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2017

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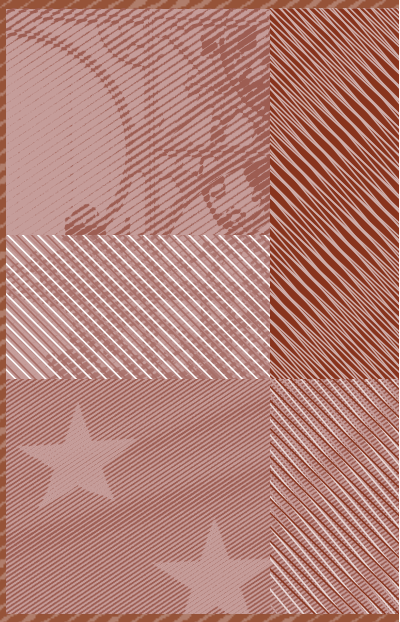

Documentos de Trabajo
N.º 1721

BANCO DE **ESPAÑA**
Eurosistema

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(*) We thank José María Labeaga, Enrique Moral-Benito, one anonymous referee, and seminar participants at Banco de España (27 May 2016) and SAEe Bilbao (15 December 2016), for comments and discussions. We are also very grateful to Valery A. Ramey and Sarah Zubairy for their help. The views expressed in this paper are those of the authors and do not necessarily coincide with the views of Banco de España or the Eurosystem.
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Documentos de Trabajo. N.º 1721

2017

ISSN: 1579-8666 (on line)

Abstract

This paper estimates the GDP impact of legislated tax changes in Spain using a newly constructed narrative record for the period 1986-2015. Our baseline estimates suggest that a 1% of GDP increase in exogenous taxes depresses output by around 1.3% after one year, this negative effect fading away at more distant horizons. We also find that the effect of changes in indirect taxes are larger and that, following a tax increase, investment reacts more than consumption. Overall, our set of estimates is consistent with negative output effects triggered by tax increases, yet the quantitative effects are subject to non-negligible uncertainty that is refected in wide confidence bands, in line with the extant literature for other countries.

Keywords: tax shocks, narrative record, fiscal policy, GDP growth.

JEL classification: E32, E62, H20.

Resumen

En este artículo estimamos el efecto sobre el PIB de los cambios impositivos a partir de una base datos narrativa que hemos construido para el periodo 1986-2015. La estimación base muestra que un aumento de los impuestos equivalente al 1 % del PIB reduce el producto un 1,3 % después de un año; tendiendo este efecto a desaparecer en horizontes más amplios. Los resultados también muestran que el efecto de la imposición indirecta es mayor y que, después de un aumento impositivo, la inversión reacciona más que el consumo. En su conjunto, nuestra estimaciones sugieren que los aumentos impositivos tienen consecuencias negativas sobre el PIB. No obstante, el grado de caída del producto está sujeto a incertidumbre, ya que las bandas de confianza son amplias. Este resultado está en línea con la literatura narrativa para otros países.

Palabras clave: cambios impositivos, base de datos narrativa, política fiscal, crecimiento del PIB.

Códigos JEL: E32, E62, H20.

1 Introduction

The macroeconomic effects of fiscal policy has long been a matter of great importance for researchers and policymakers, and the financial crisis in general and the public debt crisis in some euro area countries in particular have nothing but increased the interest in this topic. However, despite this growing interest, there is still no consensus about the economic consequences of fiscal actions. For example, in Alesina and Giavazzi (2013) the editors argue that "researchers are still deeply divided on some crucial issues such as the size (and sometimes also the sign) of fiscal multipliers."

Part of this discrepancy stems from the fact that measuring the impact of fiscal shocks is inherently difficult. Very often fiscal changes respond to or are correlated with macroeconomic conditions, hence causal effects are hard to establish. The recent literature has addressed this identification problem in mainly two ways. First, Blanchard and Perotti (2002) estimate a structural vector autoregression (SVAR) by modeling the relationship between the reduced-form residuals and the structural shocks using external information on the output elasticity of government purchases and of taxes, and by assuming that policymakers do not react contemporaneously to output shocks. Second, the narrative record identifies directly the fiscal policy shocks that are uncorrelated with macroeconomic conditions, by identifying the motivation behind each legislated tax change.[1]

In this paper we adopt the narrative approach to estimate the output effects of tax shocks in Spain. To this end, we have constructed a detailed record of all the relevant legislated tax changes implemented during the period 1986-2015. Therefore, this paper contributes to the literature pioneered by Romer and Romer (2010), who were the first to estimate the GDP effects of tax shocks using a narrative record, in their case for the US. Later on, this approach has been applied to the UK (Cloyne (2013)), Germany (Hayo and Uhl (2013) and Gechert et al. (2016)) and Portugal (Pereira and Wemans (2015)).[2]

Our work follows closely the methodology developed by this literature. First, we identify the tax measures that were more likely to be influenced by other macroeconomic shocks, in order to exclude them from the estimated impulse-response functions. To do so, we look at the motivation of each tax change, and categorize it as either "endogenous" (motivated by current or prospective macroeconomic conditions) or "exogenous" (whose motivation is not to offset macro developments), according to the eightfold classification proposed by Cloyne (2013). As some actions are difficult to categorize, for example those adopted during the recent period of financial turmoil, we discuss in detail the rationale behind our grouping.

[1] This approach has been used to estimate the impact of monetary policy (Romer and Romer (1989) and Romer and Romer (2004)), government spending (Ramey and Shapiro (1998) and Ramey (2011)) and fiscal consolidations (Guajardo et al. (2011)).

[2] The relative scarce number of countries subject to the narrative approach reflects the considerable effort required by the construction of a record of legislated tax changes.

We then aggregate the exogenous tax changes on a quarterly series. In order to assess the independence of this series from economic conditions, we check whether it can be predicted on the basis of past macroeconomic shocks. We show that we can reject predictability in most of the tests. However, the announcement of some measures during the financial crisis appear to be correlated with past macro developments. For this reason, the baseline estimates are based on a series that excludes those tax changes adopted in the period 2008-2013. We also show that the full set of exogenous taxes (including those implemented during the financial crisis) deliver similar impulse-response functions.

Next, we estimate the GDP effects of an exogenous tax change by constructing impulse-response functions derived from simple VARs. The benchmark specification is a three-variable VAR of per capita GDP, per capita government spending, and the short-term interest rate, with the tax series included as an exogenous regressor. We find that a 1% of GDP increase in taxes depresses output by around 1.3% after one year, this effect fading away at more distant horizons. We also find, as already mentioned, that including the measures adopted during the financial crisis does not significantly affect the estimates. Moreover, we show that this is also the case if we focus on tax changes aiming at increasing long-run growth or imposed by foreign institutions, which are less likely to respond to business cycle developments. Also, we find larger fiscal multipliers if we consider changes in indirect taxes and if we focus on the effect of tax shocks on investment, rather than on output or consumption. In all our results we show that the point estimates are subject to non-negligible uncertainty, as confidence bands are wide. Therefore, we raise a flag of caution in over interpreting some quantitative results.

All things considered, our set of estimates provides a coherent picture of negative short-term output effects triggered by tax increases (and vice versa). Overall, our results appear smaller when compared to previous findings of the narrative literature, and they contrast sharply with the results found for Spain thus far. In this regard, the related literature typically finds that the short-term GDP response to a net tax shock tends to be positive, a fact that is rationalized in those studies by highlighting that, following the revenue shock, a parallel increase of government expenditure takes place, pushing up GDP, see de Castro (2006), de Castro and Hernández de Cos (2008), and de Castro et al. (2014). In addition, this result probably reflects the difficulties of properly identifying a net tax shock within the SVAR approach and limited sample sizes, as reflected in a number of studies with European data, see European Commission (2012). This underlines the value of the narrative record, which is precisely aimed at determining which fiscal shocks are unrelated to macro conditions, and therefore it is able to provide an unbiased estimate of the output effects of tax changes, see the in-depth discussions of Romer and Romer (2010) and Cloyne (2013).

The rest of the paper is organized as follows. The next section describes our narrative record and discusses the endogenous/exogenous categorization of tax measures. Section 3 shows the main results regarding the GDP effects of tax shocks, and Section 4 presents further results. Section 5 concludes. Supplementary material can be found in the Appendix.

2 Narrative Record of Legislated Tax Changes in Spain (1986 - 2015)

This section describes the compilation of the legislated tax changes in Spain, the identification of the exogenous tax shocks, and the tests performed to assess their predictability given business cycle developments.

2.1 Construction of the Dataset

We compiled all the legislated tax measures adopted in Spain during the period 1986-2015. In doing so, we used multiple sources, covering a wide range of reports from different government agencies. We highlight three important ones. First, the Budget Law, which is typically approved in the last quarter of each year. This law is regarded as the most relevant bill passed by Parliament, and it usually contains the most significant fiscal actions to be implemented in the following year. Second, the annual and monthly bulletins of the Tax Agency, which contain a very detailed account of tax revenues. Moreover, they describe all the recently adopted tax changes, and provide an estimate of their quantitative impact, both on an annual basis and on a monthly basis in the last years of our sample. And third, own reports elaborated in real-time by Banco de España, containing both a description and a quantitative assessment of the revenue effects of tax measures. These latter reports are elaborated in the context of the fiscal surveillance framework of the Eurosystem.

In order to compute the revenue impact of each measure, as it is standard in this literature, we quantify the yearly change in revenues prompted by the tax change at the quarter it is implemented, normalized by GDP. Implementation corresponds to the first quarter in which the tax action triggers a change in tax liabilities/payments with respect to the previous year. For corporate income taxes we take into account the timing of tax payments as dictated by the extant legislation. In April a first payment must be done, of approximately 25% of tax liabilities (which are a function of the previous year's profits). A second installment is due in October (50%), and a third one in December (25%). Therefore, if a corporate tax action comes into effect in January, the yearly impact is assigned to the second quarter, as the first payment is done in April. If it comes into force after April, the yearly impact is assigned to the last quarter. For the personal income tax, as this is withheld at source, the yearly impact is assigned to the first quarter in which tax liabilities change. This is also the case of indirect taxes. Moreover, if the implementation of a tax measure lasts more than one year, we identify the set of revenue effects at each quarter it is implemented.

We also consider the temporary/permanent nature of each tax action: for measures announced to be temporary, we compute the revenue effect and compensate it with an effect of the opposite sign when the tax change is reversed. We also regard as tax shocks the failure to update excise (per unit) duties in a context of high inflation, which leads to a fall in revenue.[3] One advantage of our dataset is that we are able to use mainly estimated revenue changes, rather than revenue forecasts. These estimates are given by official sources, especially the Tax Agency, the Ministry of Finance and Banco de España.

We include in our dataset tax measures having a yearly revenue impact of more than 0.05% of GDP in absolute value in at least one quarter. Under this criterion, we record 75 legislated tax changes, of which 33 are permanent tax increases, 25 are permanent tax decreases, and 17 are temporary measures, see panel A of Table I. The cumulative yearly impact of the permanent tax increases is on average 0.22% of GDP, whereas that of permanent tax decreases is 0.25% of GDP. See Appendix BList of Legislated Tax Changesappendix.B for a list of all the measures recorded.

TABLE I
DESCRIPTIVE STATISTICS OF THE RECORDED TAX CHANGES

		Cumulative Yearly Impact			
	Number (1)	Mean (2)	Std. Dev. (3)	Min (4)	Max (5)
PANEL A: ALL TAX CHANGES					
All (Permanent + Temporary)	75	0.01	0.28	-0.79	0.94
Permanent Tax Increases	33	0.22	0.22	0.05	0.94
Permanent Tax Decreases	25	-0.25	0.22	-0.79	-0.01
PANEL B: EXOGENOUS TAX CHANGES (ALSO EXCL. THE FINANCIAL CRISIS)					
All (Permanent + Temporary)	45	-0.02	0.26	-0.79	0.75
Permanent Tax Increases	19	0.19	0.17	0.05	0.75
Permanent Tax Decreases	19	-0.24	0.21	-0.79	-0.05

Notes: This table shows descriptive statistics of all recorded tax changes (panel A) and the exogenous series excluding the financial crisis (panel B), which is used to compute the baseline impulse-response functions. The categorization of tax changes is explained in Sections 2.3 and 2.4. Columns (2) to (5) show statistics on the cumulative yearly impact of the tax measures. Note that, by definition, the cumulative yearly impact of temporary measures is zero, see Section 2.1.

2.2 Overview of Legislated Tax Changes in Spain

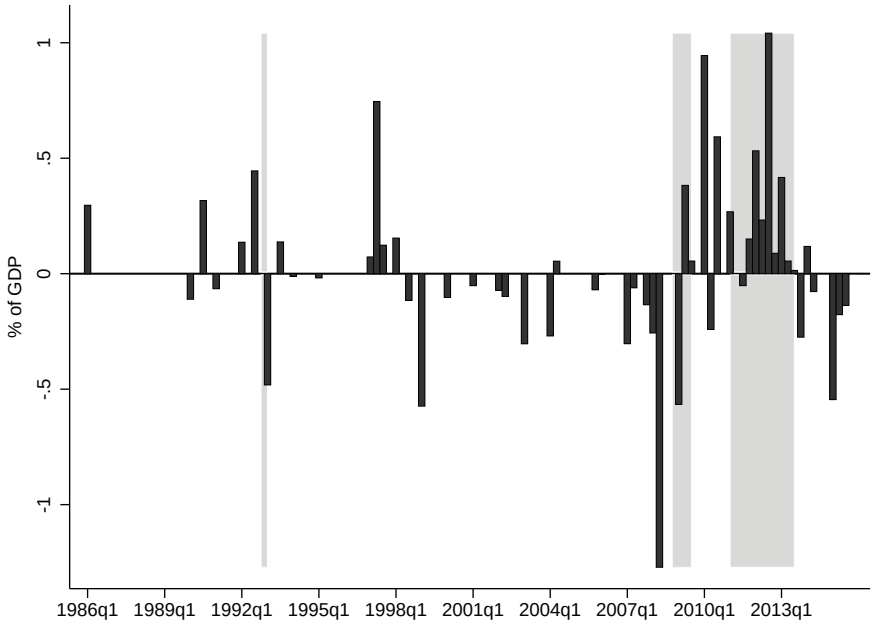
In this section, we provide a brief overview of the tax changes recorded in our narrative dataset for the period 1986-2015. Figure I plots the quarterly time series. A much more detailed account with emphasis on the motivation and the macroeconomic conditions surrounding the main tax changes can be found in Appendix AOverview of Legislated Tax Changes in Spainappendix.A.

The first ten years of our dataset (1986-1995) include mainly tax reforms aiming at adapting the Spanish tax code to the European regulations and complying with with European Treaties. The

[3]This means the inclusion of two shocks at the start of our sample.

Figure I

Legislated Tax Changes as Percentage of GDP



Notes: This figure shows the legislated tax changes in the period 1986q1-2015q4 as a percentage of GDP. Shaded areas correspond to two negative quarters of GDP growth.

government created the value added tax in 1986, fulfilling a requirement of the Spanish accession to the European Economic Community. Later on, it raised it twice (in 1992) in order to comply with the convergence criteria set in the Maastricht Treaty. A main reform of the personal income tax was approved in June 1991 and implemented in 1992-1993, motivated by a a sentence of the Constitutional Court deeming unconstitutional some articles of the original law of 1979 and 1985. This reform had a negative impact on revenue, due to the introduction of an exempt minimum income. Increases in indirect taxes (on fuel) had a significant impact on revenue in 1990 and 1991.

Following a reform of the corporate income tax in 1996, with a positive impact on revenue, the period 1997-2007 was characterized by tax decreases, stemming chiefly from revisions of the personal income tax (in 1999, 2003 and 2007), and the corporate income tax (in 2007), coupled with changes in social contributions and indirect taxes. Although small counter cyclical measures were adopted in 2002, in order to tackle a deceleration of activity, these reforms targeted long-run growth, competitiveness and compliance with European standards.

In 2008, after significant signs of a slowdown in activity, the government adopted a big stimulus package of around 1% of GDP. The tax decreases spanned 2008 and early 2009. After that, increasing concerns about the budget balance made the government change the policy stance. Tax increases were adopted in subsequent austerity packages, in December 2009, May 2010, August 2011, December 2011 and July 2012. They comprised significant increases in the personal income tax, the corporate income tax, the value added tax, as well as the suppression of a large number

of deductions. This contractionary fiscal policy ended by around 2013-2014, where some of the measures adopted previously still had an effect. Following a vigorous economic recovery and ahead of an electoral year, the government decreased direct taxes in 2015 by an amount close to 1% of GDP.

2.3 Construction of the Exogenous Tax Series

In order to estimate the impact of legislated tax changes on GDP, it is necessary to purge the tax series from tax changes that respond to current or prospective macroeconomic conditions. Failure to do so involves the risk of assigning to tax changes the effect of other shocks affecting output, therefore incurring in an omitted variable bias. The narrative literature distinguishes between "endogenous" and "exogenous" tax measures. This distinction, rather than strictly econometric, is one of terminology. The former correspond to tax measures enacted in order to offset other macroeconomic shocks likely to affect output in the near term. Therefore, they are invalid to estimate the impact of tax shocks on output. Examples of such measures are a tax decrease because policy makers forecast a recession, and a tax increase approved in order to finance a rise in spending. Tax measures deemed exogenous are those whose motivation is not to offset current macroeconomic developments. Examples of such measures include tax cuts implemented to increase potential output, and tax changes imposed by external bodies, such as the European institutions. These exogenous measures, to the extent that they are orthogonal to current or prospective macroeconomic conditions, are valid to estimate the effect of tax changes on GDP.

Cloyne (2013) provides a useful eightfold terminology on what can be considered endogenous and exogenous tax changes. We follow his guidance to construct the exogenous tax series of our narrative dataset. Our assessment of the the motivation of each tax measure is based on the examination of the introductory comments of each bill, press releases, media news and different reports.

Endogenous tax changes can be classified in four categories. First, a "demand management" change, that attempts to adjust aggregate demand to offset macroeconomic fluctuations. That is, tax measures pursuing a counter cyclical goal. We include in this category two measures adopted in 2002 to counteract a slowdown in activity, the stimulus package of April 2008 and one measure adopted in 2011 to improve the activity of the construction sector. We also include in this category a corporate income tax cut approved in late 2006 but with a large impact in the second quarter of 2008, when several stimulus actions were implemented.

Second, a "supply-side" reform, that attempts to offset a shock through the supply side of the economy. One example of this category is a reduction of social contributions in March 2009, aiming at fostering the labor market.

Third, a "deficit reduction" action, that is, a legislated tax change stemming from concerns over current movements in the deficit. This category is the most difficult to delimit. Romer and

Romer (2010) argue that tax measures responding to inherited budget deficits must be regarded as exogenous, as they are the consequence of past rather than current or future shocks. Cloyne (2013) distinguishes between "deficit reduction" measures, deemed endogenous, and "deficit consolidation" measures, deemed exogenous. As stated, the former includes measures triggered by concerns over current movements of the deficit or by a clear consequence of another shock. The latter includes measures adopted in order to deal with a budget deficit independently of the current macroeconomic conditions. Most of the measures taken by Spain in the period 2010-2012 clearly aimed at dealing with a growing budget deficit. Given the institutional setting of the Stability and Growth Pact, it can be argued that, at least partly, tax raises were imposed *exogenously* to the country, i.e. European policy makers paid less attention to GDP growth when suggesting the reforms, focusing instead on the evolution of the public deficit. On the other hand, some of the measures were taken under episodes of fiscal stress, which could have an independent effect on GDP growth. This reasoning suggests us to exclude from the exogenous tax series those measures adopted under periods of high financial turmoil, whereas reforms adopted to tackle the budget deficit under milder financial conditions and specially those with large implementation lags are in principle valid to be included in the exogenous tax series. As we note in the next section, however, we found that excluding all measures adopted during the financial crisis improves the unpredictability of the tax series, which advises us to shed all tax changes of the period 2008-2013, yet at the cost of losing the valuable information provided by the financial crisis. Given this trade-off, our empirical strategy is to estimate the baseline impulse-response functions with a tax series that excludes the endogenous measures *and* the (exogenous) tax changes adopted during the financial crisis, whereas we use the exogenous series with the tax changes adopted during the crisis in order to asses the sensitivity of the results (see Section 4.1).

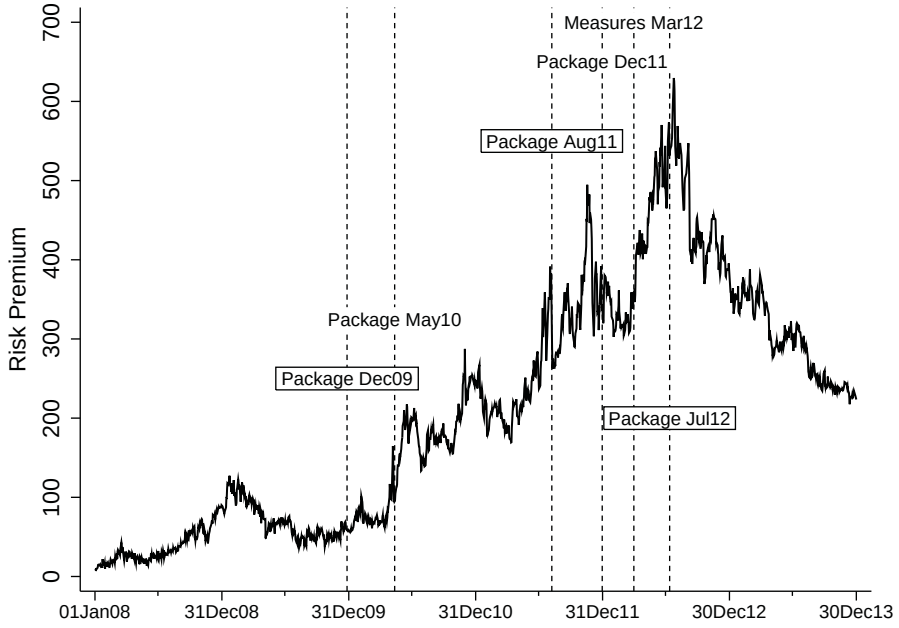
Regarding the categorization of the measures adopted during the crisis, we deemed as endogenous the austerity packages of August 2011 and July 2012. These were packages adopted with urgency under financial turmoil. Indeed, both of them were passed when the risk premium was at historical heights, see Figure II. We also deemed as endogenous the fiscal package of December 2009, because it consisted mainly on the removal of a stimulus measure adopted before. On the contrary, we classified as exogenous the austerity packages of May 2010, December 2011 and March 2012. The package of May 2010 was adopted under financial turmoil, but it consisted mainly on expenditure measures. The only relevant tax measure within that package was the suppression of a deduction on births and adoptions, which was announced in May but implemented in January the next year. Following the criterion of measuring impact at implementation rather than at announcement, we keep it in the exogenous series.[4] The packages of December 2011 and March 2012 fall in the category of tax changes stemming from inherited deficits. The former was adopted by a

[4]Under the same criterion, we classify as exogenous an increase in the value added tax passed in the package of December 2009 but implemented in July the following year.

new cabinet a few days after taking office, with the single goal of consolidating the public finances given an expected deviation of the budget from the target set by the European Union. The latter was approved a few weeks later when that deviation materialized. Moreover, both packages were implemented in relatively milder financial conditions: the risk premium was 150 basic points lower than the historical height reached in November 2011. Note that, as we stated before, the baseline estimates excludes all the measures adopted during the crisis, whereas the exogenous changes implemented during this period are used only in Section 4.1.

Figure II

Austerity Packages and the Risk Premium (2009-2012)



Notes: This figure shows the fiscal austerity packages approved in the period 2009-2012 and the daily Spanish risk premium, defined as the excess return of the Spanish 10-year bond with respect to its German counterpart. Fiscal packages framed by boxes are deemed as endogenous. The packages of August 2011 and July 2012 were taken under episodes of fiscal stress (risk premium at historical heights), and therefore their effects on GDP could be confounded by the effect of the concomitant financial turmoil. The package of December 2009 is also excluded because it consisted mainly on the removal of an endogenous measure. The packages of May 2010, December 2011 and March 2012 are deemed exogenous, and therefore included in the baseline regressions. Measures adopted in May 2010 consisted only on expenditure actions, the only tax action being implemented in January 2011. The packages of December 2011 and March 2012 fall in the category of tax changes stemming from inherited deficits. The former was adopted by a recently elected government with the aim of consolidating the public finances given an expected deviation of the budget from the target set by the EU. The latter was approved a few weeks later when that deviation materialized.

The fourth category of exogenous tax measures are "spending-driven" changes, aimed at financing an spending action. One prominent example of this is the introduction of a duty on fuels in 2002 in order to finance health expenditure.

Exogenous tax changes are likewise classified in four categories. First, "long-run" economic reforms, aiming at increasing long-run growth, rather than offsetting a shock. One example of this is the 2003 personal income tax reform, which was motivated on these grounds. Second, "ideological" changes, stemming from philosophical reasons, such as a preference for a lower fiscal pressure. Third, "external" changes, imposed by foreign bodies, such as the European Union. Many fiscal measures in our database correspond to this category. To name a few, the introduction of the value added tax in 1986, adopted as a requirement of the accession to the European Economic Community; two increases of this tax in 1992, passed in the context of the Maastricth Treaty; and the reform of direct taxation implemented in mid and late 1990s, in order to adapt the tax system to European standards and help the country adopt the euro. And fourth, "deficit consolidation" measures, adopted in order to anchor credibility, independently of the current macroeconomic conditions. As already discussed, we include in this category two fiscal packages adopted in late 2011 and early 2012, which main motivation was to comply with European rules. Other fiscal packages adopted in the period 2009-2012 were also to some extent *imposed* by the European institutions. However, they were taken under episodes of financial turmoil, which advices us to exclude them in the estimation of the effect of tax changes on GDP, as already discussed.

Overall, of the 75 measures adopted in the period 1986-2015, we classify 18 as endogenous. Furthermore, of the remaining exogenous changes, 12 were adopted during the financial crisis (2008-2013). This leaves us with 44 tax shocks, which comprise the narrative series that we use in the main simulations. In panel B of Table I we show descriptive statistics of this series and Figure III displays the timeline.[5]

2.4 Predictability of the Exogenous Tax Series

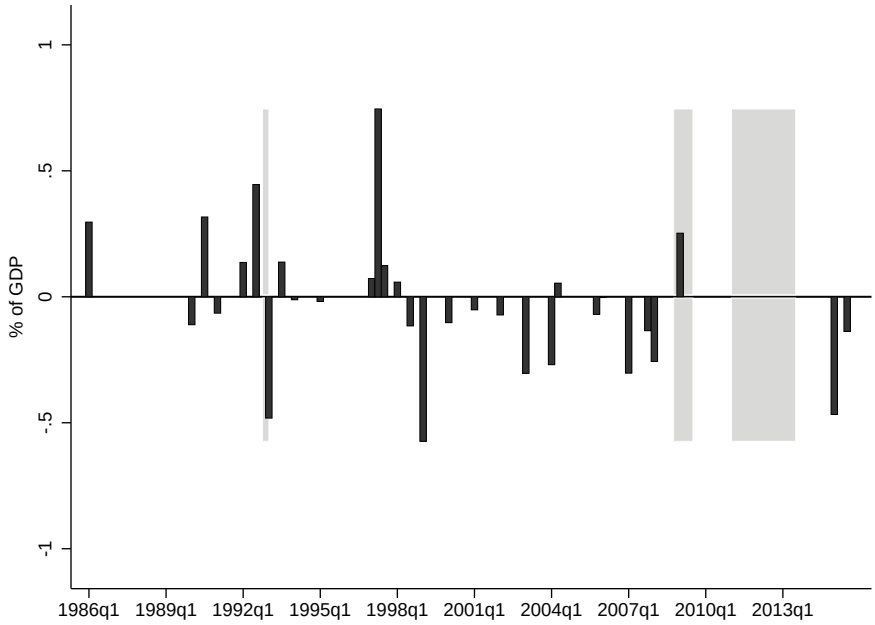
To assess how well our original narrative dataset has been purged from measures adopted with counter cyclical motivations, we analyze the predictability of our "exogenous" tax shocks following movements of output, government spending, inflation, and the short-term interest rate. These are standard tests proposed by the narrative literature, although it must be stressed that the contemporaneous independence of each tax change with respect to other aggregate fluctuations affecting GDP cannot be tested.

We perform four tests. First, a simple F-test of the joint significance of the macro covariates in a linear regression with our tax series as the dependent variable. Second, a VAR Granger causality test. Third, an ordered probit regression at the announcement date. This involves defining a dependent variable taking value -1 on the quarter a tax cut is announced, 0 if there are no tax announcements, and 1 if a tax increase is revealed, where the sign of the tax change is assessed according to its cumulative impact. Then, the predictability of tax announcements is assessed by means of a likelihood ratio test on models with and without the macro covariates. And fourth, we

[5]The distribution of the tax measures is the following. Long-run: 19; external: 9; and deficit consolidation: 17.

Figure III

Exogenous Legislated Tax Changes as Percentage of GDP



Notes: This figure shows the tax series used to estimate the baseline impulse-response functions. It corresponds to the exogenous (not triggered by current or prospective macroeconomic conditions) legislated tax changes excluding also those changes adopted during the financial crisis (2008-2013). Shaded areas correspond to two negative quarters of GDP growth.

perform a similar likelihood ratio test but defining the dependent variable at the implementation date, rather than at the announcement date. In all tests we use four lags of the macro covariates as well as of the dependent variable.

Table II shows the results. The exogenous tax series passes three of the four tests, see column (2). To be more more precise, we find no evidence of Granger-causality between the macro variables and the legislated tax changes. Moreover, in the simplest linear specification (F-test) we cannot reject the null hypothesis that the macro variables are jointly non-significant in their association with the tax shocks, see the first two rows. Our exogenous tax series though fails to pass the ordered probit test at announcement date, see the third row. That is, we find some evidence that macro developments help forecast decisions on tax changes, although not the magnitude. This casts doubts on the degree of independence of the narrative series from economic conditions, yet the small sample bias can also play a role. Importantly, however, we find that these macro conditions do not have predictive power when tax measures are evaluated at the implementation date, see the fourth row. This is somewhat reassuring, as the impact of tax shocks is computed when they enter into effect, rather than when they are announced. Moreover, it must be stressed that the announcement date reflects mostly the date when the tax bill becomes law, which can be a poor proxy of the timing when news about tax changes reach the economy. Yet, in order to

shed light on these results, we analyze whether the predictability is influenced by the tax changes adopted during the turbulent times associated to the financial crisis. We do so by excluding the tax changes adopted during the period 2008-2013 and we find that this series comfortably passes the four tests. As explained before, given these results and bearing in mind that the tax series enters as an exogenous variable in the VARs, we stick to the series without the financial crisis for estimating the baseline impulse-response functions and assess the sensitivity of the results to including those exogenous measures adopted in the period of high financial turmoil. As it turns out, both series deliver similar impulse-response functions.[6]

TABLE II
PREDICTABILITY TESTS OF LEGISLATED TAX MEASURES

	All Tax Measures (Endogenous & Exogenous)	Exogenous Series (1986-2015)	Exogenous Series (Excluding Financial Crisis)
	(1)	(2)	(3)
F-test	0.4513	0.5492	0.6313
Granger Causality	0.1990	0.8080	0.8570
Ordered Probit Announcement Date	0.0466	0.0131	0.1720
Ordered Probit Implementation Date	0.3254	0.7791	0.9010

Notes: This table shows the p-value of tests assessing how predictable are the magnitude and timing of the legislated tax measures. Column (1) includes all legislated tax measures (both endogenous and exogenous). The second column includes only the exogenous tax shocks for the period 1986-2015. The third column excludes all tax changes adopted during the financial crisis (2008-2013). The first row shows a linear F-test of the joint significance of the macro variables on their association with the legislated tax shocks. The second row performs a Granger-causality test. The third and fourth rows show likelihood ratio tests of the macro variables having no predictive power on the timing of legislated tax changes, at announcement and implementation dates, respectively. Macro variables include log change of GDP, government spending, inflation, and the short-term interest rate. All regressions include four lags of the macro variables as well as the tax series.

3 The Output Effects of Tax Changes in Spain

3.1 Baseline Specification

In this section we estimate the effect of a tax shock on GDP. We do so by estimating impulse-response functions derived from VAR models, see Favero and Giavazzi (2012).[7] Our baseline specification is a VAR of three endogenous variables: log real per capita GDP, log real per capita government spending and the short-term interest rate. Controlling for government spending and financial conditions is important as they can play a significant role. For example, interest rates experienced a large degree of volatility during the last years of our sample, affecting the dynamics of output. Regarding public expenditure, some important changes were adopted at the time of

[6]Hernández de Cos and Moral-Benito (2016) test the predictability of spending- and tax-based consolidations using the annual narrative dataset constructed by Devries et al. (2011). The sample covers 17 OECD countries during 1978-2007, including Spain. They find that spending-based consolidations can be predicted from past realizations of macro variables, whereas tax-based consolidations are unpredictable.

[7]This is also the framework of Mertens and Ravn (2012), Cloyne (2013) and Hayo and Uhl (2013), among others.

legislated tax changes and some other, possibly, as a substitute. Therefore, these factors are likely to affect the estimated impact of tax shocks on GDP. We add as exogenous variables the narrative tax shocks and a linear trend. In this and the subsequent VARs, we include 3 lags of the tax shock as well as of the endogenous variables, following an optimal lag length analysis.[8] Regarding the sources of the macro aggregate data, they are obtained from de Castro et al. (forthcoming).

The baseline VAR takes the following form:

$$Y_t = A_0 + A_1 t + A_2(L)Y_{t-1} + A_3(L)\tau_t + \epsilon_t \quad (1)$$

where Y includes real GDP, real government spending and the 3-month interest rate; t is a linear trend; τ_t is the narrative tax series; and $A_2(L)$ and $A_3(L)$ are lag polynomials of 3 lags. In our impulse-response functions we estimate the output effect up to 12 quarters of a 1% of GDP increase in tax liabilities. We compute 68 and 90% error bands by bootstrapping with 1,000 replications.

The panel A of Figure IV shows the baseline results. We find that after an increase in tax liabilities of 1% of GDP, per capita output falls by 1.3% after one year, from that moment on starting to improve until reaching an almost zero effect at the end of the projection horizon. The impulse-response function is estimated with a fairly high degree of imprecision, as can be noted from the wide confidence bands, which nevertheless suggest a significant decrease of GDP, at least in the short term. In order to compare these results with the literature, we estimate our baseline VAR for the US and the UK with the narrative series constructed by Romer and Romer (2010) and Cloyne (2013), respectively.[9] Panel B of Figure IV shows that the initial fall following a tax increase is very similar to the one in the US and the UK. Nevertheless, the overall multiplier is lower, as GDP in these two countries reaches the bottom at lower levels: -2.1% after 7 quarters in the US and -2.6% after 10 quarters in the UK. Moreover, the UK estimates seem to fall outside the 90% confidence bands estimated from Spain. Regarding other countries, Hayo and Uhl (2013) report a GDP fall of 2.4% in Germany after around 8 quarters. Their specification encompasses a five-variable VAR of output, tax revenues, government expenditures, the short-term interest rate and the inflation rate. The estimates of Pereira and Wemans (2015) for Portugal render a drop of 2.3% after 3 years when controlling for output and government spending dynamics. Therefore, the effect of taxes in Spain appears somewhat smaller than is generally found in the narrative literature. This result is suggestive, although it must be taken with caution, given that these impulse-response

[8] The final prediction error, Akaike's information criterion, and Hannan and Quinn information criterion suggest a lag order of 3, whereas the Schwarz's Bayesian information criterion a lag order of 2.

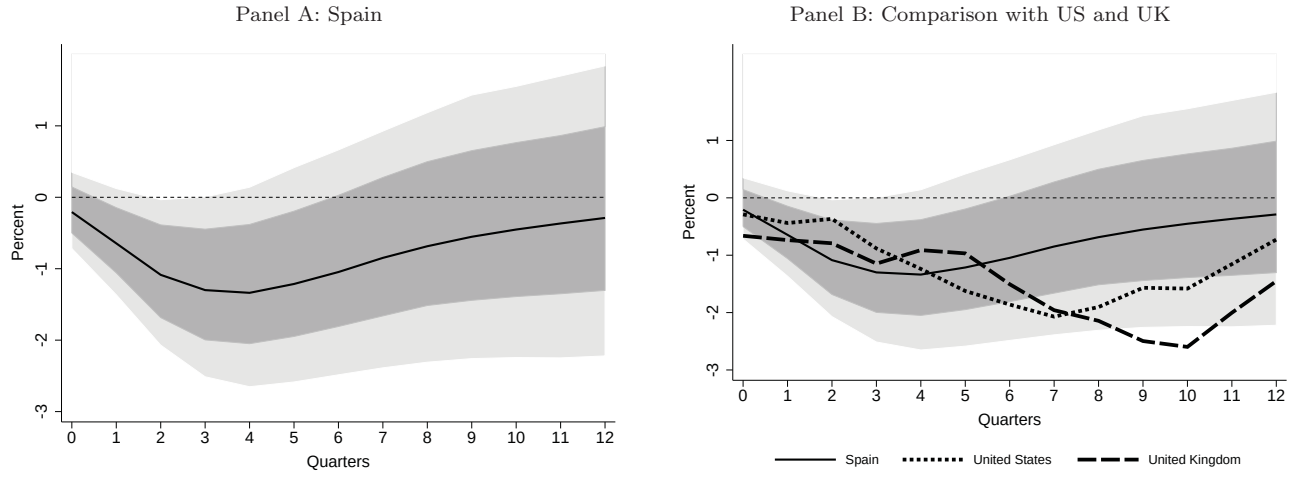
[9] To keep consistency with these studies and given the larger sample size, the VAR models are estimated with 12 lags. The US VAR comprises the sample period 1950q1:2007q4. Government spending is defined as Federal Government total expenditures minus interest payments and the interest rate is the Federal Funds rate. The UK VAR is estimated for the period 1955q1:2009q4. Government spending is defined as government consumption and the interest rate is the policy rate.

functions are estimated with considerable uncertainty and that the model specification as well as the sample periods differ, which can largely affect the comparison.

FIGURE IV

IMPACT OF AN EXOGENOUS TAX INCREASE ON GDP

BENCHMARK VAR



Notes: This figure shows the impulse-response functions of an increase of 1% of GDP in taxes on output. The model is a three-variable VAR of GDP, government spending, and the short-term interest rate, with the tax series added as an exogenous variable. 68 and 90% error bands are depicted in gray areas. The panel B compares the point estimates of panel A with those obtained using the narrative tax series and the macro variables of the US and the UK.

3.2 Effects of Two Types of Tax Changes

We now ask whether the different types of exogenous tax changes cataloged in Section 2.3 have different effects on output. We classified tax changes according to three categories: long-run reforms, changes imposed by external bodies and deficit consolidation measures (we did not categorize any tax change as "ideological change"). It must be noted though that the boundaries of such categories are sometimes blurred. For example, some of the convergence criteria established in the different European treaties leading to the single currency involved significant tax changes. Some of those measures were partly the consequence of actions by foreign institutions and partly were driven by deficit consolidation concerns (e.g. the Maastricth Treaty). Also, some bills enacted in order to bring closer the Spanish tax system to European standards were adopted not only to fulfill an external requirement, but also with the aim of increasing long-run GDP. Given these concerns, we classified each tax change according to what we think was the main motivation of the bill, acknowledging that some judgments were inevitable.

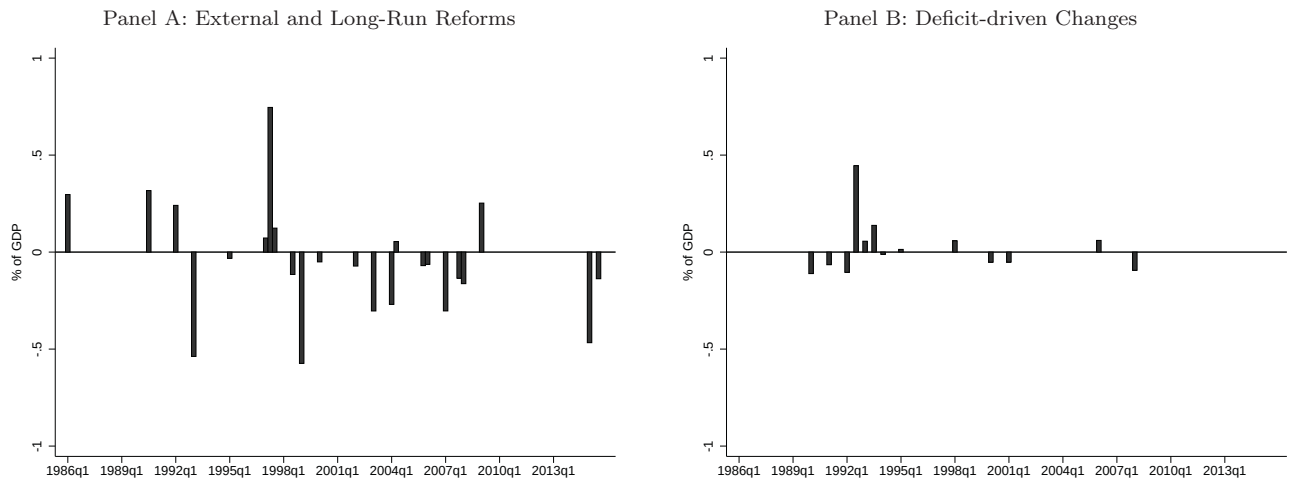
With these caveats in mind, it is worth exploring whether differently types of tax changes imply different output responses. For example, Romer and Romer (2010) find negative output effects stemming from tax changes aiming at increasing long-run growth, and zero effects of deficit-driven

tax rises. In this vein we compare two categories: external and long-run reforms, and deficit consolidation measures. We combine the two first categories because quite often they respond to the same underlying motivation. Moreover, they are more likely to be independent from the business cycle, hence this exercise allows us to test the robustness of the results to excluding measures more suspicious of suffering from endogeneity (see the discussion in Section 2.3). This is of course at the cost of reducing the number of shocks and therefore leading to more imprecise estimates. To implement this exercise, we add to the baseline VAR both types of tax changes as exogenous regressors.

Figure V shows the timeline of both categories of tax changes. There are 28 measures motivated by external bodies and long-run growth, and 17 measures motivated by the public deficit. The former are spread over the sample period, whereas the latter are concentrated in the early 1990s (note that the austerity packages adopted in 2010-2012, which were motivated by the developments of the budget balance, were excluded from the baseline estimates).

Figure V

Categories of Legislated Tax Changes

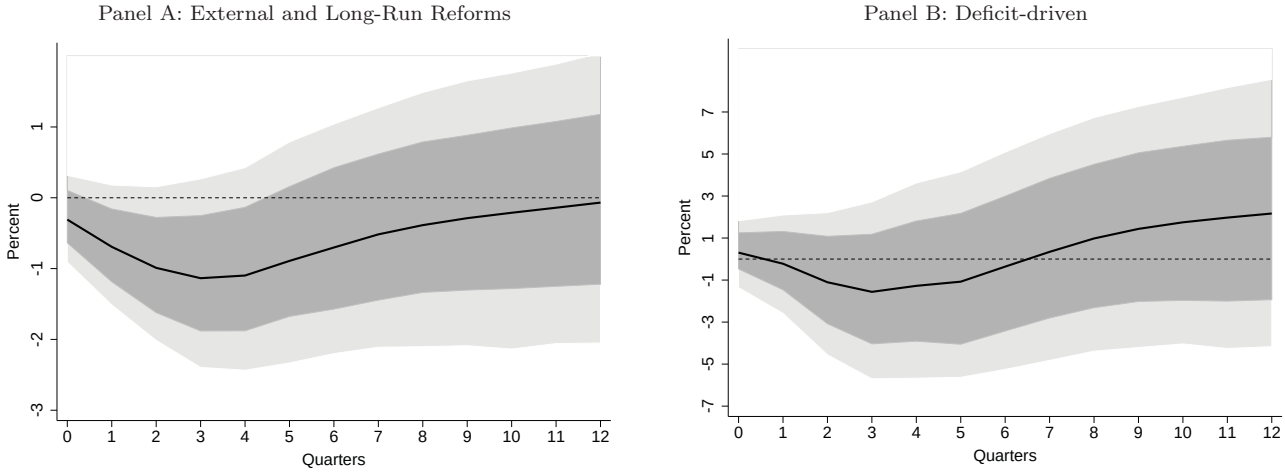


Notes: This figure shows the timeline of exogenous tax changes in the period 1986q1-2015q4, classified by motivation (i.e. a decomposition of Figure III). Panel A includes measures adopted as a requirement by external bodies, such as the European institutions, and tax changes aimed at increasing long-run GDP growth. Panel B includes measures whose main aim was to improve the budget balance.

Figure VI shows the results. We find that both categories of tax changes render similar impulse-response functions, which to some extent resemble that of the baseline. Specifically, a tax increase imposed by external institutions or motivated by long-run growth generates a fall in output of 1.1% after one year, whereas measures adopted to manage the public balance imply a GDP fall of 1.6% after 3 quarters and 1.3% after one year, with confidence bands that well encompass the former estimates. It is worth noting also that GDP recovers much faster when tax changes are adopted as a result of movements of the budget balance. In this regard, this result is consistent with Romer and Romer (2010), who find zero effects of deficit-driven tax rises.

Figure VI

Impact of Different Categories of Exogenous Tax Changes on GDP



Notes: This figure shows the impulse-response functions of an increase of 1% of GDP in taxes on output. Panel A considers tax changes motivated by external bodies and those aimed at increasing GDP in the long-run. Panel B includes only exogenous deficit consolidation measures. The model is a three-variable VAR of GDP, government spending, and the short-term interest rate, with both tax series added as exogenous variables. 68 and 90% error bands are depicted in gray areas.

3.3 Effects of Direct vs. Indirect Taxes

In this subsection we analyze to what extent direct and/or indirect taxation drive the (negative) effects of taxes on GDP we have found thus far. We define changes in direct taxes as those pertaining to the personal and corporate income taxes as well as social contributions, whereas changes in indirect taxes include the value added tax and duties on specific products.[10] Of the 45 exogenous tax changes in our dataset, 22 correspond to direct taxes and 19 to indirect taxes. In terms of the quarterly tax series, out of 30 quarters with tax changes, 18 include changes in direct taxation and 17 in indirect taxation. Regarding the motivation of the tax changes, direct tax changes are more likely to be motivated by external factors and long-run reforms, whereas indirect tax shocks are roughly evenly distributed between external and long-run reforms and deficit-driven tax changes, see Table III.

We split our tax series into changes in direct and indirect taxation, and include both variables in the VAR specification in order to take into account that they are likely to be correlated. We find that the estimated effect of an increase in direct taxes has a lower effect on output than an increase of indirect taxes, which has a large negative effect on GDP, see Figure VII. As before, we rise a flag of caution on interpreting these results at face value, given the small sample of measures on which these estimations are performed. Moreover, we found some evidence that macro developments help predict changes in indirect taxation. Having said this, it is worth stressing that they point towards more costly increases of indirect taxes.

[10] We exclude from this categorization 4 tax changes, corresponding to accounting rules, taxes on non-residents and taxes on insurance premia.

Table III

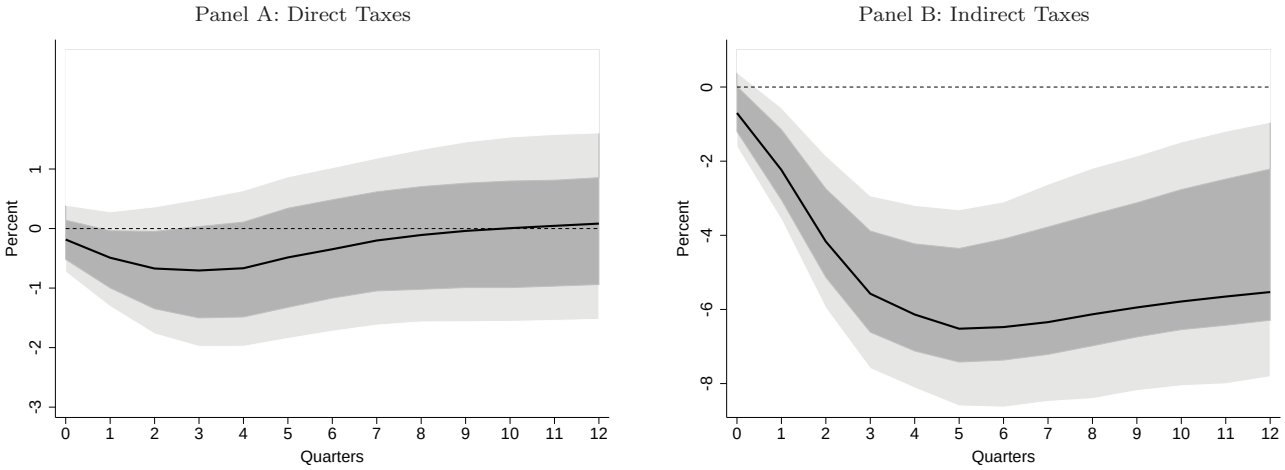
Distribution of the Motivation of Changes in Direct and Indirect Taxes

	External and Long-Run Reforms	Defict-driven Changes
Direct Taxes	15	7
Indirect Taxes	10	9

Notes: This table shows the distribution of changes in direct and indirect taxes regarding their motivation: (i) tax changes imposed by external bodies and those aiming at increasing long-run GDP, and (ii) tax changes motivated by improving the government budget. Direct taxes include the personal income tax, the corporate income tax, and social contributions. Indirect taxes comprise the value added tax and taxes on specific products.

Figure VII

Impact of Changes in Direct vs. Indirect Taxes



Notes: This figure shows the impulse-response functions of an increase of 1% of GDP in direct taxes (panel A) and indirect taxes (panel B) on output. The model is a three-variable VAR of GDP, government spending, and the short-term interest rate, with both tax series added as exogenous variables. 68 and 90% error bands are depicted in gray areas.

4 Further Results

In this section we present further results on the effect of tax policy changes. Specifically, we explore the sensitivity of the baseline estimates to including some (exogenous) measures adopted during the financial crisis and to accounting for anticipation effects. Moreover, we explore the effect of tax shocks on consumption and investment.

4.1 Including some Tax Changes Adopted during the Financial Crisis

In our baseline estimates we excluded those tax changes adopted during the period 2008-2013, on the grounds that excluding them helped the unpredictability of the tax series, see Section 2.4. Nevertheless, the period of financial turmoil that followed the Great Recession provide a useful source of identifying variation and, at least conceptually, some of the tax reforms implemented a

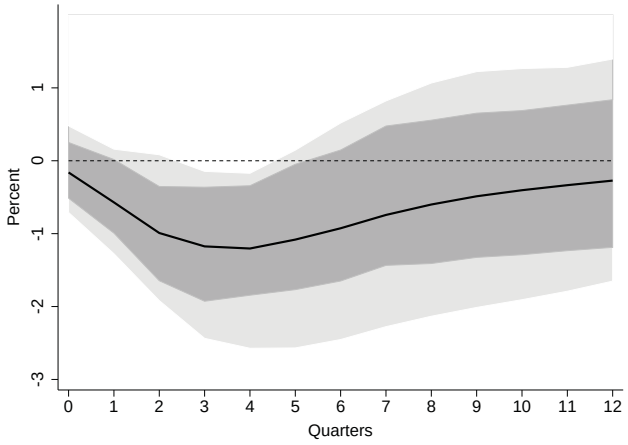
this time can be regarded as exogenous, see Section 2.3. In this section we explore the sensitivity of the baseline estimates to including such measures.

In order to do so, we repeat the baseline VAR model with the new tax series. Moreover, we add a financial crisis dummy (2008-2013) in order to capture the macroeconomic turbulence surrounding this period, see Mertens (2015).

Figure VIII shows that this has a small effect on the point estimates of the impulse-response function. We find that, following a tax increase, GDP falls by 1.2% after one year, which is 0.1 percentage points less than in the baseline. The time profile mimic also that of the benchmark results. Therefore, we conclude that the estimated negative multipliers we found in the benchmark case are robust to including the turbulent events surrounding the financial crisis.

FIGURE VIII

IMPULSE-RESPONSE FUNCTIONS INCLUDING TAX CHANGES ADOPTED IN 2008-2013



Notes: This figure shows the impulse-response functions of an increase of 1% of GDP on output. The tax series comprises the whole set of exogenous tax changes, including those adopted during the financial crisis (2008-2013). The model is a three-variable VAR of GDP, government spending, and the short-term interest rate, with the tax series added as an exogenous variable. 68 and 90% error bands are depicted in gray areas.

4.2 Excluding Anticipated Shocks

By estimating the impact of tax shocks at the implementation date rather than at the announcement date, we assumed that agents do not react to anticipated tax shocks. This is in line with the baseline specifications of Romer and Romer (2010) and Cloyne (2013), who also show a very limited role of anticipation effects. On the contrary, Mertens and Ravn (2012) find that unanticipated tax cuts, defined as measures implemented within 90 days of becoming law, give rise to significant increases in output, consumption and investment, whereas anticipated tax cuts are associated to

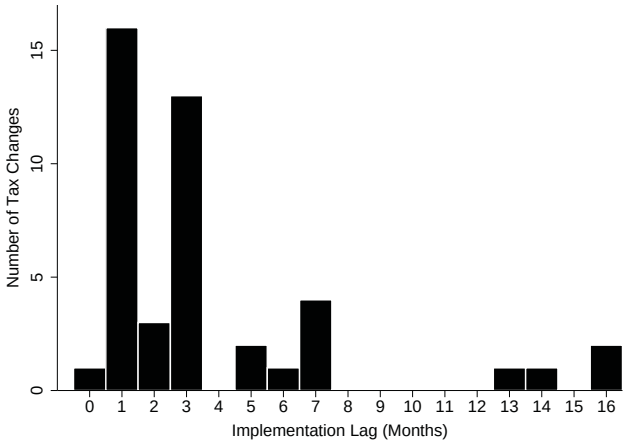
preimplementation drops in output and investment, and no changes in consumption. Once they are implemented, anticipated tax cuts are associated to increases in output and investment.

In this section we check the sensitivity of our results to anticipation effects by excluding from the exogenous tax series those shocks that were most likely to be anticipated by agents. Figure IX shows the distribution of the number of months elapsed between the announcement of each measure and its implementation, i.e. the implementation lag. We assign the date of the announcement either to the month the tax change became law or when it was publicly announced provided that the uncertainty regarding its implementation was low. We can see that the majority of tax changes are implemented one month after the announcement. Also, many tax changes have an implementation lag of three months. Note that we include here those measures introduced in the project of the budget law, usually presented on 30 September, and taking effect on January 1st.

Figure IX

Distribution of the Implementation Lag

Exogenous Tax Changes

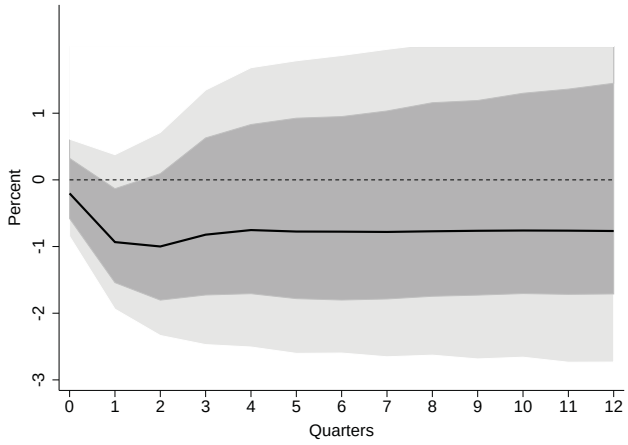


Notes: This figure shows the distribution of the number of months elapsed between the announcement of each tax change and its implementation, i.e. the implementation lag. The date of announcement is assigned either to the month the tax change becomes law or when it is publicly announced if the uncertainty regarding their implementation is low.

We therefore repeat the VAR specification but excluding those changes with an implementation lag higher than 3 months. This is consistent with Mertens and Ravn (2012), whose criteria is an implementation lag lower than 90 days. This proceeding leads to excluding 11 tax changes, hence reducing the source of variation to 33 tax shocks. Figure X shows that after an unanticipated tax increase of 1% of GDP, output falls by 1% in the short-term, afterward recovering only slightly and eventually yielding a permanent GDP loss of 0.8%. One must note that there is considerable uncertainty regarding these estimates, with wide confidence bands that encompass well the zero effect after 2 quarters, hence we exert caution in reading these results.

Figure X

Impact of an Exogenous Tax Increase on GDP
Excluding Anticipated Shocks



Notes: This figure shows the impulse-response functions of an unanticipated tax increase of 1% of GDP on output. The model is a three-variable VAR of GDP, government spending, and the short-term interest rate, with the tax series added as an exogenous variable. The tax series excludes anticipated tax changes, defined as those whose implementation lag (the number of months elapsed from announcement to implementation) is higher than 3 months, as well as those measures adopted during the financial crisis (2008-2013). 68 and 90% error bands are depicted in gray areas.

We carried out two additional exercises with regard to anticipation effects. First, some of the tax measures were explicitly legislated to be temporary. These measures, opposite to permanent changes in tax liabilities, would trigger a milder reaction if agents follow the permanent income hypothesis. We therefore re estimated our baseline VAR excluding these temporary measures, which implies the suppression of 7 exogenous tax changes. The estimated effect is slightly lower than the baseline. After an increase of taxes, output falls by 1.0% after 4 quarters, which is 0.2 percentage points less than in the baseline, gradually converging toward zero from that quarter on. Nevertheless, inspecting the confidence bands of these and the baseline estimates, we conclude that these differences are not statistically significant.

Second, we analyze the output effects of tax changes at announcement date, rather than at implementation date. Specifically, we compute the cumulative yearly revenue effect of each tax change and assign it to the date of announcement.[11] We then estimate the effect on output of this new tax series. We find lower effects with respect to the baseline estimates. GDP falls by 0.5% in the first 2 quarters and rapidly converges towards zero and even positive estimates, with the

[11] Note that this procedure implies the exclusion of temporary measures, whose cumulative effect is zero. Note also that we assign to the next quarter those measures announced in the last month of a quarter.

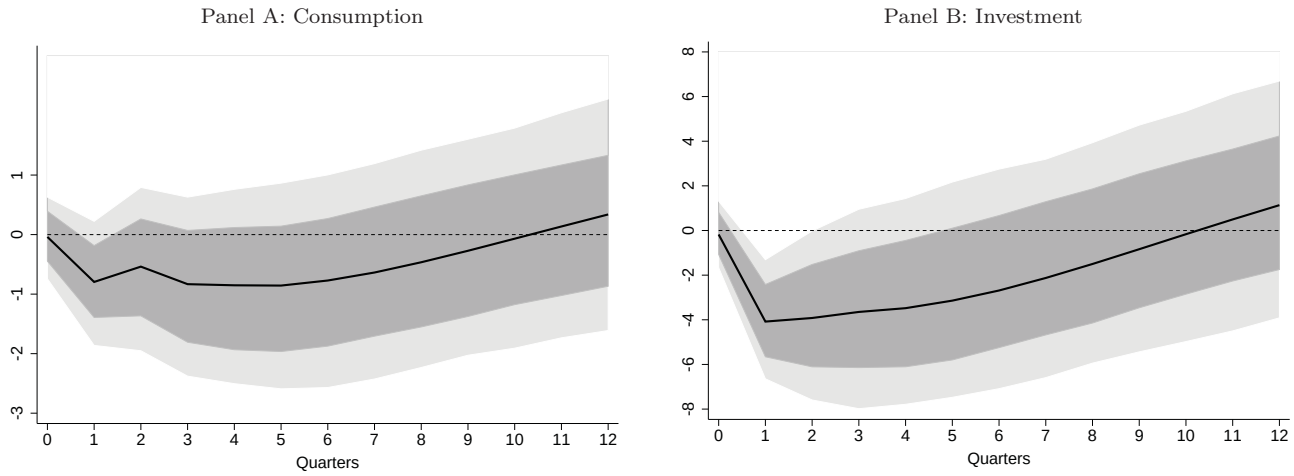
one-standard error confidence bands encompassing the zero-effect at all horizons. Therefore, this exercise suggests that the output effects of tax changes are stronger when they are implemented compared to when they are announced. Hence, anticipation effects may not be crucial when accounting for the effect of Spanish tax changes, at least to a first approximation. It must be noted though that the announcement date is subject to measurement error, as agents can well anticipate tax changes before legislation is passed. Therefore, one must be cautious in interpreting this result.

4.3 Effects of Tax Changes on Consumption and Investment

In this section we analyze the effects of tax shocks on private consumption and investment by adding these two variables to the baseline VAR described in equation (1).[12] We find that following a tax increase, both consumption and investment fall in the short-term, then they recover to their original levels at larger horizons. After one year, consumption decreases by 0.9% after one year, whereas the fall in investment is much sharper, 4% after 1 quarter and 3.5% after one year. Again, there is considerable uncertainty surrounding these estimates but, overall, they suggest that following a tax increase, investment reacts more than consumption, a result that goes in line with a similar finding by Cloyne (2013) from the UK.

FIGURE XI

IMPACT OF AN EXOGENOUS TAX INCREASE ON GDP ON PRIVATE CONSUMPTION AND INVESTMENT



Notes: This figure shows the effect of an increase of 1% of GDP on private consumption (panel A) and investment (panel B). The model is a five-variable VAR of GDP, consumption, investment, government spending, and the short-term interest rate, with the narrative tax series added as exogenous variables. 68 and 90% error bands are depicted in gray areas.

[12] In this case, the information criteria suggests a lag order of 2.

5 Conclusions

This paper makes two contributions. First, it presents a newly constructed narrative dataset of legislated tax changes adopted in Spain during the period 1986-2015. Second, we use the tax measures whose motivation is not to offset macro shocks in order to estimate the GDP impact of tax changes. In this regard, this paper can be framed in an emerging literature that applies the narrative approach to assess the impact of tax changes on output. This literature was started by Romer and Romer (2010) and went on with further applications for the US and a few European countries. The use of narrative methods provide a credible source of identification by overcoming the traditional problem of finding a source of exogenous variation in tax policies.

Overall, our estimates point towards negative effects from tax increases in Spain. Our baseline result shows that following a 1% of GDP increase in taxes, output falls by 1.3% after one year, the negative effects fading away over time. Focusing on changes in indirect taxes and on investment yield higher falls in output. We also note that the estimates are subject to non-negligible uncertainty, as confidence bands are wide.

The narrative literature applied to tax policy has experienced significant developments during the last years. For example, important contributions have been made on regime-dependent multipliers (Auerbach and Gorodnichenko (2012)) and on reconciliating the results obtained from narrative vs. SVAR approaches, see for example Favero and Giavazzi (2012) and Mertens and Ravn (2013). We think that further research can bring the new narrative dataset of Spain to this frameworks in order to improve the estimation of the impact of tax shocks. Given the protracted euro area public debt crisis and the lingering fiscal consolidation needs in several countries, understanding the effects of fiscal policy on macroeconomic developments remains a crucial issue in order to promote growth and achieve fiscal sustainability.

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Appendix to: The Output Effects of Tax Changes: Narrative Evidence from Spain

A Overview of Legislated Tax Changes in Spain

In this section, we provide a brief overview of the tax changes recorded in our narrative dataset. We put special emphasis on the motivation behind the measures, as well as the macroeconomic conditions under which they were adopted. Macro figures correspond to initial estimates, taken from the Monthly Bulletin of Banco de España and other sources. See Figure I in the main text for a timeline of the recorded tax changes in the period 1986-2015.

1986

The first measure recorded in our dataset is the introduction of the value added tax (VAT) in 1986q1. It replaced a large and complex set of taxes (for example, a tax on firm operations in force since 1964), hence it simplified enormously the system of indirect taxes in Spain. The introduction of the value added tax was a requirement to join the European Economic Community, which provided rules to harmonize the indirect taxation system across member states. The accession took place in 1986.

1990-1991

No significant changes in the tax code were implemented until 1990. In 1990-1991 there were some small changes in the personal income tax stemming from the automatic extension of the 1989 budget law (due to the the early general elections of October 1989, which prevented the budget of 1990 to be approved), and the adjustment of income tranches and withholdings. There were also two increases in duties on fuels, one in 1990q3, aimed at compensating the loss in revenue from the liberalization of the oil industry, and another in 1991q1. Overall, taxes increased by 0.2% of GDP in 1990 and decreased by 0.1% in 1991.

1992

In 1992 there were significant tax reforms. In June 1991 the government passed a reform on the personal income tax, to be implemented in 1992. It was motivated by a sentence of the Constitutional Court, who deemed unconstitutional some articles of the original law of 1979 and 1985. The reform had a negative (ex-ante) impact on revenue of around 0.2% of GDP in 1992 and 0.5% in 1993. The government also passed two increases in the value added tax, one in the budget law of 1992 and another in 1992q3. These two increases were adopted in the context of the Treaty on European Union (TEU) or Maastricht Treaty, drafted in December 1991 and approved in February 1992. The treaty established convergence criteria to be fulfilled by 1996 in order to integrate in the third and last phase of the Economic and Monetary Union (EMU), to start between 1997 and 1999, leading to the creation of the single currency. These convergence criteria comprised

inflation, public debt, public deficit, exchange rates and interest rates. Therefore, the budget law of 1992 was drafted to help achieve these convergence criteria, and, given a slippage of public deficit in the first semester of 1992, the government approved an additional increase of the value added tax in July 1992. Although at the time of the TEU GDP was decelerating (annual growth was around 2.5%), the main motivation behind the value added tax increase of 1992q3 was to bring down the public deficit, as stated in the motivation of the law. In fact, the convergence plan presented by Spain in 1992 projected GDP growth to be 3.5% in 1992-1996, above the European average of 2.5%. The budget law of 1992 introduced two additional tax increases: on fuels and on social contributions paid on behalf of the unemployed. Overall, the 1992 measures increased tax liabilities by 0.6% of GDP.

1993

In 1993q1 there were several tax changes. First, as a consequence of the process of harmonization of the European indirect tax codes, the government reduced the value added tax and, at the same time, created a new tax on transports. It also kept unchanged the real rates on fuels, leading to a decrease in revenue in a context of high inflation (6.5%). The government also increased social contributions in the budget law of 1993. Finally, the personal income tax reform of 1991 had an effect in 1993q1. These measures were implemented in a context of falling activity, both in Spain and in Europe. GDP growth in Spain averaged 4.5% in 1988-1990, 1% in 1991-1993, and GDP fell by 1% in 1993. However, they were not taken with an explicit counter cyclical motive. Rather, they responded to European directives, past reforms, and the needs of the Social Security. Policy makers used mainly the monetary policy to foster activity (successive currency devaluations and reductions in interest rates). The government adopted an additional fiscal measure in 1993q3: an increase in duties on fuels, due to a perceived deterioration of revenues.

1994-1995

In 1994-1995, as Spain emerged from the recession, four tax measures were taken, all introduced in the corresponding budget laws. These four measures annihilated each other, hence their impact on revenues was very low. The budget of 1994 kept unchanged the rate on fuels, leading to a loss in revenue, and it introduced a new levy on unemployment benefits. In 1995, Spain underwent a process of fiscal devaluation. The value added tax increased and social contributions were decreased by the same amount, therefore the ex-ante effect on the budget was neutral.

1996-1998

Between 1996 and 1998 several tax measures were adopted, increasing revenue by 1% overall. The main goal was to modernize the tax system and to adapt it to the European standards. In

December 1995 the corporate income tax was reformed, with the aim of improving the computation of the tax base, adapting it to the 1991 personal income tax reform, and dealing better with an increasing influx of capital. Moreover, the new government elected in 1996 increased corporate tax payments on account in the budget law of 1997. Both measures increased revenue by 0.8% of GDP. Also, the new government approved in June 1996 an update on the book value of assets held by firms, leading to a small increase in revenue in 1997. It also created a new tax on insurance premia in September, in order to fulfill European requirements. This tax had a first impact in 1997q1, and was increased one year later. In 1998, the cabinet introduced a new tax on electricity in order to finance some funding for the mining industry.

1999

In December 1998 the government passed an important overhaul of the personal income tax, following an experts' commission who had been gathered in February 1997. The reform affected both residents and non-residents, and was adopted in the context of the accession to the third phase of the EMU, starting in January 1999, that would lead to the implementation of the common monetary policy and the introduction of the euro. The most important feature was the introduction of an exempt minimum income, with an overall decrease in revenues of 0.6% of GDP.

2000-2002

In 2000-2001 the government implicitly adopted small tax decreases, stemming from the failure to update the rates on fuels, which were applied on real quantities in the context of inflation rates above 3%. In 2002 the government passed four measures. First, it created a new duty on fuels, compensating the revenue losses of the previous two years. This new duty was transferred to the regions, and had the aim of financing health expenditure, after the completion in 2001 of the process of decentralization of the health system. Later on in 2014 the Court of Justice of the European Union would invalidate this new duty, and would order the reimbursement of collections. Second, it reduced social contributions of workers above 60 years old, following a social agreement in April 2001, motivated by the need to extend the working career of individuals. Third, it reduced corporate income taxes. This reform was introduced in the same bill as the new duty on fuels, partly with a counter-cyclical motivation. The bill stated that this tax change was aimed at fostering growth and employment, in order to counter a slowing-down of the economy. Indeed year-on-year GDP growth was mildly decelerating, from 4.1% in 2000 (the same rate as in 1999), to 3.2%, 2.9%, and 2.6% in 2001q1, 2001q2, and 2001q3, respectively. Moreover, this deceleration of activity prompted the government to approve a labor market reform in May 2002, which increased flexibility in the labor market and reduced unemployment benefits. However, it was revoked in October 2002 after a general strike the following month it was passed.

2003-2004

In 2003 the cabinet approved a second major reform of the personal income tax, following the one of 1998. The goal of the reform was to increase long-run growth and adapt the tax code to the introduction of the physical euro in January 2002. The reform consisted mainly on a reduction of marginal tax rates and tranches, an increase in the exempt minimum income, a widening of some deductions, and a modification of withholdings. The macroeconomic conditions at the time were benevolent. GDP growth, at around 2%, was below the average of previous years, but the perception was that it was behaving comparatively well among an uncertain environment. For instance, euro area growth in 2002 was expected to be below 1%. The reform of the personal income tax had differential effects in 2003 and 2004, and also had a mild impact on the corporate income tax, due to the linkages between both taxes. On the Social Security, the government adopted a small increase in social contributions of the self-employed in 2004q1. Overall, the changes on direct taxation negatively impacted revenues by 0.3% of GDP in both 2003 and 2004.

2005-2006

The new government elected in March 2004 approved small changes in indirect taxation in 2005 and 2006. In 2005 it adopted two measures on the value added tax. First, it modified the tax code on deductions, due to a sentence of the Court of Justice of the European Union. And second, it approved a front-loading of value added tax rebates. In 2006, for public health reasons, the government raised the duties on tobacco, in order to induce a price increase.

2007

The main reform during the first term of the government elected in 2004 was a significant overhaul of direct taxation, implemented in 2007. It affected both personal and corporate income taxes, and it was passed in a single bill in November 2006. On the personal income tax, the reform reduced tranches and tax rates, and increased the savings tax rate. On corporate taxation, it reduced gradually marginal tax rates in 2006 and 2007. The motivation of the reform, as stated by the bill, was to increase equity, achieve sustainable growth, homogenize the tax rate on savings, and improve the competitiveness of Spanish firms. The economic conjuncture was benign. GDP growth was close to 4% and the unemployment rate reached a floor at 8.3% in September 2006. Also in November 2006 the cabinet passed a bill aimed at preventing fiscal fraud. The law created a new regime on value added tax for holdings, and was implemented in 2008q1. In November 2007 the government introduced an income tax deduction on births and adoptions, in order to tackle population aging and provide support for families. Overall, tax liabilities were decreased by 0.5% of GDP in 2007.

2008-2009

In the second half of 2007 there started to appear the first signs of a change in the business cycle. Year-on-year GDP growth in the second half of 2007 averaged around 3.6%, slightly less than the 4% growth in the first half of the year. The economic situation deteriorated during the first months of 2008, amid a slowdown of activity in the United States, turbulences in financial markets, rising commodity prices and difficulties in the construction sector. Activity decelerated to 0.3% in 2008q1 with respect to the previous quarter, versus the growth of 0.8% posted in the last quarter of 2007. In the budget law of 2008, the government introduced small tax decreases in the personal income tax and the value added tax. However, it did not adopt counter cyclical measures until April 2008, when it approved a fiscal stimulus package of around 1% of GDP. It consisted mainly on four changes, having an effect in 2008 and 2009. First, a tax rebate of €400 for labor income earners. Second, a modification of corporate income taxes to increase the liquidity of firms. Third, the repeal of a tax on wealth. And fourth, a front loading of value added tax rebates also in order to improve firms' liquidity. Additional to this stimulus package, in March 2009 the cabinet approved a temporary reduction in employers' social security contributions in order to support employment. This measure responded to a sharp worsening of the labor market. Indeed, the unemployment rate had reached 14.8% in January 2009, up from 9.0% one year earlier. Apart from the stimulus package, several tax measures approved in previous years had an impact in this period, namely the reform on direct taxation and the bill preventing fiscal fraud. Overall, in 2008 and in the first quarter of 2009 taxes decreased by around 2.1% of GDP. In the remaining quarters of 2009, taxes increased by close to 0.4% of GDP. This was the result of the temporary nature of some of the measures to improve the liquidity of firms, and of an increase in excise duties (tobacco and fuels), justified by health and environmental reasons.

2010

2010 was a year of overall tax increases, due to the expiration of some of the stimulus measures adopted in 2008, and two tax increases passed in the budget law as a consequence of growing concerns on the public deficit. Indeed, since March 2009 there were some signs of stabilization in global financial markets and in the pace of falling activity in Spain, which prompted a slight upward revision of expectations towards the last quarter of 2009. For example, in Autumn 2009 the European Commission revised up its forecast of Spanish GDP growth to -0.8% in 2010, from the -1% projected in Spring. It also projected positive GDP growth of 1% in 2012. However, the notorious deterioration of the public finances was a matter of increasing distress. For instance, in October 2009 the Monthly Bulletin of Banco de España projected public deficit to be around 10% of GDP at year-end (vs. 3.8% in 2008), due to the stimulus packages of the previous years, the recession and the lower tax receipts from the construction industry. This worsening of the budget balance prompted the government to change the course of fiscal policy. In the draft budget

of 2010 it adopted two austerity measures: the suppression of the tax rebate of €400 for labor income earners, and an increase in the VAT to be implemented in July 2010. These, added to the reversion of some of the stimulus measures implemented in 2008-2009 (on favoring the liquidity of firms and supporting the labor market) led to an overall tax increase of 1.3% of GDP in 2010. The further deterioration of the public deficit, a sharp increase in the risk premium, and pressures stemming from euro area partners, led the government to adopt further measures in May 2010, namely a decrease in public wages, a pension freeze, and the suppression of the deduction on births and adoptions approved in 2007. As a result of the 2010 measures, taxes increased a further 0.3% of GDP in early 2011.

2011

Economic activity in the first half of 2011 showed signs of recovery, although at a slow pace. Quarter-on-quarter GDP growth in 2010q4 and 2011q1 was 0.2% and 0.3%, respectively. Global activity was also recovering, although several uncertainties remained. In the euro area, despite a gradual stabilization of global financial markets, several countries were under financial distress, especially Greece, Ireland and Portugal. Business conditions deteriorated significantly in July, when the financial turmoil extended to Italy and Spain. Indeed, the Spanish risk premium jumped to close to 400 basis points in July, amid concerns on the budget balance and the public debt. The worsening of the financial crisis prompted the European governments to improve the fiscal framework of the euro area in leading with the sovereign debt crisis, as well as to approve a new program for Greece. Later on, in August, the European Central Bank (ECB) started to buy Italian and Spanish bonds, in order to to prop up prices. In this context, the Spanish government approved a fiscal package in August, after increasing pressure from the ECB. On the revenue side, two measures were adopted: a front loading of corporate tax payments of large firms, and a temporary reduction in taxes associated to home purchases in order to sustain the construction sector. On the expenditure side, it approved a reduction on pharmaceutical spending. Moreover, before the general elections due in November, the government approved the restoration of a tax on wealth, repealed in 2008, in order to raise revenue. On the institutional side, the main political parties agreed in early September to introduce the principle of budget stability in the Constitution. Overall, tax changes in 2011 amounted to 0.4% of GDP.

2012

Just a few days after a new government had taken office, in mid December 2011, the cabinet approved a set of fiscal measures in order to correct the expected deviation of the budget balance from the targets set by the European Union, of around 2 percentage points of GDP (the first estimate, released in February 2012, yielded a public deficit of 8.5% of GDP in 2011 vs. a target

of 6%). The most important tax change was an increase of the personal income tax. Later on, when the deviation materialized in March 2012, the cabinet introduced further measures on the corporate income tax, namely the suppression of deductions and an increase in taxes. Overall, the size of these two packages was approximately 0.75% of GDP in the first half of 2012. Starting in May, financial tensions increased substantially due to the growing concerns on the health of the financial sector and on the budget balance, amid the backdrop of the euro area sovereign debt crisis. In July, the Spanish risk premium soared to above 600 basis points, yields on 10-year government bonds were at around 7%, and the stock market had fallen by around 20% since the beginning of the year. On 9 June, the Eurogroup agreed to give a special loan to the government in order to recapitalize the financial sector, of up to €100 billion. On 10 July, the ECOFIN extended one year (to 2014) the deadline to bring the public deficit below 3%, setting a new target of 6.3% in 2012. The need to reduce the public deficit led the government to pass a new fiscal austerity package in July. On the tax side, it increased the value added tax, to be effective in September. It also increased the corporate income tax for large firms, reduced tax credits from previous exercises, and increased the tax base. On the personal income tax, it approved an increase in withholdings and the suppression of the deduction on house purchases from 2013 onwards. Overall, tax liabilities increased by 1.1% of GDP in the second half of 2012. These tax increases were complemented by some reductions in public expenditure, among other a decrease in public wages and a reduction in unemployment benefits.

2013-2014

In 2013 there was a further net increase of taxes of around 0.2% of GDP, although no significant measures were adopted, and the fiscal stance stopped being restrictive. The small tax increases stemmed from two sources. First, three measures adopted at the end of 2012: an increase in social contributions for high-income earners, a reduction in deductions in the corporate income tax, and a small increase in the tax base of corporate taxes. An second, the impact of measures adopted in the previous years, among others, the restoration of a tax on wealth, the suppression of the deduction on home purchases, and increases in corporate income taxes. The macroeconomic situation in 2013 improved slightly, with significant decreases in the risk premium and reductions in the volatility of financial markets. Real GDP kept contracting during the first half of the year, although at a slower pace: quarter-on-quarter GDP growth amounted to -0.4% in 2013q1 and -0.1% in 2013q2, vs -0.8% in 2012q4. Later on, it would gradually gain speed, posting +0.1% in 2013q3 and 0.2% in 2013q4. In 2014 there were additional small fiscal measures. The government approved at the end of 2013 a further increase in social contributions of high-income earners, and an increase in the tax base of social contributions by including payments in kind and by modifying payroll taxes of the self-employed. The macroeconomic conditions in 2014 improved further, with GDP growing at around 0.5% quarter-on-quarter during the year and employment increasing at close to 2% at year-end.

2015

In the context of the economic recovery and ahead of an electoral year, the government approved in late 2014 an important tax decrease in both the personal and the corporate income tax, to be implemented in 2015 and 2016, consisting mainly on a reduction on marginal tax rates and a modification of tax bases and deductions. Later on, in July 2015 the government brought forward the part of the reform initially set to be implemented in 2016. This decision was taken under solid growth rates (year-on-year growth approached 3% in the first half of the year) and in the context of forthcoming general elections, which would take place in December. Overall, taxes decreased by 0.9% of GDP in 2015.

B List of Legislated Tax Changes

Table A.I

List of Legislated Tax Changes

Type	Announcement	First Impact	Description (in Spanish)	Exog.	Cumulative Impact	Perm/Temp	Source
VAT	02-Aug-85	1986q1	Introducción del IVA (tipos 6%, 12% y 33%) en sustitución del ITE, CGI y del impuesto sobre el lujo	External	0.30	Permanent	Ley 30/1985.
PIT	29-Dec-89	1990q1	Deflactación tarifa y retenciones	Consolidation	-0.16	Permanent	RDL 7/1989.
PIT	29-Dec-89	1990q1	Retraso en ajustar retenciones del trabajo a las modificaciones introducidas por el Real Decreto-ley 7/1989, de 29 de diciembre.	Consolidation	0.00	Temporary	RD 1009/1990.
ED	30-Dec-89	1990q1	No se modifican los tipos, excepto la introducción de gasolina sin Pb a menor tipo, (frente a una var. IPC del 6,7%) hidrocarburos	Consolidation	-0.08	Permanent	RDL 7/1989.
ED	06-Jul-90	1990q3	Incremento de los tipos de gravamen (en torno al 20%) hidrocarburos	Long-run	0.32	Permanent	RDL 3/1990.
ED	30-Sep-90	1991q1	Incremento de los tipos de gravamen (en torno al 14%, frente a una var. IPC del 5,9%) hidrocarburos	Consolidation	0.12	Permanent	Ley 31/1990
PIT	20-Dec-90	1991q1	Retraso en ajustar retenciones del trabajo a las modificaciones introducidas por el RDL 5/1990, de 20 de diciembre, de Medidas Fiscales Urgentes.	Consolidation	0.00	Temporary	R 717/1991.
PIT	20-Dec-90	1991q1	Deflactación tarifa	Consolidation	-0.18	Permanent	RDL 5/1990.
PIT	06-Jun-91	1992q1	Nueva Ley IRPF, por la sentencia del TC 45/1989 sobre tributación conjunta	External	-0.70	Permanent	Ley 18/1991.
SIC	30-Sep-91	1992q1	Subida tipo desempleo del 7,40% al 8,40%	External	0.09	Permanent	Ley 31/1991.
VAT	30-Sep-91	1992q1	Aumento de tipos impositivo: del 12% al 13% y 33% al 28%	External	0.18	Permanent	LEY 31/1991.
ED	30-Sep-91	1992q1	Incremento de los tipos de gravamen (en torno al 15%, frente a una var. IPC del 5,9%) hidrocarburos	External	0.13	Permanent	Ley 31/1991.
VAT	21-Jul-92	1992q3	Aumento del tipo impositivo: del 13% al 15%	Consolidation	0.45	Permanent	RDL 5/1992.
VAT	21-Jul-92	1993q1	Supresión del tipo incrementado (28% al 15%: se crea el impuesto determinados medios transporte) y establece un tipo superreducido del 3%	External	-0.21	Permanent	Ley 37/1992.
SIC	30-Sep-92	1993q1	Subida tipo RG del 28,80% al 29,30% y autónomos del 28,64% al 28,80%	Consolidation	0.13	Permanent	Ley 39/1992.
ED	28-Dec-92	1993q1	Crea el Impuesto sobre determinados medios de transporte, como respuesta a la supresión del tipo incrementado del IVA (28% al 15%), al tipo del 13%	External	0.18	Permanent	Ley 38/1992.
ED	30-Dec-92	1993q1	No se modifican los tipos (frente a una var. IPC del 4,6%) hidrocarburos	Consolidation	-0.07	Permanent	BdE.
ED	04-Aug-93	1993q3	Incremento de los tipos de gravamen (en torno al 9%) a partir de agosto hidrocarburos	Consolidation	0.14	Permanent	RDL 13/1993.

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List of Legislated Tax Changes (Continued)

Type	Announcement	First Impact	Description (in Spanish)	Exogeneity	Cumulative Impact	Perm/Temp	Source
PIT	30-Sep-93	1994q1	Sujeta a tributación las prestaciones por desempleo	Consolidation	0.08	Permanent	Ley 21/1993.
ED	30-Sep-93	1994q1	No se modifican los tipos, excepto fuéloleos (frente a una var. IPC del 4,7%) hidrocarburos	Consolidation	-0.08	Permanent	BdE. Ley 21/1993.
VAT	30-Sep-94	1995q1	Se elevan en un punto todos los tipos impositivos: 4% [3%], 7% [6%] y 16% [15%]	Long-run	0.23	Permanent	Ley 41/1994.
SIC	30-Sep-94	1995q1	Rebaja tipo RG del 29,30% al 28,30%, autónomos del 28,80% al 28,30%. Se compensa con subida IVA	Long-run	-0.26	Permanent	Ley 41/1994.
O	30-Sep-96	1997q1	Instauración del impuesto sobre primas de seguro	External	0.07	Permanent	Ley 13/1996.
CIT	27-Dec-95	1997q2	Nueva Ley IS más elevación porcentajes de pagos a cuenta al 18% [15%] ó 25% [20%], según que se tome como base la cuota del período anterior o la del ejercicio en curso	Long-run	0.75	Permanent	Ley 43/1995.. Ley 12/1996.
O	07-Jun-96	1997q3	Actualización balances	Long-run	0.00	Temporary	RDL 7/1996.
O	30-Sep-97	1998q1	Elevación del tipo del impuesto al 6% [4%] sobre primas de seguro	Consolidation	0.06	Permanent	Ley 65/1997.
ED	30-Dec-97	1998q1	Crea un impuesto (vinculado a la asunción por el Estado de un nuevo gasto enrelación con el apoyo a la minería del carbón) sobre le electricidad	Endogeneous	0.10	Permanent	Ley 66/1997.
PIT	08-Dec-98	1999q1	Reforma del IRPF aproximando la base imponible a la renta disponible mediante la introducción en la base del mínimo vital	Long-run	-0.79	Permanent	LEY 40/1998.
O	09-Dec-98	1999q1	Instauración independiente de la tributación de no residentes	Long-run	0.16	Permanent	Ley 41/1998.
ED	30-Dec-99	2000q1	No se modifican los tipos (frente a una var. IPC del 3,4%) hidrocarburos	Consolidation	-0.05	Permanent	BdE.
ED	30-Dec-00	2001q1	No se modifican los tipos (frente a una var. IPC del 3,6%) hidrocarburos	Consolidation	-0.05	Permanent	BdE.
SIC	27-Dec-01	2002q1	Reducción de cotizaciones para trabajadores mayores de 60 y de 65 aos y contratación de mujeres hasta 24 meses después de dar a luz	Long-run	-0.22	Permanent	RDL 16/2001.Ley 35/2002.
CIT	24-Dec-01	2002q2	Rebaja al 18% [35%] la tributación de las plusvalías empresariales acumuladas que se reinviertan en un período de 4 aos	Endogeneous	-0.23	Permanent	Ley 24/2001.
ED	27-Dec-01	2002q2	Implantación del Impuesto sobre ventas minoristas (céntimo sanitario, que se integra en Especial Hidrocarburos en 2013, libro amarillo PGE2013 -pág. 38- y se devuelve como TrfCapPagos en 2014) hidrocarburos	Endogeneous	0.14	Permanent	Ley 24/2001.

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List of Legislated Tax Changes (Continued)

Type	Announcement	First Impact	Description (in Spanish)	Exogeneity	Cumulative Impact	Perm/Temp	Source
PIT	28-Jun-02	2003q1	Obligatoriedad del ingreso mensual de retenciones del trabajo para AAPP con presupuesto ¿ 6 mill.	Long-run	0.00	Temporary	RD 594/2002.
PIT	18-Dec-02	2003q1	Reduce tramos (a 5 [6]) y tipos (máx. 45% [48%] y mín. 15% [18%]), aumenta los mínimos vitales, nuevas deducciones para ¿75 aos y transparencia fiscal	Long-run	-0.51	Permanent	LEY 46/2002.
SIC	30-Sep-03	2004q1	Subida tipo autónomos del 28,30% al 29,80%	Long-run	0.05	Permanent	LEY 61/2003.
CIT	18-Dec-02	2004q2	Traspaso del IRPF por transparencia fiscal	Long-run	0.05	Permanent	LEY 46/2002.
VAT	06-Oct-05	2005q4	No hay que aplicar la regla de prorrata por el exclusivo hecho de recibir subvenciones de capital, o de explotación no vinculadas a precios	External	0.00	Temporary	Sentencia TJCE, 6 de octubre de 2005.
ED	10-Feb-06	2006q1	Incremento de los tipos (desde 11 febrero) específico y "ad valorem" de gravamen (54,95% al 57,0%) tabaco	Consolidation	0.06	Permanent	RDL 2/2006.
VAT		2006q1	Adelanto permanente de devoluciones	Long-run	0.00	Temporary	AEAT.
PIT	28-Nov-06	2007q1	Reduce tramos (a 4 [5]) y tipos (máx. 43% [45%]), mínimos vitales no minoran la base sino van a la tarifa, se eleva el tipo (al 18%) sobre la renta del ahorro	Long-run	-0.33	Permanent	Ley 35/2006.
CIT	28-Nov-06	2007q2	Reduce gradualmente el tipo general en dos aos del 35%, al 32,5% y al 30%. El tipo para PYME baja en un ao al 30% (al 25% para los primeros 120.202,41)	Endogeneous	-0.68	Permanent	LEY 35/2006.
PIT	15-Nov-07	2007q4	Devoluciones anticipadas (aplicable a nacimientos desde 01/07/2007, que se suprime en 2011) del Plan CUNA	Long-run	-0.13	Permanent	Ley 35/2007.
VAT	29-Nov-06	2008q1	Se crea un nuevo régimen especial de declaración para grupos consolidados	Long-run	0.00	Temporary	Ley 36/2006.
PIT	30-Sep-07	2008q1	Deflactación de la tarifa, mínimos personales y familiares y rendm. trabajo	Consolidation	-0.09	Permanent	Ley 51/2007.
PIT	18-Apr-08	2008q2	Implanta una nueva deducción (que se suprime en 2010) de 400 para perceptores de rentas del trabajo	Endogeneous	-0.54	Permanent	RDL 2/2008.
CIT	21-Apr-08	2008q2	Opción (para GE) de efectuar los pagos fraccionados del 2008 en funciónde la cuota del ao anterior, o tomar como referencia la parte de base imponible a lo largo del 2008	Endogeneous	0.00	Temporary	RDL 2/2008.
O	23-Dec-08	2009q1	Los tipos del Impuesto quedan en cero	Endogeneous	-0.21	Permanent	Ley 4/2008.
VAT	23-Dec-08	2009q1	Las empresas podrán optar por recibir mensualmente la devolución de IVA	Endogeneous	0.00	Temporary	Ley 4/2008.
SIC	06-Mar-09	2009q1	Bonificación cuotas empresariales por creación empleo	Endogeneous	0.00	Temporary	RDL 2/2009.

Table A.I

List of Legislated Tax Changes (Continued)

Type	Announcement	First Impact	Description (in Spanish)	Exogeneity	Cumulative Impact	Perm/Temp	Source
CIT	23-Dec-08	2009q3	Libertad de amortización para adquisiciones en 2009 y 2010 con mantenimiento del empleo. Se extiende (sin condición de empleo) en diciembre 2011 y se elimina en 2012	Endogeneous	-0.01	Permanent	Ley 4/2008. RDL 13/2010. RDL 12/2012.
ED	12-Jun-09	2009q3	Incremento de los tipos (desde 13 junio) hidrocarburos	Consolidation	0.09	Permanent	RDL 8/2009.
PIT	30-Sep-09	2010q1	Suprime parcialmente la deducción (implantada en 2008) de 400 para perceptores de rentas del trabajo	Endogeneous	0.49	Permanent	Ley 26/2009.
VAT	26-Sep-09	2010q3	Incrementos tipos desde 1 julio 2010: 16,0% al 18,0% y 7,0% al 8,0%	Consolidation	0.63	Permanent	Ley 26/2009.
PIT	30-Sep-10	2011q1	Suprime las devoluciones anticipadas (implantado en 2007) del Plan CUNA	Consolidation	0.09	Permanent	Ley 39/2010.
CIT	19-Aug-11	2011q4	Desde el 20/08 se eleva el porcentaje de cálculo de los pagos fraccionados (para los aos 2011 a 2013) para empresas que facturan más de 20 mill. y 60 mill.: se pasa a permanente	Endogeneous	0.00	Temporary	RDL 9/2011.
VAT	19-Aug-11	2011q4	Se rebaja el tipo impositivo del 8% al 4% a las entregas de viviendas realizadas entre el 20 de agosto y el 31 de diciembre 2012. Se prorroga al 2013	Endogeneous	0.00	Temporary	RDL 9/2011. RDL 20/2011.
O	16-Sep-11	2012q1	Restablece el Impuesto sobre Patrimonio	Consolidation	0.12	Permanent	RDL 13/2011. Ley 22/2013.
PIT	30-Dec-11	2012q1	En 2012 y 2013 (pasa a permanente) se introduce gravamen complementario entre 0,75 y 7,00 puntos en función del tramo de la base liquidable y la retención sobre el capital al 21%	Consolidation	0.46	Permanent	RDL 20/2011.
CIT	30-Mar-12	2012q2	Limita la deducción de los gastos financieros de créditos con entidades del grupo. Se extiende en julio la limitación para todas las sociedades	Consolidation	0.11	Permanent	RDL 12/2012. RDL 20/2012.
CIT	30-Mar-12	2012q2	Se establece (2012 y 2013) un pago fraccionado mínimo (8% del resultado contable positivo) para empresas que facturen más de 20 mill. : pasa a permanente	Consolidation	0.00	Temporary	RDL 12/2012. RDL 20/2012.
VAT	13-Apr-12	2012q3	Incrementos tipos desde 1 septiembre 2012: 18,0% al 21,0% y 8,0% al 10,0%	Endogeneous	0.94	Permanent	RDL 20/2012.
CIT	13-Jul-12	2012q4	Incrementa los tipos impositivos para las entidades con facturación mayor a 10, 20 y 60 mill.: pasan del 21%, 24% y 27%, respectivamente, al 23%, 26% y 29%	Endogeneous	0.00	Temporary	RDL 20/2012.
PIT	13-Jul-12	2012q4	En 2012 y 2013 se elevan del 15% al 21% las retenciones de actividades profesionales y rend. del trabajo derivados de la impartición de cursos conferencias, etc	Endogeneous	-0.08	Temporary	RDL 20/2012.

Table A.I

List of Legislated Tax Changes (Continued)

Type	Announcement	First Impact	Description (in Spanish)	Exogeneity	Cumulative Impact	Perm/Temp	Source
CIT	13-Jul-12	2012q4	En 2012 y 2013 (pasa a permanente) se aumenta la limitación a la compensación de bases imponibles negativas y por inmovilizado intangible	Endogeneous	0.00	Temporary	RDL 20/2012.
CIT	13-Jul-12	2012q4	En 2012 y 2013 (pasa a permanente) aumenta la base imponible con el 25% del importe de dividendos y rentas a los que resulte de aplicación la exención por doble imposición	Endogeneous	0.00	Temporary	RDL 20/2012.
SIC	01-Jul-12	2013q1	Aumento de las bases máximas de cotización en un 5,0%	Consolidation	0.08	Permanent	Ley 17/2012.
O	30-Sep-12	2013q1	Creación impuestos sobre producción energía eléctrica, combustible nuclerar y almacenamiento rediduos radioactivos	Consolidation	0.19	Permanent	Ley 15/2012.
CIT	27-Dec-12	2013q2	Para 2013 y 2014 (pasa a permanente) se limita al 70% del máximo previsto en tablas la deducción de las amortizaciones del inmovilizado material para grandes empresas	Consolidation	-0.08	Permanent	Ley 16/2012.
SIC	30-Sep-13	2014q1	Aumento de las bases máximas de cotización en un 5,0%	Consolidation	0.08	Permanent	Ley 22/2013.
SIC	20-Dec-13	2014q1	Pagos en especie y autónomos	Long-run	0.10	Permanent	RDL 16/2013.
PIT	23-Jun-14	2015q1	Rebaja los tipos en dos aos (2015 y 2016). También modifica deducciones	Long-run	-0.36	Permanent	Ley 26/2014.
CIT	23-Jun-14	2015q1	Rabaja tipos del 30% al 28% y 25% en dos aos y amplía bases	Long-run	-0.11	Permanent	Ley 27/2014.
PIT	10-Jul-15	2015q3	Adelanta la segunda parte de la reforma de 2016 a julio de 2015	Long-run	-0.14	Permanent	RDL 9/2015.

Notes: This table shows the narrative dataset of legislated tax changes of the period 1986-2015. The type of tax changes are: value added tax (VAT), personal income tax (PIT), corporate income tax (CIT), social insurance contributions (SIC), excise duties (ED) and other (O). First impact is the quarter where the tax change triggered the first change in liabilities/payments with respect to the previous year. The announcement date corresponds generally to the date the tax change becomes law. Endogenous measures are those taken to offset macroeconomic shocks likely to affect output in the near term. The exogenous categories are as follows: long-run are tax changes aimed at increasing long-run growth; external changes are those imposed external bodies; and consolidation measures are those enacted to improve the budget balance independently of the macroeconomic situation. Note also that we exclude from the estimation of the baseline impulse-response functions those tax changes adopted during the period 2008-2013, i.e. those between RDL 2/2008 and RDL 16/2013. The cumulative impact is the yearly cumulative impact in percentage of GDP.

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