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Macroeconomic Effects of International Trade

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Abstract

International trade can affect the macroeconomy by helping to transmit disturbances from one economy to another and by muting or amplifying the impact of fiscal and monetary policies on economic activity. Representative open economy macro models are discussed, highlighting the role different theoretical features play in influencing the channels through which trade flows can have macro effects.

Keywords

Balassa–Samuelson effect; Beggar-thyneighbour; Capital mobility; Comparative advantage; Consumption correlations puzzle; Contagion; Currency unions; Elasticities approach to the balance of payments; Elasticity of substitution; Endogenous growth models; Exchange rate puzzles; Exchange rate regimes; Externalities; Feldstein–Horioka puzzle; Flexible exchange rates; General equilibrium; Imperfect competition; Income-expenditure models; Income multiplier; Inflation; International real business cycles; International trade; Keynesian model; Macroeconomic effects of international trade: Marshall-Lerner-condition; Robinson Microfoundations: Monopolistic competition; Mundell-Fleming model; National income; New openeconomy macroeconomics; Production sharing; Purchasing power parity; Research and develop-Specialization; ment; Spillovers; Technological progress; Terms of trade; Trade costs; Trade frictions

JEL Classifications F4

The field of open economy macroeconomics deals with the macroeconomic behaviour of economies that trade with each other. International trade can have macroeconomic effects by helping the transmission of disturbances from one economy to another as well as by affecting the impact of macroeconomic policies on economic activity. This article discusses several representative open economy macro models, highlighting the role different theoretical features play in influencing the channels through which trade flows can have macro effects.

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Keynesian Framework

At its simplest level, international trade is linked to macroeconomic activity through the national income relation. Consider the Keynesian income-expenditure model of a small open economy, in which prices and the interest rate are given, foreign demand for exports is exogenous, and domestic output is determined by demand. With these assumptions, an exogenous increase in domestic expenditures raises domestic income and worsens the current account balance; however, income rises less than in a closed economy because of leakages from the income stream through imports and through saving. In contrast, an exogenous increase in foreign demand for domestic goods leads to an increase in both exports and domestic income. Because the increased direct demand for exports is only partially offset by the expansion of imports induced by higher income, the current account improves overall. The resulting rise in domestic output implies positive cross-country transmission of the foreign disturbance.

Income multiplier effects through changes in trade also characterize open economy extensions of the Keynesian framework, such as the classic Mundell-Fleming model. This model also takes prices as given, but allows the income effects of monetary stimulus and exogenous expenditure changes to take account of interest rate changes depending on the degree of international capital mobility and of exchange rate changes, which in turn depend on the exchange rate regime. With a flexible exchange rate regime, exchange rate changes affect the relative demand for domestic and foreign goods. Thus, for example, domestic monetary stimulus that reduces the interest rate, raises income, and creates an excess demand for foreign exchange also depreciates the domestic currency. If the Marshall-Lerner-Robinson condition is satisfied, that is, the sum of price elasticities of domestic and foreign demands for imports exceeds unity, then the lower relative price of domestic goods switches demand from foreign to domestic goods and raises the current account balance, causing domestic income to increase and foreign income to decrease. Accordingly, the

domestic income multiplier effect of the monetary stimulus is augmented by the expenditureswitching effect of the exchange rate; in addition, the trade transmission effect of domestic monetary shocks to foreign income is negative.

In these models crucial parameters affecting transmission effects include the marginal propensity to import and the elasticity of trade with respect to the exchange rate. Thus, for example, an increase in the marginal propensity to import out of income lessens the multiplier effects of domestic policy stimulus.

New Open Economy Macro Models

New open-economy macroeconomic models (NOEM) integrate older fixed-price Keynesian models of macroeconomic fluctuations with dynamic intertemporal analysis based on microeconomic foundations and optimizing agents. These models embed imperfect competition and short-run nominal rigidities in a general equilibrium framework and provide clear welfare criteria in the form of the utility of the representative consumer. They also assume that bond (but not equity) markets are integrated, providing a consumption-smoothing role for net trade flows via the current account. Thus, for example, a temporary productivity shock that raises domestic output induces higher saving and a temporary current account surplus (though with investment dynamics a current account deficit may result if the increase in investment exceeds the increase in saving).

In a seminal paper, Obstfeld and Rogoff (1995) use a two-country framework in which each country specializes in producing a subset of tradable goods, and domestic and foreign consumers have identical preferences over a basket of both domestic and foreign goods. They show that monetary shocks have a positive effect on domestic output and a negative transmission effect on foreign output, as in the Mundell–Fleming model. Because monetary stimulus depreciates the domestic currency, it lowers the domestic country's terms of trade, reduces the purchasing power of domestic residents and raises the purchasing power of foreign residents. This terms-of-trade effect makes foreign residents better off and domestic residents worse off, but not by enough to offset the domestic gains from greater output. A temporary current account surplus is generated as well via the intertemporal consumption-smoothing channel.

A key parameter in NOEM models is the elasticity of substitution between goods embedded in consumer preferences. Obstfeld and Rogoff assume that the elasticity of substitution between goods produced in the same country is the same as the elasticity of substitution between goods produced in different countries. Several papers show how the international transmission of shocks is affected by relaxing this assumption. Tille (2001) shows that, if the elasticity of substitution of domestic and foreign goods exceeds unity, the Marshall-Lerner-Robinson condition holds. In this case, a currency depreciation and decline in the terms of trade results in a large demand switch towards domestic goods and a rise in export revenue. Tille also shows that, if there is less substitutability between domestic and foreign goods across countries than within countries (the empirically more relevant case), the terms-oftrade effect of domestic monetary expansion may be large enough to lower domestic welfare (termed a 'beggar-thyself' effect), while raising foreign welfare. In contrast, greater fiscal expenditures on domestic output raise the domestic terms of trade and domestic welfare, while reducing relative demand for foreign goods and foreign welfare (a 'beggar-thy-neighbour' effect), particularly when domestic and foreign goods are poor substitutes.

Corsetti and Pesenti (2001) deal with the special case in which the elasticity of substitution between domestic and foreign goods is unity, implying constant expenditure shares on domestic and foreign goods. This specification implies that the current account is always in balance. The reason is that, with unit elasticity between domestic and foreign goods, an increase in the foreign price of foreign goods results in a proportionate decrease in the quantity of foreign demand for domestic goods, leaving expenditures on exports constant and the current account unaffected. Other extensions to NOEM models that affect the transmission of policy include consumption bias for domestic over foreign goods (Warnock 2003), pricing-tomarket behaviour (Betts and Devereux 1998), and non-traded distribution services (Burstein et al. 2006).

International Real Business Cycle Models

The tendency of macro aggregates, such as output, to move together in different countries is well documented (Backus et al. 1992; Baxter 1995). Cross-country business cycle correlations depend on the interaction of common international shocks, country-specific shocks, and the transmission of these shocks between countries. An important question in international macroeconomics is how much these comovements reflect the transmission of shocks across borders through international trade linkages. International real business cycle (IRBC) models analyse this issue within a dynamic general equilibrium framework based on microfoundations. Unlike NOEM models, these models typically assume flexible prices and complete markets, though more recent work has introduced price rigidity and incomplete asset markets.

On theoretical grounds, the effect of international trade links on the comovement of national business cycles is ambiguous. On the one hand, greater integration can increase intra-industry specialization and production-sharing because of low elasticity of substitution between intermediate inputs produced in different countries; in addition, it may allow demand shocks to propagate more easily across national borders, which may lead to a higher correlation of business cycles when countries trade more. On the other hand, greater trade integration can increase interindustry specialization if countries specialize more in the goods in which they have a comparative advantage in order to achieve gains from trade; this case, if industryspecific shocks are a dominant source of business cycle movements, may lead to a lower correlation of business cycles when countries trade more.

On balance, the empirical evidence suggests that the former effect dominates, and that

countries with a lot of bilateral trade tend to have more synchronized business cycles (for example, Frankel and Rose 1998; Baxter and Kouparitsas 2005). However, since the early 1980s business cycle synchronization has not in fact increased among industrial countries despite increasing trade integration. Stock and Watson (2005) provide a partial explanation by showing that common international shocks experienced by G-7 countries have been smaller in the 1980s and 1990s than they were in the 1960s and 1970s. But they also show that cyclical comovements have increased for subgroups of countries, notably within Europe and North America. Burstein et al. (2005) construct a model that is consistent with this development in which trade between core countries and their periphery (for example, the United States and Canada) involves more production sharing than does trade between core regions (for example, the United States and Europe). Consequently, one should observe higher output correlations between core and peripheral countries than between core regions. IRBC models have been less successful in explaining the quantitative magnitude of the relation between trade intensity and the cross-country correlation of business cycles; that is, a given change in bilateral trade intensity generates a much smaller change in output correlations than is apparent in the data; this is referred to as the 'trade comovement gap puzzle' (Kose and Yi 2006).

The finding that greater trade intensity is associated with greater cross-country comovements in business cycles suggests that these comovements depend on policies that enhance international trade, such as lowering of trade barriers or reductions in exchange rate costs due to membership in currency unions. Frankel and Rose (2002) find that the positive effect of currency unions on trade in turn has a large effect on output in member countries. Since the main cost of joining a currency area is the cost of giving up monetary independence, this has the implication that a pair of countries with business cycles that are dissimilar ex ante (making the act of joining a currency union appear costly) might have more correlated business cycles ex post because the increase in trade stimulated by the currency union tends to synchronize business cycles.

Trade Frictions and Macro Models

The international tradability of goods depends not just on the degree of substitutability in consumption, but also on transport costs and other trade frictions. In fact, Obstfeld and Rogoff (2000) argue that introducing real trade costs helps explain a variety of puzzles in international economics, including the low crosscountry correlation of consumption (consumption correlations puzzle), the limited magnitude of current account imbalances (Feldstein–Horioka puzzle), international price discrepancies (purchasing power parity puzzle), and home bias in trade and asset holdings.

Taken to the extreme, trade frictions play a role in explaining why some goods may not be traded at all. While open economy macroeconomics by definition analyses trade across national borders, the field has long found it useful to assume that a given exogenous set of goods is non-traded. This traded/non-traded distinction is essential to many well-known results in the field, such as the Balassa–Samuelson effect, which says that, as the productivity of traded goods rises relative to that of non-traded goods, there will be tendency for the real exchange rate to appreciate.

The international trade literature has explained non-tradedness as an outcome of trade frictions. For example, Dornbusch et al. (1977) show how a range of non-traded goods can arise in the presence of cross-country trade costs within a model in which differences in labour productivity across a continuum of goods determine the range of goods a country produces as well as the pattern of trade.

A growing field of international economics research tries to integrate models of trade and macroeconomics and treats the set of tradable goods not as exogenously given but rather as an endogenously determined characteristic of the analysis. Several authors (Ghironi and Melitz 2005; Bergin et al. 2006) formulate open economy macro models with monopolistic competition and heterogeneously productive firms, in which firms face fixed costs of selling in domestic and export markets, to explain phenomena such as the Balassa–Samuelson effect. Since only relatively more productive firms are profitable enough to engage in trade, they endogenously satisfy the precondition of the Balassa–Samuelson story that productivity gains are concentrated in the traded goods sector.

Loose Ends

International trade can influence macroeconomic activity through other channels. For example, as highlighted in endogenous growth models, technological progress may depend on incentives to undertake R&D and innovate, which, in turn, may depend on externalities or spillover effects from greater markets provided by international trade (Grossman and Helpman 1991). Greater openness to trade can also complicate the optimal conduct of monetary policy because of the impact of the exchange rate on real activity and inflation. Clarida et al. (2001) show how more openness to international trade can influence a central bank following an optimal policy feedback rule to raise the domestic interest rate more aggressively in response to inflation pressures. Lastly, trade may serve as a transmission channel through which financial crises may spread contagiously across countries (Glick and Rose 1999).

See Also

- ► Growth and International Trade
- International Real Business Cycles
- ▶ International Trade and Heterogeneous Firms
- International Trade Theory
- Marshall–Lerner Condition
- New Open Economy Macroeconomics
- Trade Costs
- Tradable and Non-tradable Commodities

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