Income Shifting and Tax Evasion: Evidence from an Uruguayan Tax Reform

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Abstract

This paper provides novel empirical evidence on intertemporal income shifting as a consequence of a large tax reform in Uruguay. We exploit VAT and income tax returns at the individual level. We observe this information for the universe of individuals that declare activity as liberal professionals (e.g. lawyers, public notaries, architects and accountants) during the years around the reform. Using a difference-in-difference approach, we document large shifting responses of personal business income in the period before the reform was implemented. After controlling for fixed effects, we find that on average an amount of 35 thousand Uruguayan pesos (1450 US$) or approximately 13% of income is shifted in order to receive a beneficial fiscal treatment. This amount increases up to 23% for the top of the income distribution. Furthermore, we show that lawyers and notaries respond much stronger and drive indeed most of the result. This confirms that income shifting, as a means of tax evasion, depends on the information taxpayers have about the functioning of the tax system.

JEL Classifications: H26; H24: H20
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1 Introduction

This paper provides novel empirical evidence on intertemporal income shifting as a means of tax evasion. We analyze a large tax reform implemented in Uruguay in 2007 to study this phenomena. Intertemporal income shifting, in general, refers to the case when taxable income is shifted between fiscal years in order to reduce the total tax burden. For example, individuals face incentives to delay (advance) declaration of income generated in one year if tax rates are expected to decrease (increase) in the future. Given the complexity of most tax reforms, the salience effects regarding shifting incentives are another important issue to analyze. Goolsbee (2000) and Kreiner, Leth-Petersen, and Skov (2016) show that, even in relative terms, the rich tend to exploit this possibility to reduce the tax burden more than the poor. Therefore, studying income shifting is not only important in order to understand the revenue implications, but also to evaluate the possible unintended distributional effects of tax reforms. Our study contributes to this debate.

The Uruguayan context offers an interesting case to study income shifting. A center-left coalition took power in Uruguay for the first time in 2005. During the electoral campaign, the president elected, Tabaré Vázquez, promised a fiscal reform towards a more equitable tax system. During 2006, the proposal was discussed in the parliament, and the final law was passed just before the end of the year on December 28^{th}. The reform became affective soon after on the 1^{st} of July of 2007. The most salient characteristic of the reform was the introduction of a dual income tax (*Impuesto a las Rentas de las Personas Físicas*, IRPF) with a flat tax for capital income and a non-linear tax schedule for labor income. Previously, a wage and pensions tax[1] was levied according to only three tax rates of 1%, 2% and 6%. Under the new income tax, labor income is taxed with a progressive tax schedule, consisting of six rates ranging from 0 to 25%.[2]

We exploit a unique data-set to investigate income shifting. Our administrative data contains VAT and income tax returns at the individual level. We observe this information for the universe of individuals who declared activity as liberal professionals (e.g. lawyers, public notaries, architects and accountants, etc.) for each bimester between 2007 and 2010 before and after the reform. This provides six annual data-points and allows to analyze income shifting towards May/June of 2007, just before the reform became effective.

The change in labor taxation was particularly relevant for liberal professionals. Before the reform, the income generated by these liberal professions was not subject to the pre-existing wage tax to the same extent as for the rest of wage earners. Professionals only paid the wage tax based on a fix presumptive income, generally, much lower than actual income.[3] Under the new tax system, the income generated by these professionals was considered as labor income and, therefore, started to be taxed according to the new progressive scheme. Therefore, the intro-

[1] *Impuesto a las retribuciones personales* (IRP)
[2] See Section 2 for further details.
[3] See Llambi, Laens, and Perera (2016) and World-Bank (2008) for a discussion of this.

duction of the dual income tax generates a large increase in the tax burden for this collective. In 2008 the average tax rate, on average, was 7.2%, varying from 0 to 24.8%. We exploit this variation in our empirical analysis, because individuals with a higher post-reform average tax rate have stronger incentives to advance income to the pre-reform period.

To identify the intertemporal shifting behavior, we split the universe of individuals among those who were severely affected by the reform and those who were not. The split is based on their average tax rate in 2008 and 2009, which is not affected by income shifting anymore as shifting can only happen across month within the year 2007. Our data allows us to show that, apart from the time around the reform, these two groups were following parallel trends. We use this setting to present graphical evidence showing that income shifting was present around the introduction of the income tax. Specifically, we observe a clear spike in the VAT reported by medium-high and high income individuals just the bi-month before the reform came in force (May-June of 2007). In real terms, the average VAT reported by the individuals in this bi-month was 76% higher than in the same bi-month of other years. This difference increase until 116% and 136% when we consider those individuals with strong incentives to shift income (90^{th} and 95^{th} percentiles respectively). Second, we apply a generalized difference-in-differences approach to get a causal estimate of the magnitude of the effect. We confirm this large shifting responses of business income in the period before the reform was implemented (in the middle of 2007) among those taxpayers with strong incentives to advance income. Furthermore, we also observe heterogeneous behavior among professions, standing out the amounts of income shifted by lawyers and public notaries.

Our study contributes to the knowledge of behavioral responses to tax reforms and, in particular, to the growing but still scarce literature on intertemporal income shifting and tax evasion behavior in emerging economies. Starting with Slemrod (1995), only a few paper have studied this issue. The most related studies to our paper are Goolsbee (2000), le Maire and Schjerning (2013) and Kreiner, Leth-Petersen, and Skov (2016). Apart from being the first focusing on an emerging economy, we improve to the previous literature of intertemporal income shifting in several aspects. First, our data allows us to implement a standard differences-in-differences approach and to prove the identifying assumptions of this method. Second, analyzing heterogeneous effects is important as it sheds light on the salience of this particular mechanism of tax evasion and potential distributional consequences.

This paper is organized as follows. Section 2 describes the main features of the tax reform. The data and some stylized facts are presented in Section 3. In the same section, we explain how we exploit the specific features of this reform for identification. Section 4 presents the main results before we conclude in Section 5.

2 The 2007 Tax Reform in Uruguay

Previous to the 2007 Tax Reform, the Uruguayan tax system was very complex, composed by a large number of inefficient taxes. The tax system consisted in more than 30 taxes, however, most of public revenues were concentrated in very few of them. Value added tax, an excise tax on specific products[4] and a corporate tax on benefits[5] collected more than 83% of total tax revenues in 2006 (excluding payroll and local taxes).

The new government launched the Tax Reform with three main objectives. First, to generate a more equitable tax system, relating the tax burden to the taxpayer's capacity. Second, to eliminate inefficiencies of the tax system by abolishing 14 taxes, and finally, to stimulate productive investment and employment. The reform included changes in direct, indirect and payroll taxation and also introduced some technological innovations.[6]

The important change for our study is the introduction of a personal income tax (IRPF) on all domestic sources of income. This tax replaced a pre-exsting wage tax and had a progressive tax schedule with six income tax brackets and rates ranging from 0 to 25% (See Table 1). Deductions were allowed for social security contributions, fixed health allowances for pensioners and fixed deductions for children. Capital income is taxed at a flat rate of 12%.[7]

This change in income (labor) taxation was particularly relevant for liberal professionals. Before the reform, the income generated by these liberal professions was not subject to the IRP as the rest of wage earners. They only paid the tax (IRP) based on a fix presumptive income, generally, much lower than actual income.[8] Under the new tax system, the income generated by these professionals were considered as labor income and, therefore, started to be taxed according to the new progressive scheme with a deduction of 30%. According to World-Bank (2008) more than 60% of the professionals paid more in income tax after than before the reform. This created a huge variation in average tax rates in 2008 (after the reform) over total labor income:

[4] *Impuesto específico interno*, IMESI in Spanish, was a tax on several goods as tobacco, electricity, gasoline, vehicles, drinks, sugar and cosmetics

[5] *Impuesto a la renta de industria y comercio*, IRIC in Spanish

[6] The main elements can be summarized as follows: a) the introduction a personal income tax (IRPF) that substitute several taxes (specific to certain types of income); b) the unification of corporate income taxes on agriculture and other economic activities (*Impuesto a las Rentas Agropecuarias* - IRA and *Impuesto a las Rentas de Industria y Comercio* - IRIC in Sapnish) into a single tax. The new tax (IRAE), with a flat rate of 25%, reduced in 5 p.p. respect to the previous corporate tax rates and coincide with the top marginal rate in the IRPF; c) a reduction VAT rates, both basic and minimum VAT rates were reduced by 1 and 4 p.p. respectively (from 23% to 22% and from 14% to 10%); d) several goods and services, previously exempted, were included in the new tax base (e.g. financial services and tobacco products at basic rate and, health services, public transportation, and the first sale of real estate properties at minimum rate); e) the consolidation of the employer's social security contribution into a single 7.5% general rate and the elimination of several sectoral exemptions; f) the simplification of the tax system eliminating several taxes, including taxes on corporate income (IRA) and wages (IRP), the tax used to finance social security (*Impuesto de Contribucidn al Financiamiento de la Seguridad Social*, COFIS in Spanish) and the tax on health services (*Impuesto Específico a los Servicios de Salud* , IMESSA in Spanish). For more details on the reform see Llambi, Laens, and Perera (2016) and World-Bank (2008).

[7] The nonresidents' income, generated in Uruguay, is taxed also at a flat rate of 12%.

[8] See Llambi, Laens, and Perera (2016).

Table 1: *Tax Brackets and Rates (2007)*

tax brackets	tax rate (%)
0 to 60 BPC	0
60 to 120 BPC	10
120 to 180 BPC	15
180 to 600 BPC	20
600 to 1200 BPC	22
above 1200 BPC	25

Notes: The value of Base de Prestaciones Contributivas (BPC) in the second semester of 2007 was $U 1,636 (aprox. USD 72). Source: *Dirección General Impositiva* (DGI) .

The average ATR was 7.2%, varying from 0 to 24.8%. We exploit this variation in our difference-in-difference setting, as individuals ending up in higher brackets after the reform had larger incentives to advance their income from personal businesses. An individual with income from professional activities at the lower bound of the 90-percentile faces an average tax rate of approximately 17% under the new system. If he would have shifted that income to the pre-period, his average tax rate would have been only 6%, implying a 2.8 times lower tax burden. An individual at the median of the distribution faces only an average tax rate of 8.3% after the reform and the same average tax rate as the rich individual before. Therefore, his tax burden increases only by a factor of 1.4. This illustrates the variation of the after-reform tax burden which we exploit for identification.

3 Data and Identification

3.1 Data

We have access to a high quality administrative data-set from the Uruguayan Tax administration (*Dirección General Impositiva*). Our empirical analysis is based on VAT and income tax returns for the universe of contributors for the most relevant liberal professions in Uruguay in the period 2007-2010. The data-set contains bi-month VAT payments at the individual level, desegregated at 5 digits of the International Standard Industrial Classification of All Economic Activities (ISIC), for the universe of the individuals who declared professional liberal activities.[9] Concretely, we have information for IT-professionals, lawyers, public notaries, medical

[9]With the tax reform the tax authority also implemented several IT innovations that improved, among others, the data collection process. Therefore, the most reliable data is from 2007 onwards.

doctors[10], architects, engineers, accountants, veterinaries, advertising and other minor professions.[11] We are able to match the VAT data (pre- and post-reform) with the annual income tax returns (post-reform) for all tax-payers.[12]

In order to avoid noise in our data, we exclude individuals who carry out activities as liberal professional very sporadically and focus on individuals which report business activity in every bimester throughout our period of study. This means individuals presenting VAT returns in all 30 bi-months of our period. We also exclude individuals who pay, by their own choice or by obligation of law, the corporate tax instead of personal income. Most of these individuals, start to pay this tax after the reform which implied a change in their taxation.[13] In total, our sample consists of 12,299 taxpayers. This accounts for almost 50 % of the individuals affiliated to their respective professional associations in 2007.[14] Among the main professions are lawyers and public notaries (5,563), architects and engineers (2,609) and accountants (2,184).

For our sample, the average annual labor income reported in 2008 was 639,395 Uruguayan pesos $U (approx. 26,000 USD), corresponding the 39% to income from the liberal activity of the profession. In the same year, the annual average wage in the country was 140,700 $U (approx. 6,716 US$). Therefore, our sample, on average, covers taxpayers in the upper part of the income distribution. In our empirical analysis is based on the amount of declared VAT by the individuals in our sample. The median VAT declared in 2008 is approximately 29,500 $U. The top-10 percentile of our professionals declared more than 130,000 $U and the top-5 percentile includes professional income above 192,000 $U. Note that the VAT declared is just a percentage of the income which is subject to the personal income tax. All these amounts correspond to 22% (VAT rate in 2008) of the gross income that should be included in the income tax base. Taking into account the new tax schedule (see Table 1) and the maximum tax rate before the reform (6%) highlight the strong incentives for income shifting.

3.2 Identification

We start our analysis with a simple graphical exercise to provide evidence for shifting behavior, before we turn to a difference-in-differences approach to get a causal estimate of the magnitude of the shifting effect. Treatment in our setting is based on being in a certain percentile of the

[10] We have to exclude medical doctors from our analysis. Health services, previous the reform, were exempted in the VAT and also were subject to another specific tax (IMESSA).

[11] Our data-set contains information for the following codes of the five digits classification of productive activities (ISIC): 62010, 62020, 62090, 63110, 63120, 69101, 69109, 69201, 69209, 70201, 70202, 70209, 71101, 71102, 71103, 71109, 71200, 72100, 72200, 73100, 73200, 74101, 74109, 74901, 74902, 74903, 74909, 75000, 86100, 86201, 86202, 86203, 86209, 86902, 86909, 87200, 87300, 88100, 94120 and 95110.

[12] Income tax returns are available for the second semester of 2007 and onwards at yearly frequency.

[13] These individuals represent around 5% of the universe of individuals of our data-set. Including these taxpayers into our sample has only marginal effects on the results.

[14] Not all the professionals in their respective associations carry out a liberal activity. Many of the professionals are associated for other purposes, for instance, for paying for a special retirement plan.

income distribution after the reform. As explained before, the new tax system is progressive such that only individuals which assumed to end up in high tax brackets faced incentives to shift income to the period before the reform became effective. We start by splitting treatment and control at the median of the average income tax rate in 2008 and 2009. We use this period as income in the reform period itself would be affected by the shifting effect itself. Later, we change the definition of treatment to the 75th, 90th, and 95th percentile.

In particular, we estimate a generalized difference-in-difference model

$$vat_{i,t} = \beta \cdot treat_i \cdot t_t + \alpha_i + \varepsilon \tag{1}$$

where $treat$ is our treatment indicator. For $t = 3$, $\beta_{t=3}$ measures the effect of income shifting just before the reform. The estimated coefficients for the other years allow us to analyze pre- and post-trends over time. All models include a full set of individual (tax payer) and time fixed effects. The outcome variable is VAT declared. Dividing β by the statutory VAT rate indicates the amount of income shifted.

4 Results

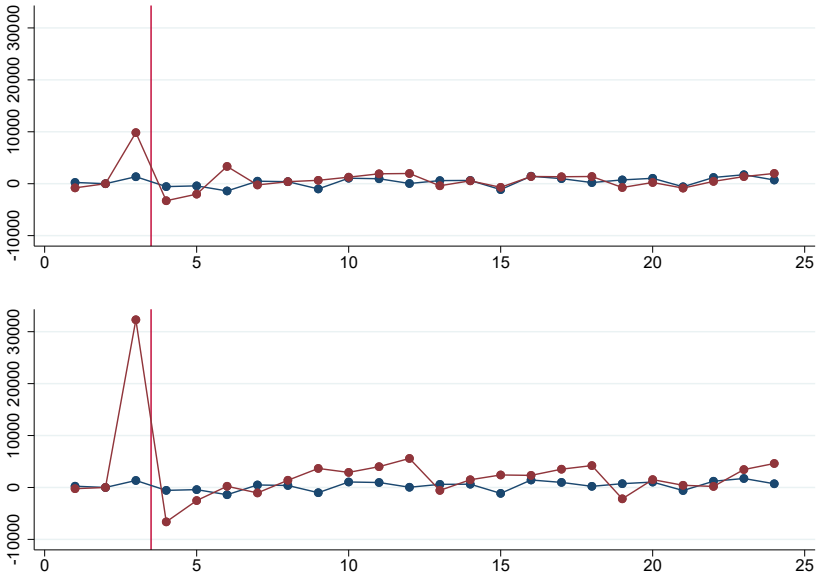
4.1 Graphical evidence

We start by providing graphical evidence for shifting behavior. We show binned data for each bimester between January 2007 and December 2010. The reform was implemented between the third and fourth bimester in 2007 as indicated by the vertical line. We normalize the data to March-April of 2007, the month before we expect income shifting to occur. The red line represents the treated individuals and the blue line the control group. We define treatment as being subject to a higher average tax rate under the new regime and compare them to those whose average tax burden is approximately the same before and after the reform.

The top panel of figure 2 compares individuals with an average tax rate (in both years 2008 and 2009) above and below the 50-percentile. The bottom panel changes the treatment definition to the top 10 of the distribution.

The figure shows a clear and strongly pronounced effect of income shifting in favor of the third bimester in 2007. As expected, this effect is much stronger for those individuals which expected to face a higher average tax rate after the reform. In other words, we find that the most affected individuals are indeed the most responsive ones. The graph also shows that the treatment group was very similar to the control group before the reform (the first dot in the graph). This is also true after the reform, as we observe similar post-trends. This reassures the assumptions needed for identification.

Figure 1: *Income shifting: 50 (top) and 90 (bottom) percentile.*



Notes: Data binned at the bimester level. VAT declared must be divided by 0.22 to obtain income. The top panel compares individuals with above- and below-median ATRs in 2008 and 2009. The bottom panel compares individuals in the top 10 of the ATR distribution to those below the median.

4.2 Difference-in-differences

We implement a simple difference-in-difference specification to get an estimate of the magnitude of the effect.

Table 2: *Dif-in-dif results*

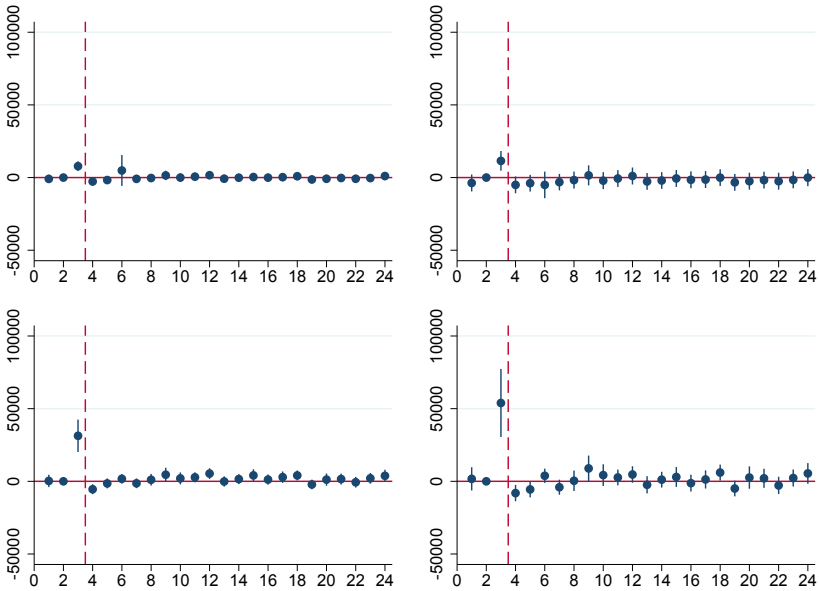
	(1) median	(2) 75pc	(3) 90pc	(4) 95pc
$\beta_{t=3}$	7,815***	11,483***	31,330***	53,895***
	(1,696)	(3,467)	(5,676)	(11,952)
# taxpayers	12,299	10,285	8,346	7,652

Notes: Each coefficient is the dif-in-dif result from equation 1 for the bimester before the reform. The dependent variable is VAT declared by a liberal professional. Treated are individuals with an ATR after the reform above the 50-percentile and control below. Models (2) treats individuals above the 75th percentile, (3) above the 90th and (4) above the 95th percentile. Robust standard errors, clustered at the tax payer level, in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

The estimates in table 2 confirms our graphical results. After controlling for fixed effects, we find that an amount of 7,815 $U is shifted by individuals with above-median average tax rates. Given that the sum of declared VAT in 2008 in all bimesters was approximately 56,000 $U, we find that 13.5% of income where shifted (or 8.6 % as a share of declared VAT by above-median tax payers). Dividing this amount by the statutory VAT rate of 22% shows that the total income

shifted amounts to 35,523 $U (approx. 1450 USD) Interestingly, our estimations show that this effect is increasing by the level of treatment. In model (2), we treat the 75th percentile and find that the effect increases to 11,483 $U of declared VAT. Turning to the top 10 of the distribution, the baseline effect more than quadruples and for the top 5 we find an effect as big as 53,895 $U which represents 92% of the average declared VAT (in 2008) or 23% as a share of VAT declared in the top 5 category (approx. 225,156 $U).

Figure 2: *Dif-in-dif results*



Notes: Dif-in-dif estimates from equation 1. The dependent variable is VAT declared by a liberal professional. Top left: 50/50 sample; top right: 50/75; bottom left: 50/90 and bottom right 50/95.

Figure 2 shows the estimated coefficients for all periods and all four specifications. Important for our identification ios that we do not observe pre-trends before $t = 3$ in the first period. Unfortunately, we cannot observe longer trends as reliable data before 2007 is not available (or only for a sub-sample of observations). However, we also observe that trends after the reform revert and we do not find any differences across the two groups in any subsequent period across our four specifications. For $t = 4$ and $t = 5$ we find negative but small effects, which reflect the fact that part of this income has been shifted to the prior period.

Our data allows us to estimate heterogeneous effects across different professions. Table 3 shows results for the sub-sample of IT-related professionals, lawyers, accountants, architects, veterinaries, and publicity. We restrict both,. treatment and control to the respective sub-sample of individuals. The top panel A shows the result for our 50/50 specification and shows huge heterogeneous effects across professions. Model (1) shows that IT-related professionals on average shift only half of the amount compared to the baseline. We obtain similar results for accountants and veterinaries. Architects shift an amount comparable to the baseline. Interestingly, the effect for lawyers doubles compared to the previous average estimate. On average

14,064 $U (i.e. 64 thousand $U of income) are shifted. This result indicates that professions which might have had more information about the reform and the particular legal background were more responsive than others. The salience of this tax reform to specific professions might drive the variation across professions. In panel B of the same table we repeat the exercise for the 50/75 sample. As expected, the differences across professions persists but the increase is also different. While for veterinaries and architects the coefficient remains the same, significant increases in the level can be detected for the lawyers in our sample.

Table 3: *Heterogeneous effects*

	(1) IT	(2) lawyer	(3) accountants	(4) architects	(5) vets	(6) publicity
	Panel A: *treatment: 50-percentile*					
$\beta_{t=3}$	4,574**	14,064***	3,610***	7,107***	3,906***	2,287
	(1,952)	(3,540)	(656.1)	(2,557)	(1,203)	(2,991)
# taxpayers	365	5,563	2,184	2,609	460	132
	Panel B: *treatment: 75-percentile*					
$\beta_{t=3}$	7,537*	20,614***	4,558***	7,045**	3,838**	5,813
	(3,964)	(7,454)	(1,046)	(3,413)	(1,900)	(5,838)
# taxpayers	299	4,696	1,827	2,188	386	114

Notes: Each coefficient is the dif-in-dif result from equation 1 for the bimester before the reform. The dependent variable is VAT declared by a liberal professional. In panel A (B) treated are individuals with an ATR after the reform above the 50-percentile (75-percentile) and control below the median. Professions as indicated in the table. Robust standard errors, clustered at the tax payer level, in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

5 Conclusion

Using a unique dataset of Uruguayan professionals, we document substantial shifting of personal business income as a means of tax evasion. This contributes to the scarce but growing literature on income shifting as tax avoidance or tax evasion. Our results show that between 13 and 23% of income were shifted. Furthermore, we show that lawyers and notaries respond much stronger and drive indeed most of the result. This confirms that income shifting, as a means of tax evasion, depends on the information taxpayers have about the functioning of the tax system. While our data allows to investigate many more dimensions, these preliminary results show that the evasion effect here might be regressive as professions which have higher average incomes benefit the most from shifting behavior.

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