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## Labor market frictions and the international propagation mechanism

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## ABSTRACT

The paper studies the role of labor market frictions in accounting for international business cycle comovement. To this aim, we embed labor market search and matching frictions in a two-country New Keynesian model. We show that labor market frictions amplify the international propagation of supply and demand shocks. In terms of cyclical properties then, they raise the cross-country output correlation. Adding labor market search in the New Keynesian model thus improves its ability to account for the business cycle comovement observed in G7 countries in the recent decades. Nominal wage rigidity substantially contributes to this result. Labor market institutions also play a role. Yet, their impact is not unequivocal depending on the institution considered. Business cycle synchronization is thus found to increase with the generosity of the unemployment benefits system, whereas it decreases with the strictness of employment protection.

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## 1. Introduction

There is a longstanding interest in the determinants of international business cycle interdependence, as attested by the central place devoted to understanding the international propagation of shocks in the traditional international macroeconomics textbooks. The topic has been substantially renewed in the last decades with the emergence of the international Real Business Cycle (RBC) literature (Backus et al., 1995). Two limits of this literature may be underlined though. First, international RBC models that typically assume flexible prices in a pure walrasian setting fail to account for some key dimensions of international stylized facts. In particular, the predicted cross-country GDP correlation is too low as compared to the data. Hairault (2002) shows the improving role of introducing labor market search and matching frictions à la Pissarides (1990) in the international RBC model, as it helps to better account for the propagation of international fluctuations arising from productivity shocks. Second, the international RBC literature (and Hairault (2002) among them) faces inability to account for the international transmission of demand shocks, inherently due to its “real” nature. In this respect, Kollmann (2001) departs from the Real Business Cycle paradigm by developing a two-country New Keynesian model featured by monopolistic competition and nominal rigidities. Within this framework, he shows the importance of nominal rigidities in the international transmission of monetary and supply shocks.

Building upon these contributions, our objective is to assess the role of labor market frictions in accounting for international business cycle synchronization. To this aim, we embed labor market search frictions in a two-country New Keynesian model featured by monopolistic competition and nominal rigidity on the goods market. Unlike Hairault (2002), adopting the New Keynesian framework enables us to tackle the question of the international propagation of demand shocks. Our work

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differentiates from Kollmann (2001) by the labor market modeling. By assuming that the whole workforce is necessarily employed, Kollmann (2001) fully assimilates aggregate hours to individual worked hours. Yet, a large number of papers recently points out the importance of differentiating adjustments in aggregate hours between those occurring at the intensive margin (worked hours per employee) and at the extensive margin (the number of employees). In a closed-economy set-up, Trigari (2004), Christoffel and Küster (2008) or Krause and Lubik (2007) (among others) examine the link between monetary policy shocks, employment and output dynamics in a labor market search environment.<sup>1</sup> From an open-economy perspective, Langot and Quintero-Rojas (2009) point out that the cross-country differences in aggregate hours are mainly driven by those occurring between employment levels since the beginning of the 1980s. In an international RBC framework, Hairault (2002) demonstrates the importance of labor market adjustments that occur along the extensive margin in explaining international business cycle properties.<sup>2</sup>

This reading of the literature motivates our investigation of the role of labor market search frictions in the international propagation of supply and demand shocks and the extent of international comovement. To convincingly evaluate their role on the topic, we adopt the following strategy. As pointed out by Kollmann (2001), the ingredients of the New Keynesian framework (monopolistic competition and nominal rigidities) are key elements in the international transmission of real and nominal shocks. This framework therefore constitutes the “natural” benchmark into which we embed labor market search and matching frictions. We then carefully compare the predictions of the New Keynesian model with and without labor market search.<sup>3</sup> This strategy allows us to evaluate the role of labor market frictions in enhancing the international propagation of supply and demand shocks, relative to the vector of international transmission provided by nominal price rigidity. On this aspect, Kollmann (2001) points out that both sticky prices and wages are important elements in accounting for GDP comovement. This drives us to also include nominal wage rigidity in the labor market search model, that we model by assuming quadratic adjustment costs on wage changes, similarly as in Arseneau and Chugh (2008). In this setting, we examine the role of labor market frictions in the extent of international comovement. Extending Hairault’s (2002) results, we expect labor market search to amplify the international propagation of monetary as well as productivity shocks. In terms of cyclical properties then, this is likely to favor the magnitude of international business cycle synchronization.

Our results may be summed up in two points. First, we show that labor market frictions increase the extent of international business cycle comovement in the occurrence of either productivity or demand shocks. Cross-country correlation of employment, aggregate hours, investment and output are stronger when labor market frictions are embodied in the New Keynesian model. Adding labor market search thus improves the ability of the New Keynesian model to account for cross-country business cycle comovement observed among the G7 countries over the recent decades. Second, we show that nominal and real labor market rigidities matter in this result. The larger the degree of wage stickiness, the stronger the extent of GDP comovement. This result stands in accordance with Kollmann’s (2001) findings. Complementing his conclusions, we show that this result is channeled through both the extensive and the intensive margins of labor input. Wage stickiness indeed raises the cross-country comovement of the employment levels, not only that of individual worked hours. Real labor market rigidities, as captured by labor market regulations, also matter in the magnitude of international comovement. Interestingly, their impact is not unequivocal depending on the type of labor market regulations considered. We thus find that international business cycle synchronization increases with more generous unemployment benefits, while it decreases with the strictness of employment protection. An empirical exercise confirms that these predictions are supported by the data in OECD countries.

The paper proceed as follows. Section 2 presents the building blocks of model. Section 3 studies the role of labor market frictions in international comovement by presenting the model’s cyclical properties. To better account for the simulation results, we provide IRFs analysis to put emphasis on their role in the international transmission of productivity and monetary policy shocks. In Section 3.4, we evaluate how the degree of nominal wage rigidity on the one hand, and the design of labor market institutions on the other hand, affect the magnitude of international interdependence. Section 4 concludes.

## 2. A two-country model with labor market search

### 2.1. Description of the model

We build a two-country New Keynesian model, that features monopolistic competition and sticky prices on the goods market and search and matching frictions on the labor market. Before developing further, let us motivate our modeling choices on this aspect.

We retain an efficient Nash-bargaining process, as both hours and wages are periodically subject to negotiations between firms and workers. If some recent contributions rather advocate in favor of a right-to-manage setting, where only the wage

<sup>1</sup> This is only a selected list of papers, that does not exhaust the large bunch of related works on the topic.

<sup>2</sup> Our work is also related to Campolmi and Faia (2006) and Fonseca et al. (2009). In a two-country New Keynesian framework, Campolmi and Faia (2006) examine the role of cross-country heterogeneity in labor market institutions in the transmission of monetary policy shocks in countries within a monetary union. In an international RBC model, Fonseca et al. (2009) study the role of cross-country heterogeneity in labor market institutions in the international propagation of productivity shocks. In contrast to these papers, we discard the question of labor market heterogeneity, to study the role of labor market search frictions in the international propagational shocks among symmetric countries in a flexible exchange rate regime.

<sup>3</sup> In this case, the model features a walrasian labor market functioning, as detailed in Appendix A.

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