount of output VAT charged to unregistered (think retail) customers, I assume that the economic incidence of the VAT may diverge to a lesser or greater extent from its legal incidence (which, as a consumption tax, is on the final consumer/retail customer). Where α is closer to 1, the more economic incidence diverges from legal incidence. Higher α implies that more of the (economic) burden of the VAT will be borne by the small supplier rather than the unregistered customer.

The reason for including the α parameter is because economic incidence is determined by many factors. One is the degree to which the market for the small supplier's output is competitive. If the market for the small supplier's output was perfectly competitive (an unrealistic and perhaps formally impossible assumption, but illustrative nonetheless), a voluntarily-registered small supplier would not

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[77] Note that neither a variable representing the value of inputs purchased from VAT-unregistered suppliers (I_u) nor a variable representing sales to VAT-registered customers (S_r) appears in expression (1). With respect to I_u, informal inputs will not yield input tax credits even if the small supplier registers, so they are immaterial to the voluntary registration decision. With respect to S_r, sales by a small supplier to registered customers—even if the small supplier registers and they are taxed—will be accompanied by a tax invoice that shifts the burden of the VAT downstream to the final consumer. This makes them similarly immaterial to the small supplier's voluntary registration decision.

expect its unregistered customers to be indifferent to an increase in its tax-inclusive output price as a result of its choice to voluntarily register. To the extent that unregistered customers are able to purchase an output available at a lower price from unregistered small suppliers in the market, one can expect these arbitrage opportunities to be exploited. To avoid this, small suppliers that voluntarily register may need to bear the full incidence of the VAT.

Table 1 summarizes the four "boundary cases" that represent the possible all-or-nothing combinations of the input channel and the customer channel. The inequalities in each of the quadrants describe the circumstances under which voluntary registration will provide a net benefit for a firm with the given input and customer channel combination. They are the result of simply substituting, rearranging, and, where they are not relevant, letting terms drop from expression (1).

Specifically, the "yes" ("no") labels for the input channel refer to situations in which all of the small supplier's inputs are purchased from VAT-registered (VAT-unregistered) suppliers. Similarly, the "yes" ("no") labels for the customer channel refer to situations in which all of the small supplier's sales are made to VAT-registered (VAT-unregistered) suppliers. The intuition of the inequality in each quadrant is discussed further below.

Table 1: Circumstances under which a small supplier with given input/customer channel characteristics will benefit from voluntary registration

		Input channel?	
		Yes	**No**
Customer channel?	**Yes**	$C < I_r\,t$ (i)	$C < 0$ (ii)
	No	$C < I_r\,t - \alpha S_u\,t$ (iii)	$C < -\alpha S_u\,t$ (iv)

Quadrant (i) represents the prototypical setting contemplated by the formality chain effect model. Both the input and customer channels are listed as "yes" because the small supplier sits in the middle of a formal supply chain. The inequality, stated in words, implies that such a small supplier will decide to register voluntarily if its compliance costs of registering are less than value of its refundable input VAT. VAT charged on output in this situation does not enter into the calculus; the small supplier's registered customers can simply credit this amount against their own VAT owing. How likely is it that quadrant (i)'s inequality will be satisfied such that the small supplier will benefit from registering voluntarily? This is, of course, an empirical question that depends on the values of the variables. But it is not inconceivable. All it requires is that the small supplier has purchased a sufficiently large quantity of inputs from VAT-registered suppliers, and its compliance costs are sufficiently small. Another way of thinking about this is that, unless the small supplier's inputs are nearly exclusively non-taxable, such as labor, and thus would not generate input credits (e.g., $I_r\,t$ would be very small), the decision *not* to register under these conditions would be surprising. Small suppliers described by this quadrant that decline to register voluntarily might even prompt *negative* inferences about their quality—perhaps they are not registered because they have high compliance costs for a reason that reflects on their reputation. Regardless, it seems reasonable

to expect that, all else equal, small suppliers described by quadrant (i) will register voluntarily, just as the formality chain effect model suggests.

Quadrant (ii) describes a situation in which no inputs are purchased from VAT-registered suppliers, but all sales are made to VAT-registered customers. Small suppliers in this quadrant have no input channel effects. This implies that, although the small supplier bears no liability for output VAT (its registered customers can use input credits to pass the burden of the VAT downstream) there are no benefits of registering voluntarily that can offset its compliance cost. Imagine, for instance, a freelance consultant who provides advice to VAT-registered firms as a sideline to her main work, using no taxable inputs. The inequality that appears in quadrant (ii) can be satisfied only if compliance costs are negative. This is impossible or at least extremely far-fetched: having a negative compliance cost would seem to imply that a positive consumption benefit was derived by the small supplier from VAT compliance.[78] Thus, to the extent that small suppliers have positive compliance costs, we would not expect to see voluntary registration even in the event that a customer of the small supplier demanded it. In response to such a demand, the small supplier would point out simply that voluntarily registering would cause it to face further costs, not savings, at least a part of which the registered customer would need to bear.

Quadrant (iii) describes a situation in which all inputs are purchased from VAT-registered suppliers but all sales are made to VAT-unregistered customers (individuals at retail or non-voluntarily registered small suppliers). For voluntary registration to be profitable under such circumstances, the benefit of claiming input credits net of the cost of output VAT must be greater than the compliance cost. This means that the small supplier must operate at such a significant loss that the cash received from the (net) VAT refund more than offsets its compliance costs. How plausible is it for a small supplier to be in this situation? While an initial period of losses may be expected as the business gets off the ground before significant revenues can be claimed, it is unlikely that small suppliers will be able to sustain themselves indefinitely in this quadrant (i.e., in a loss position for many periods). In equilibrium over time, such small suppliers will be expected to drop out as they fail. Moreover, there is some evidence in the context of Canada's very low registration threshold that loss firms described by quadrant (iii) may be unwilling to incur the registration and compliance costs that are a prerequisite for claiming an input tax refund.[79]

Finally, quadrant (iv) describes a situation in which voluntary registration is even more implausible than in quadrant (ii). The inequality will be satisfied only if the small supplier's compliance cost is less than an already-negative value. The inequality would be satisfied only if C was so large in the negative direction as to be less than the negative of the VAT collected on sales to

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[78] Having a negative value for C would imply that the small supplier would be willing to pay to enjoy the experience of complying. This might be the case for a small supplier who also happened to be a tax professor studying VATs.

[79] See Satterthwaite, supra note 11, at 5-6 and 15-17 (finding evidence consistent with customer channel chain effects but no evidence consistent with input channel chain effects among Ontario small suppliers in sample; contrasting with Liu and Lockwood's evidence of both channels; hypothesizing that the absence of input channel chain effects might be specific to Ontario's very low threshold, pursuant to which voluntary registrants are, by definition, microentrepreneurs).

unregistered customers. This strains credulity even for a small supplier with very high levels of enthusiasm for tax compliance activities.

4. *Illustration: costs of voluntary registration for a hypothetical small supplier*

The four quadrants in Table 1, as noted above, demarcate the range of possibilities by identifying the all-or-nothing boundary cases of the customer and input channels in the presence of compliance costs. To illustrate its implications and show how the costliness of voluntary registration plays out in a more mainstream case (where both input and customer channels are present for a small supplier), suppose a hypothetical small business located in a VAT jurisdiction with a registration threshold of $30,000 has the following characteristics. Assuming an accounting period of one year, let:

- C = cost of complying with VAT = $500
- I_r = value of inputs purchased from VAT-registered suppliers = $5,000
- I_u = value of inputs purchased from VAT-unregistered suppliers = $1,000
- S_r = value of sales to VAT-registered customers = $10,000
- S_u = value of sales to VAT-unregistered customers = $15,000
- α = 0.5 (for simplicity)
- t = rate of VAT that is applied by registered businesses to their customers at the point of sale = 0.20

These characteristics describe a profitable small business: it expends $6,000 on inputs from both registered and unregistered suppliers, and generates $25,000 in total sales, qualifying it as a small supplier and making VAT registration voluntary rather than mandatory. Plugging these values into expression (1) above, voluntarily registering will benefit the business only if the following inequality holds:

$$I_r\, t > \alpha S_u\, t + C \quad \rightarrow \quad \$5,000 * 0.2 > 0.5 * \$15,000 * 0.2 + \$500$$
$$?$$

For this hypothetical small supplier, voluntary registration will not be economically beneficial. $1,000 is *not* greater than $2,000. On the basis of the customer and input channels and the compliance costs that are reflected in the variables, one would not expect that this business would voluntarily register: doing so is costly, to the tune of $1,000 (which may not seem large in absolute terms, but for this business, amounts to 4 percent of its gross receipts). For this hypothetical small supplier, the costliness requirement of Spence's model would be met with regard to its choice to voluntarily register.

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Even accounting for the potential benefits of voluntary registration, a subset of small suppliers (quadrants (ii) and (iv)) is likely to find voluntary registration to be costly: those without

significant input credits that can be claimed upon voluntary registration. The next section engages with the question of what might motivate this subset to voluntarily incur this cost.

C. Requirement 2: do voluntary registration costs vary inversely with small supplier quality?

The second requirement of the signaling model is that the cost of sending the signal to the signaler must be *inversely related* to its quality. As noted above, "quality" in this context refers to characteristics that increase signal recipients' willingness to transact with the signaler. I briefly sketch here two ways in which this inverse relationship between cost of voluntary registration and small supplier quality might arise.

1. Compliance ability as proxy for quality

The first relates directly to the inequalities above—voluntary registration will, by definition, be more affordable for small suppliers with relatively low costs of VAT compliance. Notwithstanding studies finding that average VAT compliance costs are significant and especially so for small businesses when measured as a percentage of turnover, there is, due to many different factors including opportunity cost of time and psychic costs of tax-related tasks, significant variation in the actual compliance costs experienced by different small supplier entrepreneurs.[80] Higher or lower costs might stem from a variety of factors: a small supplier entrepreneur may have prior experience with tax compliance generally in the context of business, or with the VAT in particular. Or, they may be especially sophisticated about, comfortable with, or personally committed to performing compliance-related tasks.

Higher-sophistication or higher-experience entrepreneurs may be likely to find the specific task of voluntary VAT registration and compliance less intimidating than lower-sophistication or lower-experience entrepreneurs for a number of reasons. They may be more sophisticated about navigating problems generally, more intellectually able, or simply better-resourced with respect to networks of people to whom they can turn for help. Such problem-solving capacity, intellect, or network resources may also be correlated with higher levels of business success, and therefore may function as a proxy for quality.

2. High commitment to compliance as a proxy for quality

This proxy applies Posner's analysis of tax compliance and social norms to the VAT voluntary registration context.[81] Suppose that taxpayers vary in their tastes for/commitments to

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[80] See Nahida Faridy et al., Complexity, Compliance Costs and Non-Compliance with VAT by Small and Medium Enterprises in Bangladesh: Is There a Relationship?, 29 Austl. Tax F. 281, 292-309 (2014) (finding evidence from a mixed-methods survey that compliance costs are regressive with respect to firm size; also documenting substantial variation in compliance costs across individual small business respondents).

[81] To the extent that the entrepreneur values registration as insurance, it may signal the entrepreneur's taste for tax compliance (e.g., her aversion towards tax non-compliance). Such a taste See Posner, supra note 65, at 1787-89 (2000) (explaining the repeat prisoner's dilemma game in the context of time preferences:

legal and tax compliance (for simplicity, suppose there are high types and a low types). To the extent that taste for compliance is (1) positively related to firm quality and (2) negatively related to a small supplier entrepreneur's cost of registering voluntarily (her internal sense of her compliance cost, C) there may be scope for signaling. I examine the case for each of these propositions in reverse order.

With respect to (2), high commitment to compliance implies high aversion to the risk of being non-compliant. In the context of voluntary registration, such risk aversion may increase the small supplier entrepreneur's propensity to voluntarily register, particularly where she faces some probability of unwittingly exceeding the registration threshold through an unexpected or lumpy sale that could push her turnover over the threshold without her knowledge, thereby causing her to break the law. Voluntary registration thus could provide "insurance" against the risk of non-compliance. This is especially true when the statute has detailed (and often complex) rules for assessing whether turnover has exceeded the registration threshold is complicated and imposes fines for late registration.[82] Under such circumstances, the high commitment to compliance implies high willingness to purchase "insurance" in the form of voluntary registration, which in turn translates into a low subjective cost of registering voluntarily. Remaining unregistered is particularly costly for these types.

Proposition (1) is less straightforward. It seems plausible that, in the context of firms rather than individuals, that counterparties would want to match their own commitment-type with that of their trading partners rather than exhibiting a blanket preference for their own type. For instance, a low-commitment buyer might view a high-commitment seller's costly investments in compliance as wasteful, and would be unwilling to bear the cost of such investments.

However, legal developments relating to VAT enforcement within supply chains complicates this story. In a line of recent cases, the CJEU (Court of Justice of the European Union) has assessed the extent to which Member States can adopt provisions in their national VAT statutes that require taxpayers to scrutinize the legitimacy of their suppliers' VAT invoices.[83] In her assessment of a recent case (*SC Paper Consult*) addressing this issue, Dr. Caroline Heber argues that CJEU jurisprudence has validated the ability of Member States to impose significant (although not unlimited) monitoring duties on taxpayers.[84] She also suggests that Member States will respond by increasing their reliance on such provisions: "this case highlights what will become more critical in the future: The profound knowledge of the taxable person about the tax compliance of his suppliers

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"'[b]ad types' have high discount rates, meaning that they value future payoffs relatively little compared to current payoffs. 'Good types' have low discount rates. The standard result in the repeated model is that a necessary condition for cooperation is that both players have a sufficiently low discount rate").

[82] For example, in Canada, the registration threshold is defined by taxable supplies on a rolling four-quarter basis, in which turnover must be calculated monthly [add cite]. It is easy to see how a busy small business entrepreneur might not have the resources for this level of monitoring.

[83] See Caroline Heber, Input Tax Deduction, in Michael Lang (ed.), CJEU - Recent Developments in Value Added Tax (Vienna, Linde Verlag, 2017), at 345-7.

[84] Id.

and customers. Thus, taxable persons will need to invest more resources and power to monitor their supply chain for the right to deduct input VAT." [85]

This suggests that, in VAT jurisdictions that adopt such "monitoring"-type provisions, the positive spillovers to uninformed counterparties of contracting with high-commitment suppliers (whether small or otherwise) may be magnified, because they increase the benefits from avoiding low-compliance types. In such a setting, voluntary registration may work as a signal in its absence: a failure to register may be viewed as a red flag.

3. *Growth expectations as proxy for quality*

The second way in which an inverse relationship between a small supplier's cost of voluntary registration and its quality might arise relates to the small supplier's private information about its expectations for growth.

The more rapid the growth of a given small supplier, the shorter the time until the revenue level demarcated by the registration threshold is crossed, "bigness" is achieved, and VAT registration becomes mandatory. For a quickly-growing business, accelerating this moment by registering voluntarily is less costly—from an opportunity cost perspective—than for a slowly-growing business. In addition, accelerating voluntary registration earlier in time may offer the small supplier the benefit of insuring against accidental VAT noncompliance. This could occur if revenues grew past the threshold but the entrepreneur failed to notice, or noticed but, unintentionally, failed to register within the required timeframe.

Expectations regarding growth are a natural proxy for quality. Absent anti-competitive practices or fraud, growth can be seen as a validation by the market of the value offered by the business. A small supplier's low expected value of the opportunity cost of voluntarily registering for VAT can be a result of robust expectations for growth, and thereby can function as a signal of quality.

4. *Threats to signaling*

The idea that voluntary registration will allow firms to sort themselves observably by quality may have more coherence than initially expected. But there is a nagging question: what about small suppliers operating at a loss, those described in quadrant (iii)? While this cohort no doubt will contain some early-stage growth firms that may go on to experience very high returns later in time (and thus also may be amenable to the "growth expectations" analysis immediately above), it also seems likely to encompass a set of low-quality firms that will (but have not yet) failed. If many low-quality small

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[85] Id., at 347 (describing the SC Paper Consult case as referring to "its settled case law," and quoting the opinion as stating "…'it is not contrary to EU law to require a trader to take every step which could reasonably be required of hi to satisfy himself that the transaction which he is carrying out does not result in his participation in tax evasion'"). Note that the CJEU in this case found that the provisions of the Romanian VAT statute "went beyond what was necessary to achieve the objective [of ensuring the proper collection of VAT and the prevention of VAT evasion]…and thus the national provisions at issue were not in line with the EU VAT Directive." Id. at 346.

suppliers register voluntarily and "pool" with quadrant (ii) and (iv) firms, signaling will fail because it will not have sufficiently reliable informational content.

The response to this objection appeals to the dynamics of signaling over time. Loss firms, unless they are able to move into a profitable position within a reasonable amount of time, will be unable to sustain themselves. They may register in response to the cash incentive of an input tax refund, but on a net basis, this will only improve their economic position if it is greater than their cost of registering. Where this is the case, their business model is unlikely to be sustainable. Unless they move into profitability, they can be expected to drop out of the population of observable firms. In equilibrium, especially in higher-threshold jurisdictions, the empirical significance of these loss firms may be sufficiently small as to preserve the value of the signal. Even in low-threshold jurisdictions, there is some evidence that loss firms are reluctant to register voluntarily and may leave significant cash input tax credits on the table. Depending on the empirical significance of these small loss firms and how quickly they fail relative to the overall population of small suppliers, signaling can be preserved if those that voluntarily register are high-quality firms that are only temporarily described by quadrant (iii) and possess the private information to know that they will soon be better described by quadrant (i). For those that are destined for failure (which, I will assume, is the paradigmatic example of low quality), signaling requires that few take the leap of registering.

D. Summary of the model's applicability

This Part has argued that, under certain circumstances, voluntary VAT registration is likely to meet the requirements of Spence's costly signaling model. Further, the dominant model of voluntary registration—formality chain effects—and the signaling account may peacefully coexist. And, because it is unlikely that counterparties are always, or even most of the time, aware of the "small supplier" status of a given seller, voluntary registration offers a small supplier the possibility of "looking big" and therefore avoiding the stigma of smallness. This gives the signaling story intuitive appeal.

But the core insight of Spence's signaling model is that small suppliers are unlikely to avoid this stigma at any cost, and thus the circumstances under which they take on the cost of avoiding the stigma may communicate valuable information, across two differentiated groups of small suppliers. First, for the subset of small suppliers for which the formality chain effect is *not* present (quadrants (ii) and (iv)), registration is absolutely costly. Second, for the small suppliers with potential benefits from formality chain effects, such benefits will materialize only to the extent that they are larger than the compliance costs of registering. Put differently, the existence of formality chain effect net benefits implies some upper bound on a given small supplier's costs of voluntarily registering. Thus, taking the perspective of a VAT-registered supplier or customers of a small supplier, one begins to see how any reluctance on the part of the small supplier to voluntarily register might be construed as a sign of low quality. In this way, the value of sending the signal for the subset of small suppliers *without* formality chain effects may be bolstered.

[Add point about sectors where smallness and quality are mutually exclusive.]

Part V: Conclusion

The signaling account developed in this paper implies that offering small suppliers the ability to opt in to the VAT through voluntary registration can help resolve information asymmetries that may be particularly likely to affect small and micro-businesses, and complements rather than conflicts with the formality chain effects model. But why might a signaling channel for voluntary matter for VAT policymakers?

With asymmetric information, small businesses and their counterparties that have access to voluntary registration as a signal may be better off than they would be otherwise. This is because signaling may assist in avoiding a "lemons" problem in which counterparties cannot differentiate high-quality small suppliers from low-quality small suppliers. In particular, it could prevent a scenario in which high-quality small suppliers exit, leaving only low-quality small suppliers. Even under less dramatic circumstances where full-scale market unraveling does not occur (or is unlikely), the presence of a signaling channel for voluntary registration implies a more efficient matching of small suppliers with counterparties. In either of these scenarios, the existence of signaling improves resource allocation and allows gains from trade to be realized at lower cost.

On the other hand, it is difficult to rule out the conclusion that signaling in this context may be welfare-reducing. This could occur if there are less-costly non-VAT-related signaling mechanisms that small suppliers and their counterparties might gravitate towards in the absence of voluntary registration. Candidates include product marketing, packaging, location, and other costly actions that might work as signals.

This conclusion explores two tentative implications of signaling for the key VAT policy parameter for small suppliers: the level of the registration threshold. [86] First, if signaling is viewed in isolation (that is, other factors that influence the setting of a VAT registration threshold are ignored) and the phenomenon of signaling is found to be on-balance welfare-increasing, its presence counsels against having no registration threshold at all. This is because there can be no signaling if all businesses are required to register from the first dollar (except perhaps through outright evasion, which is always an available alternative, albeit a socially undesirable one). While zero-dollar thresholds are atypical, the typical approach for setting a registration threshold optimally emphasizes two potentially efficiency-maximizing equilibria: a very high threshold or a very low one.[87] Therefore, the signaling account may offer—at least until technological developments reduce VAT compliance and administration costs for small firms to near-zero levels—a new reason that policymakers might prefer the very high-threshold equilibrium to the very-low one.

The second conclusion engages more granularly with the question of how signaling might affect a policymaker's analysis of the optimal registration threshold. This is because signaling relies

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[86] The consensus model for setting an optimal registration threshold does not incorporate voluntary registration. See Keen and Mintz, supra note 32, at 574 (third caveat in conclusion). Liu and Lockwood also do not model how formality chain effects through the "traditional" channels—input and customer—may impact the analysis of a threshold. See Liu and Lockwood, supra note 29 at 1-5.

[87] See Keen and Mintz, supra note 32, at 569.

on the level of the registration threshold being set more or less "correctly." What does this mean? In the signaling context, "correctly" means that the threshold is set such that it induces separation between high-quality small suppliers (as they voluntarily register) and low-quality small suppliers (as they remain exempt). If the threshold is set too low, too few firms will have access to the signal, because they will be required to register. If the threshold is set too high, many firms will have access to the signal, but it may be so high as to be "out of reach" even for some high-quality firms. Such firms may take a wait-and-see approach (particularly with regard to their expectations for growth) rather than investing in voluntary registration, thereby compromising the informational benefits of and resource allocation gains from signaling.[88]

But it is not at all clear how a threshold that is "correct" in the context of the signaling account matches up with or diverges from a threshold that is "correct" in that it maximizes production efficiency, minimizes compliance and administration/enforcement costs, and while also minimizing revenue leakage according to the optimal threshold model.[89] The reason for this is simple: to remain tractable, the optimal threshold model doesn't directly analyze voluntary registration.

Nonetheless, to the extent that a given VAT jurisdiction's registration threshold has been set as optimally as possible on the basis of factors other than signaling, emerging evidence of signaling may indicate that the threshold should be set slightly *higher* than it would be otherwise. All else equal, the signaling channel will *increase* the ranks of the population of voluntarily registered small suppliers, which may impose public costs that are not privately internalized absent government intervention. In particular, such costs are generated by the marginal voluntary registrant that demands public administration and enforcement resources from the public taxing agency. Calibrating upward the threshold is the most obvious route by which the public costs of signaling could be internalized into the private "price" of registration faced by small suppliers.

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[88] Id. at 568-72 (showing an outsized role for firm-size distortions at the notch; "as the threshold is increased, those constraining their sales to keep just below the threshold find it desirable to expand output").

[89] Id. The basic intuition behind Keen and Mintz's high-threshold recommendation is that a high threshold minimizes efficiency losses from firm-size distortions by ensuring that only the largest firms are in the vicinity of the threshold. Put differently, the output-distorting notch represented by the registration threshold is simply out of reach for the majority of firms. This results in greater competitive fairness (horizontal equity) across firms of similar sizes while (i) saving substantial government administration and enforcement costs and (ii) compromising little VAT revenue net of such costs.