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Unemployment and debt dynamics in a highly indebted small open economy

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The paper analyzes the dynamic effects of a total factor productivity shock and an interest rate risk premium shock in a highly indebted open economy. In contrast to the standard open economy framework, search unemployment and wage bargaining are introduced. We find that a negative total factor productivity shock primarily has effects on the economy's production side and on welfare, but not on its stock of foreign debt and the country specific risk premium, and large part of the adjustment happens in the short-run. In contrast, a pure increase in the country specific risk premium causes substantial dynamics and a considerable reduction in foreign debt, allowing higher consumption in the long run and creating an intertemporal welfare gain, even though unemployment increases strongly in the short-run. A 50% haircut of foreign debt significantly reduces the initial response of the unemployment rate. In case of a temporary productivity shock, sticky wages imply smaller employment, but generate higher welfare than flexible wages.

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1. Introduction

The 2007–2009 global financial crisis has provoked a severe contraction of economic activity as credit supply fell (“credit crunch”) and international trade declined. Peaking in September 2008, the ability of the financial system to allocate loanable funds has been persistently constrained and total factor productivity (TFP) has fallen (see IMF (2009, ch. 4)). Several recent studies provide support for

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this view (see, e.g., Estevão and Severo (2010), Haugh et al. (2009), Meza and Quintin (2005), and Cole et al. (2005)).¹

On the international financial market, countries which already had a high foreign debt to GDP ratio and disadvantageous macroeconomic prospects in terms of growth, unemployment, or structural labor market weaknesses, were charged with high risk premia. e.g., the interest rate spread between Greece and Germany was raised from close to zero in 2006 to roughly 4 percentage points in January 2010. Many of these highly indebted countries also suffer from persistent and higher unemployment. In the troubled countries of the Euro-zone – Portugal, Ireland, Greece, and Spain – the harmonized OECD unemployment rates increased from 8.1% to 11.1%, 4.6%–13.7%, 8.3%–12.9%, and 8.3%–20.5% between 2007 and the third quarter of 2010, respectively. In consideration of these observations, the focus of this paper is the explanation of the unemployment dynamics in highly indebted open economies in the aftermath of negative TFP shocks and increases in the interest rate risk premium.

In order to understand the behavior of unemployment in these countries, we need to study the flows in and out of employment. In this vein, Rogerson and Shimer (2010) decompose the fluctuations in total hours worked into changes in employment and changes in hours worked per worker for a large set of OECD countries. They find that “movements in and out of the labor force are relatively unimportant at business cycle frequencies in the United States”. While the empirical evidence for European countries is mixed, these authors show that this effect is even less relevant for Ireland and, in particular, the Southern European countries like Greece, Spain, and Portugal that we have in mind for this study (compare Fig. 3 in Rogerson and Shimer (2010)). From this observation, they conclude that “changes in unemployment over the business cycle capture a great deal of the change in total hours worked over the business cycle, and so to a first approximation, understanding cyclical fluctuations in total hours amounts to understanding the movement of workers between employment and unemployment”. We consider the search model of Pissarides (2000) as a convenient framework to analyze these flows.

In order to analyze the dynamics of unemployment, we therefore augment and modify the standard representative agent model of a one-sector, two-good open economy (see, e.g., Turnovsky (2000, ch. 11)) by introducing search unemployment à la Mortensen and Pissarides² and wage bargaining in a similar way as in the closed economy models of Shi and Wen (1997, 1999) and Heer (2003). Unemployment results from time-consuming and costly matching of vacancies with agents who search for a job. In addition, we also discuss the effects of sticky wages on unemployment dynamics and welfare.

Our model follows Schubert (2011) and differs from Shi (2001) and the closed economy versions of Shi and Wen (1997, 1999) and Heer (2003) in several important aspects. First, the representative agent's utility function is assumed to be non-separable with respect to consumption and leisure, allowing for richer consumption dynamics. Second, we introduce investment adjustment costs, giving rise to a Tobin q theory of investment. This enriches the dynamics and allows us to investigate the time profile of stock prices (the price of capital). Third, we depart from the assumption that the production function is Cobb-Douglas and use the more general constant elasticity of substitution (CES) specification. Fourth, we endogenize the interest rate by imposing a country specific risk premium which depends on the country's ability to service its foreign debt, proxied by the debt-GDP ratio. Fifth, we introduce sticky wages into the model.

We find that a pure total factor productivity shock has a modest short-run effect on unemployment and leads to a decumulation of capital and debt. The debt dynamics, albeit small in magnitude, induce a capital flow reversal. The welfare loss of the shock is considerable. In contrast, a pure interest risk premium shock leads to a large increase in unemployment. The capital stock, output, and labor evolve in a non-monotonic way, and during transition the economy drastically reduces its debt. The overall welfare effect of an increase in the risk premium is positive. This implies that from a long-run point of view, the increase in a country's risk premium is welfare improving. If the two shocks occur together, the responses of capital, output, unemployment, and the interest rate reinforce themselves, whereas the consumption adjustment is dampened, and the welfare loss is reduced. If the shock is combined

¹ As one of the few exceptions, Petrosky-Nadeau (2010) comes to the opposite conclusion that TFP increased after the 2008 financial crisis.

² See Pissarides (2000) for an overview.

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