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Review of Economic Dynamics

Trade agreements and international comovements: The case of NAFTA (North American Free Trade Agreement) ☆

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A B S T R A C T

Business cycles correlation between Mexico and the US changed from being on a downward sloping path before 1992 to an upward sloping path after that. This paper suggests that the North American Free Trade Agreement could be the explanation. NAFTA generated not only an increase in the volume of trade but also a change in the elasticity of substitution between imports and exports. The paper tests this hypothesis using the neoclassical business cycles model. Although there are still some discrepancies between the theory and data in the degree of correlation, the direction of change in the model corresponds to the one in the data.

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1. Introduction

In this paper I focus on three things. First, I present empirical evidence that the correlations between the business cycles fluctuations of Mexico and the US had a sudden change in 1992: they have been on a downward sloping path until 1992, then they started to increase. Second, I interpret this change as an anticipated effect of the North American Free Trade Agreement and I search for the channels through which the trade agreement could affect comovements. Third, I test the proposed explanation using the neoclassical business cycles model.

The fast evolution of world globalization generated an increasing interest of the economic literature for studying the effects of this process on the main macroeconomic variables. In particular, a large branch of literature studies the correlation between trade intensity and GDP comovements of the countries involved. On the one hand, there are many studies in the literature which show that, in cross-sectional analysis, more trade is associated to more correlated GDP business cycles of the countries involved (see Frankel and Rose, 1998; Anderson et al., 1999; Imbs, 2004; Kose and Yi, 2006). Most of these studies are done for industrialized countries, including, in particular, the US economy. On the other hand, Heathcote and Perri (2003), taking into account the time dimension, showed that US became less correlated with the rest of the word

despite the fact that it become more open to trade. In the same line, Burstein et al. (2008) claim that "bilateral correlations are sensitive to the time interval over which they are calculated as well as to the country pairing".

Moreover, Calderon et al. (2007) studied the differences between developed and developing countries in their relationship between trade intensification and business cycles synchronization. The conclusion of their paper is that "while trade intensity increases cycle correlation among industrial countries, there are reasons to believe that this could be different among developing countries and among industrial-developing countries". In particular, when they ran a panel-data analysis, they found that the estimated trade intensity does not have any significant effect on the cycle synchronization for the mixed pairs of countries (industrial-developing countries). Mexico–US belongs to this last category. This raised the important question about what happened with the business cycles in Mexico and US as a result of signing NAFTA.

Trade flows between Mexico and the US have been on an increasing path since 1980. In the light of the cross-country results existing in the literature (more trade implies more correlated business cycles[1]), one would expect a continuously improving synchronization between Mexico and the US business cycles since 1980. Instead, what one could observe in the data is a decreasing tendency in the business cycles correlation until 1992 followed by an increasing one after 1992. In other words, a U-shape, with a sudden change around the year 1992, when the preparatives for signing NAFTA finished. This is the main reason why this paper focuses on that particular period.

To get an insight into the potential reasons for this change, I take a closer look at some documented facts in the literature. On the one hand, Burstein et al. (2008) showed that the composition of trade is at least as important as the volume of trade in accounting for the observed cross-country correlations of output. Moreover, Kehoe and Ruhl (2003) showed that one of the most important effects of NAFTA on the US–Mexico trade was a change in the composition of tradable goods. On the other hand, it is a well-documented fact that the elasticity of substitution between imports and exports is a central piece in the international business cycle model (Zimmermann, 1994; Kose and Yi, 2006; Chaney, 2008; Burstein et al., 2008). This motivates the second question of my paper: what happened with the elasticity of substitution between imports and exports in the case if Mexico–US? I present here some evidence that this elasticity decreased after NAFTA.

The last part of this paper questions the capacity of the model to reproduce the pattern of the correlation between Mexico and US. Using the now classical international business cycle model a la Backus et al. (1995), I endogenize the elasticity of substitution and I introduced trade costs that decrease when NAFTA is signed. The results of the simulations show that a decrease in the elasticity of substitution, together with an increase in the volume of trade are able to reproduce the U-shape observed in the data. Nevertheless the model fails to simulate the comovement levels observed in the data. A sensitivity analysis shows that a change in the structures of the TFP processes might help improve the results.

The paper is organized as follows: I start by presenting the empirical evidence in Section 2, followed by a short survey of the insights provided by the literature in Section 3. Sections 4 and 5 present the model and its calibration, and Section 6 explains the results. Finally, Section 7 concludes and presents lines for future research.

2. Empirical evidence

The objective of this section is to analyze the evolution in time of the comovements of consumption, investment and output for the case of the US and Mexico. Our main focus is on the patterns of the correlations around the years 1992–1994 when preparatives for signing North American Free Trade Agreement (NAFTA) finished and the agreement came into force.

Although NAFTA was signed by the US, Mexico and Canada, I present here only the empirical evidence for the case of the US and Mexico. I made this choice for two reasons. First, since the US and Canada have had an intense trade-relationship even before 1994 (for example, the Canadian Free Trade Agreement signed between Canada and the US came into force in 1989) one would not expect a strong impact of NAFTA on their macroeconomic paths. Second, the case of Mexico–Canada is not so interesting because the volume of trade between Canada and Mexico is only 4 percent of the existing trade between the US and Mexico.

Trade flows between Mexico and the US have been on an increasing path since 1980 (see Fig. 1). In the light of the results existing in the literature (more trade flows are associated to more correlated business cycles of the countries involved), one would expect a continuously increasing tendency in the comovements US–MEX since 1980.

In the following I present the empirical evidence concerning the correlation in the business cycle fluctuations of consumption, investment and output. For this I run two experiments: the first one consists in comparing the correlations in business cycle fluctuations before and after signing NAFTA. Since this experiment is not enough to conclude that there is any impact of NAFTA, I run the second experiment which consists in computing the correlations from a moving-5-years window and plotting them versus time. This gives a better idea about the evolution in time of the comovements US–Mexico and one can see if there is any clear change in tendency around 1994, the year when NAFTA came into force.

For the first experiment, I use the Hodrick–Prescott detrended series for consumption, investment and output in Mexico and the US. In order to compare the comovements before and after signing NAFTA, I split the series in two equal periods of time, before and after 1994.[2] Table 1 displays the pre- and post-NAFTA cross-country correlations of consumption,

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[1] Kose et al. (2003).

[2] See Appendix A for a detailed description of the data.