



A new carbon tax in Portugal: A missed opportunity to achieve the triple dividend?



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HIGHLIGHTS

- In a general-equilibrium model, we simulate the effects of a carbon tax in Portugal.
- A carbon tax is needed for Portugal to meet its 2030 target in emissions reductions.
- In the long run, it's possible to design a carbon tax to achieve the triple dividend.
- The Portuguese parliament ultimately approved an unsatisfactory carbon-tax package.
- Carbon-tax revenues must be recycled into lower taxes and promote energy efficiency.

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ABSTRACT

In 2014, the Portuguese government appointed a Commission for Environmental Tax Reform that formulated a carbon-tax proposal designed to achieve three dividends: to help Portugal meet the European Union's target for emissions reductions by 2030, to boost long-term employment and GDP above their pre-carbon-tax levels, and to strengthen public finances by lowering public indebtedness. A key feature of this proposal was a judicious set of mixed strategies to recycle all carbon-tax revenues back into the economy. In this note, we show how the carbon tax that the Portuguese Parliament eventually approved deviated from such guidelines, and ultimately failed to achieve the triple dividend. We argue that authorities need to quickly amend the existing legislation to avoid this misguided attempt turning into a missed opportunity to improve environmental, macroeconomic, and fiscal outcomes.

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1. Introduction

Portugal has pledged to cut its carbon-dioxide emissions by 2030 by 40% in relation to 1990 levels (European Commission, 2014c). Reaching this target, on time, will require a public policy that lowers the carbon intensity of the Portuguese economy, well beyond what will be achieved with the ongoing trends both in the price of fossil fuels and in domestic energy-efficiency gains.

There is a growing consensus among policy-makers – that has long been accepted among economists – that putting a price on GHG pollution is the most effective means of reducing our carbon footprint (see, for example, Stern, 2007; Krupnick et al., 2010; OECD, 2011; Aldy and Stavins, 2012; Mankiw, 2013; IMF, 2014; Parry et al., 2014). Indeed, carbon taxes are preferred to top-down regulations for three reasons: by 'internalizing the externality' in a less-invasive way, they encompass all possible margins of adjustment in the fight against global warming (Mankiw, 2013), they spur innovation in energy efficiency beyond the regulated targets, by diverting demand to cleaner renewable alternatives (Stern, 2007; World Bank, 2014), and, importantly, they provide revenues that can be recycled back into the economy and into the environment (Jorgenson, 2014).

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This ‘tax and dividend’ approach, whereby pollution is taxed away and the proceeds are allocated to lowering taxes aimed at spurring economic growth, thereby improving public finances, is at the heart of what is known in the literature as the second and the third dividends (see, for example, [Goulder, 1995](#); [Nordhaus, 2010](#); [Metcalfe, 2010](#); [Pereira and Pereira, 2014a](#)). The first dividend is of an environmental nature, and is naturally connected with the reduction in carbon-dioxide emissions. The second dividend is related to macroeconomic performance, specifically if the levels of employment and of GDP are higher with the carbon tax. The third and final dividend is connected with the budgetary position, and materializes with a lower ratio of public debt to GDP.

A double dividend involves simultaneously obtaining environmental and economic gains as a result of a tax on carbon (see, for example, [Bovenberg, 1999](#); [Ligthart, 1998](#)). Although a tax on carbon has a direct negative effect on GDP, the cost of significantly reducing pollution can be driven to zero, even without taking into account the resulting environmental benefits ([Goulder, 1995](#)). For that to happen, policymakers need to lower marginal tax rates at other distortionary margins so as to improve efficiency. By shifting the tax burden from physical and human capital to carbon emissions, the burden of the whole tax system is reduced, households benefit from higher incomes, and the economy’s aggregate performance improves. Indeed, one of the main distortionary effects of taxation is lower levels of employment, as personal-income taxes, value-added and excise taxes, as well as social security contributions all reduce a worker’s consumption wage ([OECD, 2004](#)). Nevertheless, [Jorgenson et al. \(2013\)](#) caution that such gains are not a foregone conclusion, and that policymakers need to make informed judgments, in particular regarding what to do with the carbon-tax revenues. In fact, if these are distributed lump sum back to households, then no double dividend takes place.

Since the beginning of this century, Portugal has witnessed disappointing economic growth, to the extent that it has consistently fallen behind in terms of real convergence to its EU peers. In fact, during the 2000s, the Portuguese economy grew at an annual average of 0.7%, or about half of the rate for the EU-28 (see [European Commission, 2015a](#)). Similarly, Portugal has been plagued by a structurally-weak budgetary position. In the wake of the global financial crisis of 2008, Portugal lost access to international bond markets in mid-2011, and only recently has Portugal exited a strict EU-ECB-IMF adjustment program. Indeed, between the end of 2008 and the end of 2011, reflecting the effects of the financial crisis, the public-debt-to-GDP ratio rose by nearly 40% points to 111.1%. Since then, despite a tight fiscal policy, it reached 130.2% by the end of 2014 (again, see [European Commission, 2015a](#)).

In such a context of historically-high levels of public indebtedness, where fiscal space is now meagre and the economic recovery is still nascent, Portugal needs to realize the triple dividend. In addition to reducing carbon emissions and restoring economic growth through higher levels of employment, fiscal consolidation tops the policy agenda. As such, great care is needed in terms of the specific design of a carbon tax. It is definitely not enough for Portugal just to reach the 40% target reduction for carbon-dioxide emissions by 2030, if doing so entails even weaker macroeconomic and fiscal outcomes in the future.

In September of 2014, a Commission for Environmental Tax Reform (*Comissão para a Reforma da Fiscalidade Verde*, CRFV, hereafter), appointed by the Portuguese government earlier in the year, submitted a report containing a proposal for a package that was designed to guide Portugal to a triple dividend in the long run (see [CRFV, 2014](#)). Then, in November 2014, upon government proposal, the Parliament approved a new carbon tax, to take effect on January 1st 2015, which ignored many of the key characteristics proposed by the CRFV Commission.

The objective of this note is to present simulation results on how far is what was approved by the Portuguese parliament from

what was proposed by the CRFV Commission. We show that a carbon tax in Portugal is needed, and it can be virtuous in the long run, that is, it can yield the second and the third dividends, but only if it is done right. Furthermore, we present evidence that what was approved by parliament falls short of these objectives. In fact, authorities proved to be unwilling to commit to earmarking carbon-tax revenues towards the most efficient recycling alternatives, or to any energy-efficiency objectives, for that matter, or even to simply recycle the carbon tax revenues after 2015. The economic and budgetary consequences are clear: as approved, the new carbon tax will ultimately fail to deliver on the second and the third dividends.

The simulation results on the environmental, macroeconomic, and budgetary effects of a new carbon tax were obtained with a dynamic general-equilibrium model of the Portuguese economy. This model incorporates fully-dynamic optimization behavior, and features an endogenous-growth mechanism, as well as a detailed modeling of the public-sector account, both in terms of spending and in terms of taxes and contributions. It is worth highlighting that all major tax bases are fully endogenous, a feature that is crucial to seriously evaluate any tax reform package.

Previous versions of this model were used to evaluate the impact of alternative tax policies (see [Pereira and Rodrigues, 2002; 2004](#)), public pension reform (see [Pereira and Rodrigues, 2015](#)), and other energy and climate policies (see [Pereira and Pereira, 2013; 2014a; 2014b](#)). Even more crucial from this note’s perspective, this model served as the basis for the Commission’s recommendations, and all results presented here are, although naturally in a different context, included in its official report (see [CRFV, 2014](#)). Accordingly, the key contribution of this article is to provide answers to a well-defined policy question in a well-defined public policy situation, answers which were instrumental in the actual framing of the proposals by the CRFV Commission and the carbon tax, as it was eventually adopted. From a conceptual standpoint it connects the introduction of a carbon tax to its economic and budgetary effects, something that makes its interest much more than parochial, as many economies struggle with the dual woes of low growth and high public indebtedness.

The remainder of this note is structured as follows. [Section 2](#) describes the dynamic general-equilibrium model used. [Section 3](#) summarizes and discusses the significance of the simulation results. [Section 4](#) concludes with policy recommendations.

2. Methods and data

To determine the long-term environmental, economic, and budgetary effects of a carbon tax in Portugal, we use a dynamic general-equilibrium model that features an energy sector, endogenous growth, and a detailed public sector. [Pereira and Pereira \(2012, revised in 2014\)](#) provide a full account of the model’s equations, parameters, data, calibration, and numerical implementation. What follows is, necessarily, only a very general description.

2.1. A general description of the model

In a decentralized economy framed in real terms, all agents are price takers with perfect foresight. The production sector, the household sector and the public sector are fully endogenous, while the foreign sector is not. Capital is not fully mobile as the accumulations of the different types of capital are subject to investment-specific adjustment costs.

The economy’s trajectory is given by the optimal evolution of eight stock and five shadow-price variables – private capital, wind-energy capital, public capital, human capital, and public debt, and

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