

Chapter 2

International Trade, FDI and Economic Growth: Terms, Interdependencies and Research Focus

In order to conduct a comprehensive study of the impact of international trade and foreign direct investment on economic growth and technological change it is necessary to provide a framework that clarifies the essential terms and explicates the exact research focus. The link between economic integration or globalisation and economic performance of firms and nations is a vast area of research where one finds contributions from many fields of thought – within or outside the science of economics. This chapter therefore gives the essential lines of demarcation which include conceptual definitions as well as the fundamental theoretical orientation of the present contribution.

To delineate the scope of research of the analyses, the distinction between static and dynamic gains from trade has to be clarified first. The difference between the impact on the level of efficiency and the impact on the growth rate of efficiency is crucial for the discussion of the various channels through which trade and FDI may influence technical progress and respectively economic growth. The theoretical approaches that integrate trade and FDI into basic growth models but whose common feature is to predict only medium-run or transitory consequences for the growth process are summarised in order to separate them from the actual research interest of the dissertation. Second, it is expounded that in a world where only few countries are identified as being responsible for moving the technological frontier while for the rest technology adaption and imitation is the main source for technological improvements, the study of the long-run growth process of nations is certainly not only concerned with incentives of creating generic knowledge and technological innovations, but also with the diffusion of technology. The importance of international economic integration, particularly international trade and foreign direct investment, is highlighted especially. Finally, the relevant terms – chiefly the distinct modes of FDI – are specified.

2.1 Internationalisation: Transitory versus Secular Growth Effect

2.1.1 *The Neoclassical Paradigm*

Until the late 1980s the ‘Neoclassical Paradigm’ dominated both ‘International Economic Theory’ as well as ‘Growth Theory’.

In the canonical neoclassical growth model *without* technical progress the macroeconomic capital accumulation is prone to diminishing returns to scale. This means that each additional unit of the homogenous input factor capital contributes less to output than the precedent unit. In this setting, the economy reaches a steady-state equilibrium, characterised as equilibrium path where per capita consumption is constant when the marginal product of capital equals the rate of time preference.¹ The economy exhibits growth of output per capita, i.e. efficiency growth, and an increase in capital-intensity only in the transition time to the steady-state. The single possibility to introduce a permanent increase in a country’s growth rate is assuming *exogenous* technological progress that increases the efficiency of labour.²

In an open economy neoclassical scenery, the flows of the two homogenous input factors capital and labour are seen as being governed by international factor cost differences with factors flowing from the location of relative abundance to the place of relative scarcity. Of course this is only possible if there are no restrictions on the free flow. While theorists acknowledge the relative restrictiveness of labour mobility,³ the world has seen several liberalisation rounds in international capital flows. The early approaches to explain FDI and its consequences summarised FDI under the movement of homogenous capital from a country where it is relatively abundant to a country where it receives a higher return due to its relative scarcity. FDI is thus just another means of capital accumulation of countries. For example Brems (1970) develops a Solow-styled model accounting for capital movements in the form of two-way international direct investment. FDI is simply seen as second capital input factor. However, in the same way as the accumulation of domestic capital is governed by diminishing returns, also the accumulation of foreign but otherwise identical capital faces diminishing returns and thus transitory growth rate effects only (Neuhaus 2006).

In the canonical neoclassical model of international trade – the ‘Heckscher-Ohlin’ model – trade is seen as substitute for the free flow of factors. Assuming capital and labour being inter-sectoral but not internationally mobile, free international flow of goods ensures factor price equalisation at the end of all allocative adjustment

¹ Abstracted from depreciation.

² Harrod-neutral technical progress that is compatible with balanced growth.

³ This is not only due to legal barriers to migration, but also due to the fact that people are reluctant to move abroad only because of wage, i.e. factor price incentives.

processes initialised by trade liberalisation.⁴ In this sense, borders of countries or the existence of countries itself, are interpreted as artificial frictions to the optimum of an integrated world economy. Trade helps to circumvent these frictions such that all production factors are allocated to their most efficient use. The determinants of growth of trading economies are finally the same as those of a single closed economy. Importantly, accumulation by all countries again results in driving down the price of capital to a level that is consistent with a steady-state equilibrium growth path on the world level.⁵ Again, the only way to circumvent this growth ceiling is exogenous technical progress.

In economies that are open to international trade and foreign direct investment this exogenous technical progress might not only fall like manna from heaven but also flow into the country via its international economic linkages. Especially FDI is seen as an important source accessing modern managerial and organisational practises as well as high-end physical capital. New production plants set up by foreign investors are likely to deploy most efficient machinery and restructuring investment in acquired domestic target firms is presumed to make foreign affiliates of MNE more productive than their domestic counterparts.⁶ Furthermore, MNEs are found to be responsible of the major part of global R&D activity and have a higher relative share of professionals and technical workers (Markusen 1995). Also international trade via the import of state-of-the-art intermediates, particularly machines, is considered as possibility to enhance the growth performance of a country and to catch up with leading economies.

Nevertheless, in the neoclassical world with perfect competition, constant returns to scale and homogeneity of inputs and outputs, growth also in the presence of these international linkages remains unexplained and exogenously assumed. FDI

⁴ Without going into the further details of the model provided in every standard textbook, it is more accurate to say that conditional (productivity adjusted) factor price equalisation prevails only when the countries' capital-labour-ratios fall into the cone of diversification.

⁵ It should be noted here that this is of course a very simplified description of economic growth without technical progress in the Heckscher-Ohlin world. Referring to Ventura (1997), Acemoglu points to the essence of such a model: the world economy has standard neoclassical features whilst each individual country uses an AK technology but is too small to influence the terms-of-trade and thus factor prices. Factor prices are determined by world prices which entails that for each country factor prices are independent of accumulation decisions. This implies that countries with lower discount rates than the rest of the world can temporarily grow faster than the rest of the world because international trade temporarily prevents diminishing returns to capital as long as the country is small. Ventura (1997) suggests that this delivers a possible explanation for the 'growth miracles' experienced by the East Asian Tigers, where trade openness was paired with rapid capital accumulation. Yet, for the research focus in this dissertation, one conclusion is more important: the growth miracles are only medium-run. Eventually the individual growing country becomes too large, influences world factor prices and thus experiences diminishing returns itself (see Acemoglu 2009, Sect. 19.3).

⁶ The question if acquisition targets are acquired because of being more productive *ex ante* or if they become more productive upon acquisition is called 'selection problem' or 'selection bias'. Most studies controlling for the selection bias affirm that foreign affiliates become more efficient due to foreign ownership (see the review provided in Chap. 4.2).

as well as the import of intermediates could only affect a country's long-run growth rate under the premise that a constant positive rise in inflow is given.⁷

2.1.2 New Trade Theory, New Trade Theory and New Growth Theory

While the scientific community was discontent with the prevailing paradigm, it took until the late 1980s for researchers to be able to model imperfect competition and increasing returns to scale, that incorporate the advantages of mass production, in an analytically solvable general equilibrium framework. The model of monopolistic competition that influenced both trade and growth theory is based on the ideas of Robinson (1933) and Chamberlin (1933) and was developed in its modern form in the seminal contribution of Dixit and Stiglitz (1977).⁸ It gave rise to the approaches that are summarised under 'New Trade Theory' on the one hand and under 'New Growth Theory' on the other hand.

'New Trade Theory' was pivotally shaped by the seminal contributions of Krugman (1979, 1980) and Helpman and Krugman (1985).⁹ Despite identical technologies and factor endowments across countries, gains from trade are realised in these models due to the assumption of increasing returns to scale internal to the firm. The implications of the effects of international trade of two identical countries are analysed here in the same way as a doubling of the size of a single country. Essentially there are two subcases of the model, depending on the specification of the assumed utility function. Given a constant elasticity of substitution between product varieties and thus a constant price elasticity of demand, there is neither a selection nor a scale effect induced by trade, i.e. no firm can increase its volume of production and no firm drops out of the market. The welfare gains associated with trade liberalisation found here stem from an increase in the variety of available products in presence of the assumed Dixit and Stiglitz (1977) love-of-variety utility function.

In the other more realistic setting, demand becomes more elastic the more competitors enter the market, and the scale of production of established firms is larger with trade than in autarky. Constant endowments of the two countries assumed, this is only possible when some firms drop out of the market. Thus the number of produced varieties in the free-trade equilibrium is less than the sum of

⁷ According to the neoclassical growth model, a non-permanent increase in technology entails only transitory growth rate effects.

⁸ The fundamental influence of the so-called 'second' monopolistic competition revolution on macroeconomics, international trade theory, growth theory and economic geography is set out in Brakman and Heijdra (2004).

⁹ Krugman [...] most clearly and forcefully articulated the revolutionary nature of this new approach for the theory of international trade. (Prize Committee of the Royal Swedish Academy of Sciences (2008, p. 4).

the autarky numbers. The gains from trade identified here are twofold: (i) trade liberalisation induces scale and selection effects which induce a rise in real wages and (ii) the loss of local varieties is more than compensated by the import of foreign varieties.

One of the most important achievements of ‘New Trade Theory’ is that it explains the occurrence of intra-industry trade. Neither classical nor neoclassical trade models deliver reasoning for this empirically most important type of trade.¹⁰ Still there are other key production and trading patterns that cannot be explained by this approach: within the same narrowly defined industries, firms differ with respect to their size and productivity; nevertheless they coexist; some firms within a sector do trade and others do not; and there is growing intra-firm trade as well.¹¹ An additional caveat to the model is that it does not explain which firms drop out of the market given that all firms are identical with respect to their technology. Also regarding productivity improvements and thus growth implications of countries, the model’s explanatory power is rather poor: despite the occurring selection and scale effects, there is no change in the average productivity on the aggregate induced by trade liberalisation when firms use the same technology before and after liberalisation.

These problems are addressed by a path-breaking extension to ‘New Trade Theory’ provided by Melitz (2003) and often facetiously called ‘New New Trade Theory’. By introducing fixed trade costs and importantly *firm heterogeneity* into the basic set-up of firm-level economies of scale, Melitz (2003) is able to accommodate for these empirical production and trading patterns and also to explain the selection process induced by trade liberalisation.¹² Heterogeneity of firms itself is proxied by attributing a distinct productivity level to each individual firm. Already when concentrating on the closed economy case, firms are subject to a selection process in the sense that only the most efficient firms are able to establish themselves in the domestic market.¹³ When trade is introduced in this model, the productivity threshold for entering the domestic market is moved up and firms at the end of the productivity spectrum are forced to exit. Besides this selection effect to the domestic market, there is selection into the foreign markets. Only the most efficient firms earn enough extra-profits by exporting to bear the additional entry costs to each of the foreign markets. Concerning the number of varieties available for consumers before and after trade liberalisation, no exact predictions are deducible from the model. The positive welfare effects implied by this model originate from an increase in real wages as well as an increase in the aggregate productivity

¹⁰ Of course the importance of intra-industry trade varies between countries, sectors and with trading-partners. For most developed countries, intra-industry trade dominates inter-industry trade. Especially in manufacturing sectors and their trade-relations with other developed countries (OECD 2002, Chap. 6).

¹¹ Ibid.

¹² The basic model rebuilds the selection effect and the scale effect even with assuming a constant elasticity of substitution of product varieties.

¹³ These are the firms whose aggregate expected profits are positive.

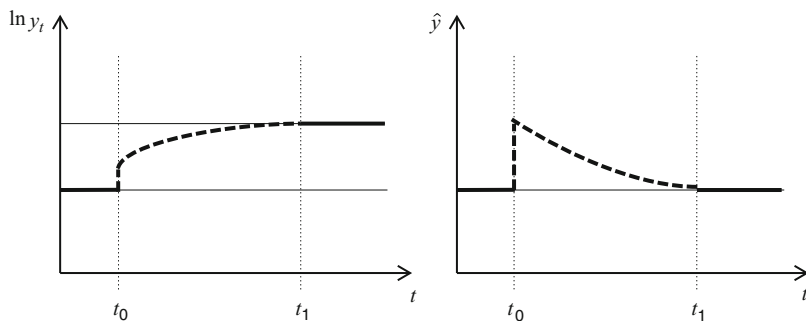


Fig. 2.1 Productivity level and productivity growth rate effects in Melitz (2003) (Source: Based on Gustafsson and Segerstrom (2010). Note: The time point of trade liberalisation is t_0 . The new steady-state is reached after a transition period in t_1 . y and \hat{y} denote the level and the growth rate of aggregate productivity)

level.¹⁴ With opening up the domestic market for international trade, there are changes in market shares of established firms. Concretely, the domestic market share for each domestic firm drops due to the foreign competitors – the least efficient even exit. The most productive, however, are compensated by gaining access to the foreign market. In sum, there is a shift of market shares in favour of more productive firms and thus a direct effect of trade liberalisation on aggregate productivity.¹⁵

In a sense the productivity level of a country is thus endogenously determined by the degree of openness or – to put it differently – productivity growth is influenced by liberalising trade. In spite of this, concerning the research focus – permanent growth effects – the implication of openness here is still not different from preceding trade models. First, the productivity levels of firms are indeed individual and randomly determined, but again they are exogenously given. Second, the model once more only accounts for static gains from trade: trade is shown to improve the allocation of resources in the world economy; here, the only difference is that the reallocation is happening between individual firms. The reallocation entails changes to the growth rate of productivity but these changes are only temporary in nature. Figure 2.1 illustrates the permanent increase in the level of aggregate productivity (y) following liberalisation (in t_0) and the temporary increase in the growth rate ($\hat{y} = d(\ln y_t)/dt$) during the transition period $\overline{t_0 t_1}$. There is no growth rate effect on productivity in the long run which is indicated by the two steady-state paths (before t_0 and after t_1) having the same slope (zero).¹⁶

Nevertheless, the influence of this more realistic model accommodating for heterogeneity should not be underestimated. Together with the increasing

¹⁴ Melitz shows that even with a total decrease in the number of available varieties, an overall positive welfare effect prevails.

¹⁵ A detailed description of the model is given in Hofmann (2009).

¹⁶ Note the jump in per capita income in t_0 .

availability of firm-level data and the tools of microeconometrics, it delivers a powerful tool to explain apparent economic patterns. Moreover, it is the workhorse model for further important contributions introducing heterogeneity in various fields of economic research. Its significance for the linkage between international openness and economic growth will become clear when discussing models that introduce heterogeneity in the trade-growth nexus (e.g. Bustos 2011; Gustafsson and Segerstrom 2010; or Unel 2010) in Chap. 3, or models that explain the determinants of multinational activity which is seen as an important vehicle for technology transfer (e.g. Antras and Helpman 2004; or Nocke and Yeaple 2007) in Chap. 4.

Also in the field of Growth Economics, the introduction of monopolistic competition emerged as a fruitful way of dealing with the problem of the neoclassical growth paradigm in overcoming the irreconcilability of increasing returns with a consistent theory of income distribution.¹⁷ The simplest form of modelling endogenous technological change is provided by the so-called ‘product variety models’, where purposeful R&D investment entails the development of a new product. These models accommodate the fact that firms have market power and earn monopoly rents on discoveries while still many firms, i.e. many products, coexist in the market Romer (1994).¹⁸ The product variety approaches can be further subdivided in two groups which are not very different from a modelling perspective.

The first is concerned with the increase in the variety of intermediate inputs, which is seen as a form of process innovation, the other is dealing with (final) product innovations. Both of them are variants of the old idea that growth is based on increasing returns due to specialisation or as Adam Smith formulated it: ‘Growth is rooted in the increasing division of labour’. The invention of new intermediates raises the productivity of final good firms, the increased availability of final goods leads to a rise in real income when consumers have love-of-variety or ideal-variety preferences. The former idea is associated with the seminal contributions of Paul M. Romer,¹⁹ the latter was put forward by Grossman and Helpman (1991a). However, Adam Smith also noted that ‘*the division of labour is limited by the extent of the market*’. So when talking about the effects of international trade on economic

¹⁷ Romer (1994) adds that the passing of perfect competition was essential to account for the sum of five basic facts that were taken for granted but were not accounted for before the rise of New Growth Theory. These are the facts (1) that there are many firms in the market economy; (2) that innovations can be used by many people at the same time; (3) that it is possible to replicate physical activity; (4) that technological progress comes from things people do; and (5) that many individuals and firms have market power and earn monopoly rents on innovations.

¹⁸ The idea of the reinterpretation of the Dixit and Stiglitz (1977) love-of-variety preferences as production function where the output of final consumption goods is an increasing function of the total number of specialised intermediate inputs used by final good producers is attributed to Ethier (1982) (Romer 1987; see also Ethier (2004) for short historical review).

¹⁹ Chiefly Romer (1987), since in this contribution the essence of specialisation is most clearly developed. Particularly it ignores external effects due to spillovers of knowledge. Romer’s other seminal contributions rely on learning-by-doing with spillover effects (Romer 1986) or combine specialisation with knowledge externalities to explain endogenous growth (Romer 1990).

growth, it is essential to reckon *the market size effect of international openness*, which is the first channel of influence of international trade on long-run economic growth discussed in Chap. 3.

A second strand of ‘New Growth Theory’ that is highly relevant to the long-run growth implications of international openness are the class of ‘Schumpeterian growth models’. Like product variety models, they account for the fact that firms have market power while still having many firms in the market. In contrast to them, however, they do not assume away product obsolescence. The idea is that it is the nature of innovation to kick older products or intermediates out of the market since the new discovery is assumed to be of better quality than the hitherto existing.²⁰ Innovation is a process of creative destruction, as Joseph A. Schumpeter (1942) first put it, which entails that owners of patents of previously leading techniques lose their monopoly rents in train of new discovery. First generation Schumpeterian models placed special emphasis on this monopoly-rent destroying effect of vertical innovation and predicted that increased product market competition would discourage the incentive to innovate by reducing the net rate of return on innovation. In the context of internationalisation, this means that increased competition induced by international trade potentially discourages innovation and leads to a reduction of the productivity growth rate.²¹ New approaches to the Schumpeterian paradigm of endogenous growth doubt that this unambiguously negative causation is mandatory. They allow innovation activity not only for potential entrants (outsiders), but also for the incumbent monopolist (insider) and account for the difference between post- and pre-innovation rents. The incentive to innovate, which is the difference between post- and pre-innovation rents, may be higher for the insider than for the potential entrant who has zero pre-innovation rent and post-innovation duopoly rents. Increased international competition, whether caused by foreign MNE presence or by import competition, may foster innovation by reducing the pre-innovation rents more than post-innovation rents, thus creating incentives for incumbent firms to spend more on R&D in order to escape competition. The overall effect on aggregate innovation-intensity and hence the aggregate growth rate might be positive. This second potential channel of international trade and FDI on economic growth (*competition effect*) is also discussed in Chaps. 3 and 4 respectively.

As Romer (1987) states, at least since the publication of Kenneth Arrow’s 1962 paper on learning-by-doing, another tractable framework for the study of increasing returns in a dynamic model is given. Its underlying idea, the introduction of externalities in a competitive equilibrium to account for increasing returns on the aggregate, is already found in Alfred Marshall’s ‘Principles of Economics’ of 1890. Externalities and spillovers are central to models of endogenous technological

²⁰ One also speaks of vertical innovation in contrast to horizontal innovation.

²¹ To make it clear, this competition effect does not refer to the efficiency level effect of firms being kicked out of the market through the selection effect of trade. That is that only the most efficient stay in the market like in Melitz (2003). It refers to the effect competition has on the innovation incentives of firms which transforms into efficiency growth rate changes.

change and growth and also provide the richest set of possible linkages between international openness and long-run growth effects.²² Both internationalisation via FDI and MNE or via the international exchange of final goods and intermediates offer manifold starting points for discussing knowledge and technology diffusion across borders. This *spillover effect of international openness* is also analysed in the theoretical underpinnings in Chaps. 3 and 4. For this, however, it is necessary to emphasise the role played by the two fundamental pillars of growth theory – innovation and imitation – in the following section.

2.2 Growth Through Innovation, Adoption and Imitation

In a world where only few countries like the US, Japan and Germany are seen as technological leaders constituting and advancing the world technology frontier (e.g. Griffith et al. 2004a; Acemoglu et al. 2006) by own innovation activity, the question arises how it is possible for other countries to grow at all. It is precisely this question where the importance of knowledge spillovers and other technological externalities arises most clearly.

There are two pillars within modern economic growth theory that strive for an explanation of macroeconomic growth and that need to be unified to create a full picture of world growth and world growth differences. The first one is the theory of generic technological progress by purposeful invention and innovation that creates endogenous growth on the aggregate level. Since the process of innovation is central for these approaches, most models concentrate on the closed economy case. The second pillar is the strand of growth models that deals with the theories of technology adoption, imitation and diffusion. For the majority of developed and all developing or transition countries, this second pillar is the main source of technological progress and successful catching-up. In this spirit, a comprehensive study of growth implications of international trade and foreign direct investment must not only consider possible channels of influence on generic innovative activity, but also address explicitly the issue of technology diffusion promoted by international openness.²³

²² The reader should recall the essential differentiation between pecuniary and non-pecuniary (or technological) externalities. The free-of-charge externalities either work through the price system or not. For example the increased input variety due to trade liberalisation that is a form process innovation is mirrored in prices while copying the marketing strategy of a foreign competitor is not.

²³ Acemoglu and Ventura (2002) is a good example for the interplay of the two pillars. The world economy exhibits endogenous growth with the growth rate determined by the investment decisions of all countries. All countries face AK-technologies with different parameter values. When a country is richer it accumulates faster and thus has a lower rate of return on capital, worsens its own terms-of-trade and eventually converges to the world growth rate. While it is international trade that ensures a common long-run growth rate for all countries (pillar two), growth itself is explained by the underlying AK-technology endogenous growth model (pillar one).

As already highlighted above, the import of intermediate products and even more so the presence of MNE are traditionally seen as major channels for the international diffusion of technology and can be interpreted in the neoclassical way as exogenous technical progress embodied in the machines imported or installed by foreigners. However, Acemoglu (2009) raises the question, why we still see such huge differences in the growth success of follower countries that all adhere to the strategies of 'importing technology' or 'attracting FDI' from the rest of the world.²⁴ By this, he addresses the fundamental criticism on neoclassical growth being unable to explain quantitatively large differences in cross-country per capita income and growth performance. There must be important discrepancies in decisions and abilities of countries concerning technology adoption and technology use. Starting with Kaldor's concept of the 'technical dynamism' of nations²⁵ and Griliches (1957) study of local economic conditions affecting diffusion; over Nelson and Phelps' pivotal contribution that stresses the importance of human capital for the ability of adopting new technologies (Nelson and Phelps 1966), to modern approaches that deal with institutions as barriers to technology adoption,²⁶ or with the need of appropriateness of technologies for being adoptable;²⁷ economic growth theory already provides some explanations for this discrepancies in technology adoption decisions and abilities that shed light in the black box of technology diffusion.

More than international trade with goods, services and intermediates, multinational enterprises are an important source for the diffusion of technological knowledge across countries today. In the field of international economics there has been an upsurge of contributions dealing with MNEs and the international fragmentation of production within MNEs beginning also in the late 1980 when New Trade Theory started to rise. Central for this development are the contributions of Jim Markusen and his co-authors. Their theories are thoroughly discussed in Chap. 4 together with more recent approaches to the multinational firm. Paired with the

²⁴ He names Portugal and Nigeria as examples.

²⁵ 'Technical dynamism' is an expression for the progressiveness of a nation which comprises its inventive talent, its risk affinity and its adaptability. In Kaldor's approach, it links the rate of change in investment with the rate of change in aggregate productivity and thus is an intuitive concept for the general environment that explains an economy's ability to take advantage of new technologies and to translate them into economic progress (Kaldor 1957; Kaldor and Mirrlees 1962).

²⁶ See i.a. Parente and Prescott (1994). Acemoglu et al. (2007) deal with the influence of contractual difficulties to technology adoption.

²⁷ Appropriateness is discussed either depending on the compatibility of frontier technology with the needs and resource endowments of follower countries or depending on the technology gap between frontier and follower countries. While some authors stress that a certain technology gap has to exist for diffusion to take place, others find that the gap must not be too large for followers being able to absorb frontier technology. Acemoglu (2009, Sect. 18.4) provides a discussion of some complementarity prerequisites as exogenous (geographical) conditions, capital-intensity and skill endowment. The other idea that 'distance to frontier' matters also occurs in the new Schumpeterian models of endogenous growth: whether innovation rises with competition or not depends on the technological gap between leading and following countries, sectors or firms (Aghion and Griffith 2005).

increasing availability of micro-level data on productivity, R&D and innovation activity, they present an important step forward to open up the black box of technology diffusion. By analysing the possible spillover effects of MNE presence for other firms in the host country, the empirical contributions in this field show that the human capital threshold or the technology gap play indeed central roles for incoming FDI being beneficial for the domestic economy.

In the last years, also other aspects of international diffusion of technology and international knowledge spillovers, conveyed by international economic integration, are in focus of research. The topics ‘learning-by-exporting’ (LBE),²⁸ and the ‘globalisation of R&D production’²⁹ are not entirely classifiable to one of the above discussed considerations within New Growth Theory. Providing additional explanations for a possible connection of trade, FDI and growth, they combine the competition effect, the spillover effect, and the market size effect of international integration and are thus also subject-matter to the discussions of the openness-growth-nexus in Chaps. 3 and 4. However, before coming to these theoretical underpinnings, it is necessary to clarify the relevant terms used in this dissertation first.

2.3 Modes of the Internationalisation of Firms

Economic globalisation or economic integration of countries is mainly captured and measured by international trade flows, foreign direct investment (FDI), foreign portfolio investment (FPI) and income payments to foreign nationals. However – in the search for real economic growth effects of internationalisation – neither all of these aspects are of importance nor is this list of aspects complete. As this dissertation concentrates particularly on international trade and foreign direct investments, specifically these two terms have to be defined and confined from other related concepts.

In the literature one often finds that firms intending to serve foreign markets essentially face two stages of decision-making. At first, a company chooses whether to produce at home and to export or whether to carry out production abroad and to sell from there. This is the decision between being a ‘pure’ exporter or to engage in FDI. Exporters and foreign direct investors are then named ‘internationalised firms’ (IF) and are marked off from firms producing domestically for the home market (domestic producers).³⁰ At the second stage, if the decision is made in favour of going international via FDI, a firm faces various possibilities of organisational forms that fall under this broad category. With respect to the wide scope of

²⁸ ‘Learning-by-exporting’ roots, as will be explained below, in dynamic scale effects as learning-by-doing as well as in technological externalities due to knowledge spillovers.

²⁹ The increasing globalisation of R&D Production is mainly attributed to the spread of MNE. See Chap. 4.2.

³⁰ For example Mayer and Ottaviano (2007, 2008).

arrangements firms use to internationalise innovation, production and distribution in business practise, this two-stage categorisation is too narrow nowadays. In fact it is more appropriate to *distinguish at a more general level, between 'equity' and 'non-equity' arrangements of 'going international'*.

Equity arrangements refer basically to foreign direct investment but it is essential to further differentiate between the subcategories 'greenfield investment' (GI), 'mergers & acquisitions' (M&A) and 'joint ventures' (JV). The terms 'subsidiary', 'associate', 'affiliate' and 'MNE' also need some defining explanations. The subsequent paragraph will give an overview about the organisational forms and provides even more detailed distinctions for having a workhorse definition of FDI and in particular M&A within this dissertation.

Non-equity engagements on the other hand comprise a broader set of transactions than only exporting and importing. The literature additionally names licensing, franchising and offshore outsourcing.^{31, 32} The export and import of goods and services, final or intermediate, mark the working definition for '*international trade*' in the subsequent analyses. Offshore outsourcing, which is viewed as a contractual arrangement between legally independent entities in different countries that results in firm-level imports of *intermediate* goods and services, is contained therein. The other types of arm's-length arrangements on the contrary are not subject of consideration in this contribution.³³

Using the expression 'going international' instead of 'serving the foreign market' additionally reflects that the intension of internationalisation is not limited to the international supply of products. For example, vertical FDI may entail exporting final goods and intermediates back home; offshore outsourcing brings benefits of cost reduction and quality enhancement of intermediates that

³¹ Some authors also call this 'offshoring'. This contribution sticks nonetheless to 'offshore outsourcing' since offshoring also comprises 'captive offshoring' (in-house production abroad) which is indeed FDI.

³² This list is enlarged by some authors in different ways. For example strategic alliances are mentioned; others divide FDI in M&A, GI, JV and other non-M&A with the latter including plant expansion, an increase in equity stakes and the acquisition of real estate (Alba et al. 2010).

³³ To give a short definition: *Franchising* as defined by Caves and Murphy (1976) is an agreement lasting for a definite or indefinite period in which the owner of a protected trademark entitles another economic entity the right to operate under this trademark for the purpose of producing and distributing products or services. The intangibility of the rented asset and the decentralised production and distribution processes are constitutive features. *Patent and know-how licensing* refers to arrangements where an innovative firm grants other companies the right to use a patent or less codified technological know-how in its own production process. More concrete, license contracts contain rules for the transfer of know-how for the manufacture, assembly, test and product support of the product from the licensor to the licensee; sale and supply of components, parts and spare parts related to the product; provision of training to the personnel of the licensee as well as the provision of technical assistance with respect to manufacture, assembly, test and product support and after sales services of the product. Often it also incorporates the exclusive right of the licensee to use the transferred know-how and to distribute and product support the product within the territory. For the interested reader it is referred to the World Investment Report 2011 that focuses on non-equity modes of international production (UNCTAD 2011).

are finally used for the home market; firms use their foreign affiliates as so-called ‘export-platforms’ to serve third countries; and even more complicated constellations with various (self-owned or not) production facilities shipping intermediates between each other for further processing (subsumed under the fashionable term ‘international fragmentation’) have found their way to the international economics literature.³⁴ To summarise, it is more appropriate to speak of ‘*the modes of internationalisation of firms*’ than of ‘*the modes of entering and serving the foreign market*’ in order to carry out an analysis of the implications for economic growth and technological change.

2.3.1 Foreign Direct Investments and the Multinational Enterprise: Concepts, Definitions and Demarcations

Equity modes are in general differentiated by the prevailing equity share of the foreign investor. Foreign portfolio investments (FPI) are distinguished from foreign direct investment (FDI) by the 10 % equity threshold.³⁵ Still it is not the 10 % per se that constitutes FDI or FPI, but the different objectives behind these forms of investment. According to the ‘Sixth Edition of the IMF’s Balance of Payments and International Investment Position Manual’ (IMF 2009), which is based on the ‘OECD Benchmark Definition of Foreign Direct Investment 2008’ (OECD 2008a), FDI is distinguished from FPI, financial derivatives (other than reserves) and employee stock options, other investment, and reserve assets with respect to the dimensions of ‘*relationship between parties*’ and ‘*motivation for investment*’ (OECD 2008a, p. 99).

2.3.1.1 FDI and FPI

In this sense, direct investment is a category of cross-border investment where a resident enterprise in one economy (direct investor) invests in an enterprise (direct investment enterprise) located in another country with the objective of establishing a lasting interest.³⁶

Foreign Portfolio Investment, which involves debt or equity securities, on the other hand is not associated with control intentions, but with purely financial objectives. UNCTAD (2000) adds that while with FPI the long-term relationship that reflects the investors’ lasting interest is ruled out by definition, portfolio

³⁴ Chapter 4.1 discusses the firm-level, sectoral and macroeconomic determinants of different forms of international engagement of firms via equity arrangements, differentiating between horizontal, vertical and other motivations.

³⁵ [...] *Acquisitions involving less than 10 per cent constitute portfolio investment* [...] (UNCTAD 2000, p. 99)

³⁶ The forms of investment classified as FDI are equity capital, the reinvestment of earnings and the provision of long-term and short-term intra-company loans (between parent and affiliate enterprises) (IMF 2009).

transactions can nevertheless be accompanied by management control right stemming from other non-equity arrangements. Nevertheless, in order to establish an international workhorse definition to make statistics comparable across countries, the benchmark definition appoints the 10 % equity threshold to be the relevant distinction between FPI and FDI.

2.3.1.2 Subsidiary, Associate, Affiliate

The ‘lasting interest’ that is constitutive for FDI comprises the existence of (i) a *long-term* relationship and (ii) having *control* or a *significant degree* of influence on the management of an enterprise that is resident in another economy. Control or influence may be achieved directly, i.e. owning equity that gives voting power, as well as indirectly, i.e. having voting power in another enterprise that has voting power in the target enterprise. ‘Control’ exists if the direct investor owns more than 50 % of the voting power and the term a ‘significant degree of influence’ is used for owning from 10 % to 50 % of the voting power in the direct investment enterprise (IMF 2009). Accordingly, it is also distinguished between a ‘subsidiary’ where the direct investor is able to exercise control and an ‘associate’ over which the direct investor is able to exercise a significant degree of influence, but not control. The term ‘affiliate’ even if used rather unsystematically in the literature, is referring to subsidiaries and associates, but also to the direct investor itself as well as to fellow enterprises.³⁷

2.3.1.3 FDI Versus MNE

A further remark has to be made about the relation of FDI and multinational enterprises (MNE). A MNE usually comprises companies or other entities established in more than one country which are linked in a way that they may co-ordinate their operations in various ways (OECD 2008b). The distinction between FDI and MNE is concerned with differentiating between stocks and flows. FDI stocks are estimated by cumulating FDI flows over time and are presented at book value or historical cost. More concrete, for foreign subsidiaries and foreign associate companies this is (i) the market or book value, derived from the balance sheets, and reserves (retained profits) attributable to the direct investor; (ii) loans, trade credit and debt securities (bonds, notes, money markets instruments, financial derivatives etc.) due from the subsidiaries and associates to the direct investor, including dividends declared but not yet paid to the direct investor; minus (iii) loans, trade credit and other liabilities due to subsidiaries and associates from the direct investor (Kommerskollegium 2008). So the set-up of or the transformation to a foreign affiliate is indeed the result of cumulated FDI flows. FDI stocks are an indirect activity measurement of MNEs

³⁷ See IMF (2009) for details on the latter.

outside their home countries. Nevertheless, in general MNE exist and carry out production and employment without additional FDI flows and FDI flows do not necessarily entail an increase of production or employment (Blomstrom et al. 1994). A MNE is a parent company that (i) engages in foreign production through its subsidiaries or associates located in several countries, (ii) exercises direct control or influence over the policies of its subsidiaries or associates, and (iii) implements business strategies in production, marketing, finance and staffing that transcend national boundaries (Root 1994). However, in the present work FDI and MNE will be used interchangeable. For example, in the existing literature most authors talk about the ‘knowledge flows from FDI’ instead of the ‘knowledge flows resulting from being part of a MNE’ (Markusen 2008).

2.3.1.4 GI, M&A and JV

Traditionally, FDI is grouped in mergers & acquisitions (M&A) and non-M&A (e.g. Nocke and Yeaple 2008). More recently authors tend to use an even finer definition, distinguishing between (i) greenfield investment (GI), (ii) joint ventures (JV), and (iii) mergers & acquisitions.³⁸ Figure 2.2 is provided for distinguishing and structuring these equity modes.

Greenfield investment is characterised by building or establishing completely new facilities that are wholly-owned by the investor afterwards.³⁹ Mergers & acquisitions are concerned with the change in ownership of existing assets (equity). While ‘merger’ means that two or more firms from different countries fuse, become a new legal entity and thus cease to exist themselves, an acquisition is the business transaction described above as gaining control or a significant degree of influence over a foreign entity by purchasing a certain fraction of the equity that gives voting power. The foreign entity, which could be an entirely foreign-owned company in advance or be already partly-owned by the acquirer, thus becomes a subsidiary or associate of the direct investor. In Fig. 2.2, it is further differentiated between full or outright acquisitions (acquiring 100 % equity), majority acquisitions (acquiring 50–99 % equity), and minority acquisitions (acquiring 10–49 % equity). With minority acquisition, a foreign facility becomes an associate to the acquirer; outright and majority acquisitions result in subsidiaries.

Based on Raff (2008) a ‘joint venture’ can be defined as a mechanism (mostly contractual) for combining complementary assets owned by separate firms. These

³⁸ For example Raff et al. (2009). Alba et al. (2010) even adds a fourth category ‘other FDI’; it refers to plant expansion, increase in equity stake, and acquisition on real estate.

³⁹ The term is a metaphor for building a facility on a ‘green’ field.

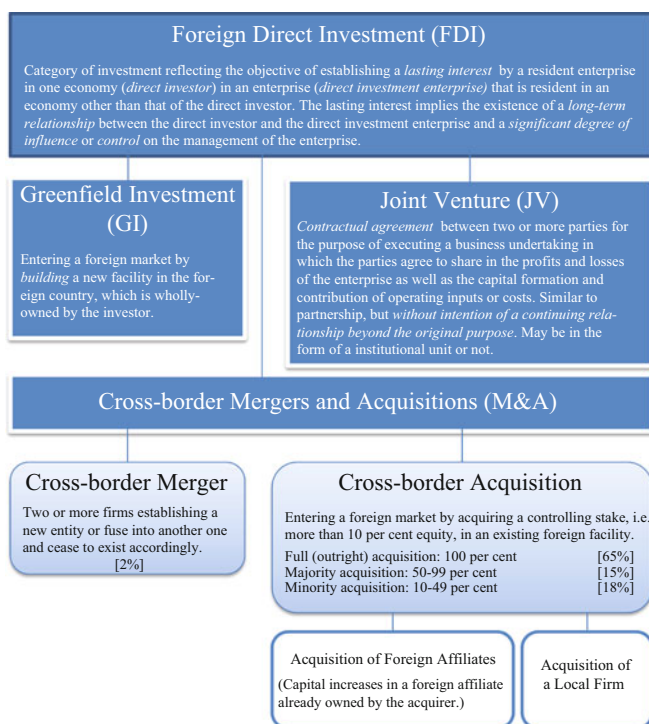


Fig. 2.2 FDI – definition and subgroup classification (Source: Own illustration based on the definitions in OECD (2008a), IMF (2009) and UNCTAD (2000). Percentage numbers are calculated as average based on numbers given for the period 1987–1999 by UNCTAD (2000))

assets are ‘joint’ in a complete new or legally independent ‘venture’ (entity) of which the JV partners share the equity.⁴⁰ The partners share profits, losses and all set up or operating costs. Importantly, the JV is created for a particular purpose, e.g. developing and producing a new machine tool and there is no intention to continue the JV after completion.⁴¹ The assets contributed by the partners can either be tangible, such as machinery, or intangible, such as technological know-how and market-specific information.⁴²

⁴⁰ To be even more precise it could be further distinguished between equity joint ventures and non-equity joint ventures governed by contractual arrangements as licensing and management contracts. Since the latter is subsumed under non-equity modes of entering the foreign market in this dissertation the term JV here refers to equity joint ventures.

⁴¹ Business relationships that are rather on-going and long-term in nature are better addressed by the term ‘(business partnership)’.

⁴² A common example is that in JVs with Chinese firms the latter provide land, labour and production facilities while the partners from Western countries deliver management, engineering, sales and distribution know-how.

2.3.2 *Numbers and Caveats*

It is of particular interest to what extend the three subgroups of FDI account for worldwide FDI. M&A accounted for 89 % of FDI in developed countries and for about 76 % in the world in the period from 1998 to 2001, with a steady increase in these shares since the 1980s (Barba Navaretti and Venables 2004).⁴³ The share of M&A sales in FDI inflows accounted for about 80 % while the share of cross-border M&A purchases in FDI outflows even reached nearly the 95 % level in 2000 (UNCTAD 2000). Kang and Johansson (2000) show that M&A is taking place in all sectors with most of it being intra-sectoral in nature.⁴⁴ All of these numbers imply that M&A are rather outperforming GI in entering foreign markets.⁴⁵ A few caveats should be named concerning these figures.

The first are already given in UNCTAD (2000): there are various forms of financing M&A which are not reported in FDI data; contrarily to M&A, FDI data are reported on a net basis and payments for M&A are often split over several years. These problems led for example to the fact that the share of M&A in FDI for developed countries exceeded 100 % in 1999. Nevertheless it can be concluded for the pre-millennium period that the share of M&A in FDI was rising for all groups of countries. This development also prevailed for some following years.

However, with respect to the world economic and financial crisis in 2008, this number should also be taken with care. According to the 'World Investment Report 2011' (UNCTAD 2011), greenfield investment has become much larger than cross-border M&A. While in 2007, M&A was still higher in volume than GI worldwide, GI definitively outperformed M&A in the crisis year 2008 and later on. Still keeping the above given calculation problems in mind, this structural turn may be due to a long-term shift of FDI deals from developed to developing countries, where traditionally the share of GI is higher than that of M&A.⁴⁶ Certainly the financial crisis also had a short-term influence in asymmetrically causing a rather large drop in M&A but leaving worldwide GI rather stable.

Seldom official statistics include joint ventures in their analyses as well. Given the complicated calculations for M&A and GI, UNCTAD does not even report JV separately. To give an impression, Raff et al. (2008) report that of the investments of Japanese manufacturing MNEs in the period from 1985 to 2000, wholly-owned affiliates account for 44 %, joint ventures for 39 %, and M&As for 17 % respectively. Unfortunately, their equalisation of GI with wholly-owned affiliates⁴⁷ is not

⁴³ UNCTAD (2000) even reports that the ratio of total cross-border M&A to the value of global FDI was about 83 % in 1999.

⁴⁴ See also UNCTAD (1998), World Investment Report: Trends and Determinants.

⁴⁵ This is only true for developed countries and the global average. For developing countries the number is below 40 % in 1999 whereas a steady increase is observable here as well.

⁴⁶ This shift is a trend not limited to the crisis years. UNCTAD (2011) speak about emerging economies as the new FDI powerhouses.

⁴⁷ 44 % is exactly the number in their Table 1 for GI.

compatible with the above discussed benchmark definitions. It is probable that some of the wholly-owned affiliates are due to full or outright M&A. This is also supported by the numbers shown in square brackets in Fig. 2.2 which are calculated on the basis of records delivered by UNCTAD (2000) for the period from 1987 to 1999. Even if the shares of GI, M&A and JV in worldwide FDI might have changed considerably, it is likely that the within M&A proportions are stable over time. It is shown that of all M&A only 2 % are mergers, whereas outright acquisitions account for 65 %. Taking the latter together with majority acquisitions, the acquisitions that entail ‘control’ in the direct investment enterprise account for 80 % of total M&A. For developing countries, however, greenfield investment and cross-border minority M&As are preferred to cross-border majority M&As.

A warning to not mix up stock and flows is indicated here. Some authors take a different route than the above introduced official international statistics and use a somewhat different FDI mode categorisation. I.a. Dikova and Brouthers (2009) differentiate between the choice of entry mode and the choice of the desired level of ownership. This two layer decision results in separating GI versus M&A flows on the one hand (entry mode) and wholly-owned foreign entities versus JV stocks on the other hand (ownership level). This categorisation is not convincing. While GI flows entail wholly-owned affiliates by definition, M&A flows result in various ownership levels – 100 % or less – as set out above. Additionally, not all of the less than 100 % equity acquisitions can be referred to as being joint ventures. The short-term business project character, which is defining for JV, should always be taken into account.

2.3.3 Benefits and Risks of M&A

A frequently advanced concern of politicians, media and people in target countries of M&A deals is that mergers and acquisitions might not provide long-term benefits but might even be harmful for the local economy. This is due to the fact that (parts) of an existing firm are acquired. No enlargement of production or employment is expected. Simple transfer of ownership right does not increase productive capacities. Fears of capital stock and employment reductions, loss of technological assets, crowding out of domestic competitors, and market concentration are expressed. In contrast stand greenfield investment which is exactly characterised by building or establishing completely new facilities involving capital and jobs. This critical view is not reasoned well. First, there are different motives leading to the decision for a new plant instead of M&A (see Chap. 4.1), which may entail completely different ex post implications concerning the benefits for host countries. Secondly, nothing precludes that M&A is followed by enlargement of production and employment. If it is not, one has to ask for possible efficiency gains also contributing to the host country’s performance. Third, M&A potentially are accompanied by various other long-run beneficial effects for the host economy as for example technology transfer and knowledge spillovers. This is precisely the

topic for the literature review in Chap. 4: discussed are the determinants of various forms of FDI (Chap. 4.1) as well as their implications for the host and sending country (Chap. 4.2). The empirical contribution in Chap. 6 then draws on these considerations and analyses the assets and drawbacks of cross-border acquisitions on target firms' technological basis on the firm level.

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