Assessing the impact of trade liberalisation on children:
a conceptual framework

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1 Introduction

This note outlines a conceptual framework to guide research assessing the impact of trade liberalisation on children in Ethiopia, India, Peru and Vietnam. It identifies the main channels through which trade liberalisation can impact on children's, particularly poor children's, well-being. It also describes the types of methods and data which can be used to describe and – in certain cases, measure the magnitude of – the effects arising through each channel.

It is worth stressing at the outset that the complexity of the research task. Tracing the effects of a change in macro-economic policy, such as trade liberalisation, through to individual households is a complicated exercise (although much progress has been made in recent years in the development of methods and collection of necessary data). In this case the task is even harder, however, because of the need to trace the effects of policy change through to different members within the household, and in particular through to children. Realism is therefore required about the sorts of results one can be expected to generate. This is particularly so given the time and resource constraints the research carried out for this study was subject to.

Despite the difficulty of the research, there are potentially important policy implications. If children, particularly poor children, were adversely affected by liberalisation, there would be a strong case for introducing policies complementary to liberalisation which offset that impact in some way. This might be through short-term or long-term measures. Short-term measures include increased transfer payments or increased provision of subsidised public

services, while longer-term measures include reducing labour market rigidities and/or providing retraining to allow individuals to move from declining sectors into expanding sectors. If any adverse effects of liberalisation were mainly short-term in nature, there would also be a case for making the implementation of trade reforms more gradual over time. Finally, in some special circumstances, there could be a case for altering the proposed trade reforms themselves.

2   Basic approach

Our basic approach is summarised in Figure 1, which is a simplified and scaled-down version of Figure 1 in Waddington (2004). The figure shows three sets of relationships: the effects of policy changes on macro-economic variables; the effects of macro-economic variables on household-level variables; and the effect of household-level variables on children. By gathering information and analysing each of these sets of relationships, one can 'trace through' the effects of the liberalisation of trade in any one commodity or group of commodities on children in any one household or group of households. This can in principle be done at quite a disaggregated level, at the level both of households (e.g. rural vs. urban, rich vs. poor) and children (e.g. boys vs. girls).

On the far right-hand side of Figure 1 is child welfare, which is the variable of ultimate interest. By child welfare, we mean to the ability of children to achieve the basic rights set out in the UN Convention on the Rights of the Child: to survive, to develop to the fullest, to be protected from harmful influences, abuse and exploitation, and to participate fully in family, cultural and social life.

Moving one step to the left, we have those household-level variables which have an important effect on child welfare. We consider three such variables:

- labour supply, meaning the amount of time that different household members, including children, allocate to work activities;

- real income, meaning the household's purchasing power over market goods and services, and
- access to public services, meaning the quantity and quality of public services (e.g. health and education) which are available and can be afforded by the household.

The effects of these variables on child welfare (arrows a,b,c in Figure 1) are discussed in Section 3.
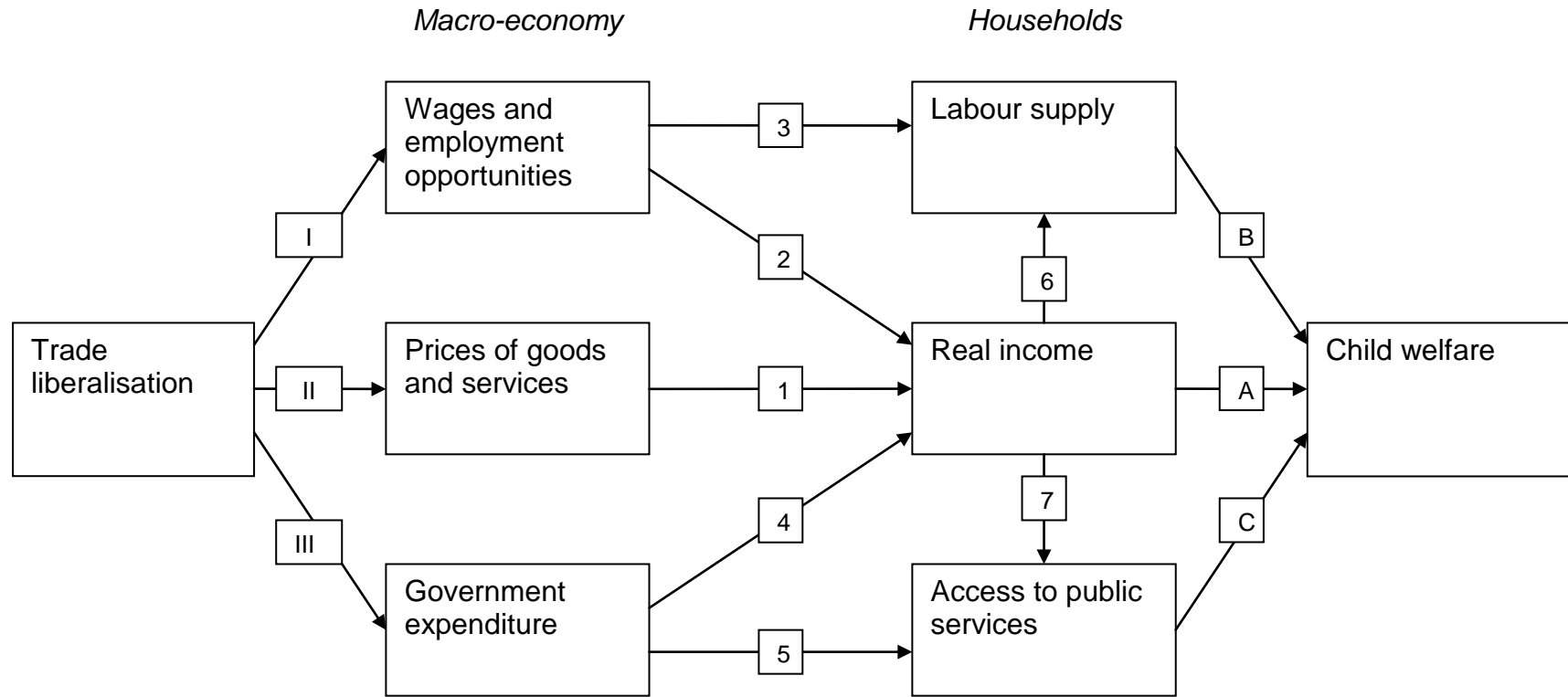
Moving one step further to the left, we have those macro-economic variables which have an important effect on the household. We consider three such variables:

- the domestic prices of goods and services;
- levels of wages and employment opportunities (by sector and/or skill-level), and
- the level and composition of government expenditure.

Several different methods and data sources can be used to describe and measure the effects of these variables on household (arrows 1-5 in Figure 1); these are discussed further in Section 4. Such methods need to take into account the effects of household real income on its labour supply and access to public services (arrows 6 and 7).

Finally, on the far left-hand side of Figure 1, we have trade liberalisation, the policy change motivating the research. By trade liberalisation we generally refer to reductions in the amount of barriers to the import and/or export of a particular commodity or group of commodities. These reductions may take various forms, including the lowering of import tariffs, quotas and export taxes, the removal of administrative barriers (e.g. import or export licences), and so on. Once again, various different methods and data sources can be used to describe and measure the effects of trade liberalisation on the key macro-economic variables affecting household (arrows I, II and III in Figure 1). These are discussed further in Section 5.

Figure 1

Macro-economy   *Households*

	Macro-economy	Households

Trade liberalisation → I → Wages and employment opportunities → 3 → Labour supply

Wages and employment opportunities → 2 → Real income

Trade liberalisation → II → Prices of goods and services → 1 → Real income

Trade liberalisation → III → Government expenditure → 4 → Real income

Government expenditure → 5 → Access to public services

Labour supply → 6 → Real income

Real income → 7 → Access to public services

Labour supply → B → Child welfare

Real income → A → Child welfare

Access to public services → C → Child welfare

Depending on the context, the liberalisation of trade in some commodities and sectors will have larger effects on children than others. The largest effects on poor children are likely to occur as a result of changes in import and/or export barriers for commodities which account for a significant share of the income or expenditure of the households in which they are based: food crops for example. Nevertheless, it is important to bear in mind that liberalisation in one sector can have far-reaching effects throughout the economy. Even when households are engaged in essentially non-traded activities – traditional agriculture, informal sector services – they can still be affected by trade liberalisation if the latter causes a large increase (or decrease) in the number of people looking for work in the non-traded sector.

Also depending on the context, some of the links (i.e. arrows) illustrated in Figure 1 will have larger effects on children than others. For instance, where barriers to imports or exports of an important food commodity (e.g. rice) are reduced, a particularly important link is from liberalisation to domestic food prices (link II), and from domestic food prices to household real income (link 1). Alternatively, when barriers to imports or exports of an important non-food commodity (e.g. coffee, textiles) are reduced, a particularly important link is from liberalisation to wages and employment opportunities (link I), and from wages and employment opportunities to household real income (links 4). It will not therefore always be necessary for research to analyse in detail each of the links illustrated in Figure 1, although awareness of the various different channels of impact is an advantage.

Inevitably, there are some channels through which trade liberalisation may affect child welfare which are not adequately reflected in Figure 1. One is the impact of liberalisation on long-run economic growth and technological change, while the other is the impact of liberalisation on the amount of risk and vulnerability experienced by households. Although several economic theories suggest these effects may be significant in practice, it is difficult to say much about their likely

size or direction in any one country context, without a large amount of additional research. By contrast, the links shown in Figure 1 are ones which we have a reasonable chance of measuring the size (or at least the direction) of in each country, given the resource constraints the researchers in each country faced.

3   Impacts of household-level variables on children

We start with the effects of changes in household-level variables on children. First, household real income affects children directly (link A) by affecting the quantity and nutritional content of the food which children eat, their access to medicines and their use of education materials (e.g. textbooks), and so on.

Second, household labour supply affects children (link B) directly when children are considered part of the household labour force and are required to work more when other household members work more. This may include work within the household on so-called 're-productive' tasks, as well as 'productive' work outside the household in formal or informal employment. Even if children are not expected to work, they may be affected directly by changes in the amount of care and attention they receive from adults, following changes in the amount of time that adults spend working (also included in link B).

Finally, access to public services (e.g. health and education) affects child welfare (link C). Public health and/or education facilities provide services and information (medicines, medical knowledge, literacy) which are important to children's well-being, and which cannot always be acquired through the private sector at the same cost and/or quality.

Each of the above effects is likely to vary in terms of size and importance across households. Where income is pooled and decision-making is joint, or where the household head is a 'benevolent dictator', households may shield the effects of income shocks on children, at least in the short-run. They can achieve this by

increasing the labour supply of adults, by reducing food consumption among adults, or by selling household assets. Households might also sequence such coping strategies, starting with those less likely to harm the crucial building blocks for future recovery and progressing to the more harmful (Corbett 1988, Swift 1993, Scoones 1995).

The extent to which adults will make sacrifices for their children will tend to vary, depending on things such as education, existing level of wealth, and the distribution of decision-making power within the household. Where culturally determined gender roles and norms result in separating out productive and reproductive tasks by gender, the production and sale of commercial crops (e.g. coffee and cotton) is often controlled by adult male members of the household. An aggregate increase in household income resulting from an increase in the price of such crops may only benefit the adult male members of the household. Whether additions to household income are distributed within the household in this way is generally determined by local cultural norms (for a recent review of the literature on intra-household decision-making see Bolt and Bird, 2003).

When it comes to documenting and/or measuring the effect of household-level variables on children, various sources of evidence are available. Household income and expenditure surveys (e.g. the World Bank Living Standards Measurement Surveys) typically contain some indicators of child welfare. One can therefore use such surveys to measure the correlation between household-level variables (e.g. income, assets) and child welfare indicators (see, for example, Psacharopoulos 1997, Patrinos and Psacharopoulos 1997). Where the same households are tracked and interviewed over time, one can go one step further and ask whether changes in household real income – caused by a drought, or a job loss for example – are associated with changes in child welfare indicators (e.g. Jalan and Ravallion 2001).

The Young Lives Surveys also provide relevant information. Section 8 (Economic Changes) identifies households which have experienced adverse economic shocks, including 'job loss/source of income' and 'decrease in food availability'. It also reports the types of responses by each household to the shock, including 'increase hours worked', 'sell assets', 'eat less', 'take children out of school', 'send children to work'. With this information, one can investigate the extent to which children have been adversely affected by the shock. This would be the case, for example, if households report either 'take children out of school' or 'send children to work' as one of their responses to a shock. One can also ask whether the proportion of households experiencing a shock and reporting responses of this kind varies, according to household characteristics such as the mother's level of education, the prior level of asset holdings, and so on.

Of course, this sort of evidence is far from conclusive. It gives little information about the source of any shock experienced by the household: in particular, whether it was in any sense caused by trade liberalisation. It also cannot capture some of the less obvious ways in which children might be affected by an adverse shock, such as a reduction in expenditure on education materials (e.g. textbooks) rather than being withdrawn completely from school. Further insights can be obtained from a more qualitative approach (e.g. the construction of community histories and community timelines, key event mapping, and focus group discussions).

4   Impacts of macro-level variables on households

We now turn to the effects of macro-level variables on households. Changes in the domestic price of a particular commodity affect households' real income (link 1), depending on the extent to which that commodity is produced and/or consumed by the household. Consider, for example, a rise in the domestic price of rice as a result of the removal of export restrictions. Households which

consume a lot of rice but produce little rice themselves (e.g. manufacturing-sector workers in urban areas, or poor rural households with marginal land holdings or limited labour) will tend to feel worse off as a result. By contrast, households which consume rice but produce a greater amount (e.g. surplus producing small-holder farmers in rural areas) will tend to feel better off as a result of the price increase.

A general formula for assessing the effects of price changes on household real income, which has been used in the previous literature (e.g. Deaton 1997, McCulloch 2003) is:

Change in real income = change in price of the good x (share of household income spent on the good – share of household income derived from producing the good).   (1)

In other words, where a product accounts for a smaller share of household expenditure than the share of household income produced through its sale (or use in-kind), a rise in its price will increase household real income, and a fall in its price will rise will reduce household real income. When a product accounts for a larger share of expenditure than income, changes in its price have the opposite effect. Where there are changes in several products, the overall effect on household consumption can be obtained by calculating the formula separately for each product and then adding up the results.

Households can of course substitute their consumption away from goods which have risen in price, and their production away from goods which have fallen in price. This means that they can mitigate/offset the negative impact of price changes, and reinforce any positive impacts. The extent to which this is possible however will depend on characteristics both of households (e.g. their access to credit, seeds and technical cultivation knowledge) and of the goods which have

changed in price (e.g. availability of substitutes, cultural importance of the good).

Changes in wages and/or employment opportunities also affect household real income (link 2). In the short-run, these effects vary according to the share of earnings from employment from a particular sector (e.g. textiles, food processing) or a particular type of labour (e.g. unskilled, semi-skilled) in total household income. This can be represented by the following formulae:

> Change in real income = change in wages/employment opportunities in sector x (share of household income derived from employment in that sector), or   (2)

> Change in real income = change in wages/employment opportunities for skill type x (share of household income derived from employment by that skill type).   (3)

Where there are changes in several categories of labour, the overall effect on household consumption can be obtained by calculating the formula separately for each category and then adding up the results.

In the medium-run, household members can in many cases re-locate from sectors in which wages and/or employment has fallen, and towards those in which they have risen. In this case, they can (as with substitution in consumption) mitigate the negative impact of wage changes, and reinforce any positive impacts. The extent to which this is possible will again depend on characteristics both of household members (e.g. their ability to move geographically) and those of the expanding and declining sectors (e.g. the transferability of skills between them).

Nevertheless, moving between sectors is generally more achievable than moving between skill types, the latter requiring a significant and potentially prohibitive amount of re-training. The effects of changes in wages and/or employment opportunities for skill types are therefore much more likely to persist over time. In addition, a re-allocation of labour time by the household in response to a change at the macro-economic level might often imply a reduction in agricultural production for home consumption. This can have an adverse effect on household food security, particularly where the distribution of income within the household is skewed toward certain members, and/or where poorly functioning local food markets mean that effective demand is not always met by reliable supply. Note also that women and children may not be free to make independent decisions about the allocation of their labour (or leisure).

Changes in wage and/or employment opportunities also affect the total amount of time households supply in the labour market. Here there are two effects to consider. The first (link 3) is a direct effect. Holding other things constant, we expect that household members faced by a rise in wages to increase the amount of time supplied in the market, thus reducing the amount of time they spend on household tasks and in leisure. Similarly, we expect that household members faced by a fall in wages to reduce the amount of time supplied, thus increasing the amount of time spent on household tasks and in leisure.

The second is an indirect effect, which occurs via the effect of changes in wages and/or employment opportunities on household real income (link 2), and the effect of changes in real income on labour supply (link 6). We expect that as households become richer they reduce the amount of time allocated to work activities, particularly that by children.[1] It is often argued, for instance, that families only send children to the labour market because their income is very low (e.g. Basu and Van 1998).

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[1] In more technical language, the direct effect is the 'substitution' effect of a wage change, while the indirect effect is the 'income' effect.

Changes in government expenditure affect household real income (link 4) through their effect on the amount of transfers (e.g. pensions, food for work schemes, conditional cash payments) which households receive, and on the extent of subsidies they receive for certain consumption goods (e.g. food, fuel). Households which receive significant levels of state benefits (e.g. the old age, or those with disabilities) will have to reduce consumption as a result, although this may be offset by increased voluntary transfers from friends and family. They also affect households' access to public services such as health and education (link 5), by affecting either the quality of service provided or the level of subsidy. To the extent that school attendance or hospital visits involve additional expenses which must be paid for by the household (e.g. travel, uniforms), effective access to public services also depends on household real income (link 7).

Turning now to measuring the effect of macro-level variables on households, a variety of different methods and sources of evidence are available. Much work has been done at the World Bank and elsewhere estimating the effects of price changes on households, particularly those caused by the liberalisation of trade (e.g. Deaton 1997, McCulloch et al. 2001, McCulloch 2003). Several recent empirical studies are reviewed by Winters et al. (2004).

The basic approach is to calculate the shares of household income accounted for by different commodities for different groups of households from household income and expenditure surveys (e.g. World Bank Living Standards Measurement Surveys). This information can then be used to estimate the effect on real income of a change in the price of any one particular commodity using Equation (1) above. These calculations are done on a disaggregated basis, as income and expenditure shares – and therefore the effect of price changes –

typically differ significantly between groups of households with different income levels, type of livelihood activity, and in different regions (e.g. rural vs. urban).[2]

Household surveys typically also contain information on the share of household income derived from employment in different economic sectors and according to the education level of household members (education being a proxy for skill level). This information can be used to estimate the effects of changes in wage and/or employment opportunities on household real income in the short-run, using Equation (2) or (3) above. Such calculations also need to be done on a disaggregated basis across households.

Household surveys also contain information on (or allow calculation of) the receipt of government transfers and net subsidies by households, which can be used to estimate the effect of changes in government spending on household real income. Much recent work has been done at the World Bank and elsewhere measuring the amount of public expenditure which is in fact received (directly or in-kind) by different groups of households (e.g. van de Walle 1998, World Bank 2004).

It is more difficult to obtain information on the various elasticities in household production and consumption decisions. These include the elasticity of household labour supply to wages and real income (links 3 and 6), and the elasticity of household use of public services to government spending and real income (links 5 and 7). They also include the various elasticities of substitution between different consumer goods in response to price changes, and the elasticities of labour re-allocation between sectors in response to changes in wages and/or employment opportunities, which determine the magnitude of links 1 and 2 in Figure 1.

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[2]   The most common disaggregation is by the real income or consumption level of the household, and involves dividing a given sample of households into teen equal sized groups called deciles.

Given sufficient time and data availability, estimates of these various elasticities can be obtained from the econometric analysis of household survey data. In the absence of – or ideally, in addition to – such estimates, much can also be said through a good understanding of household decision-making patterns and socially determined gender roles within the household obtained through more qualitative research instruments, including community histories, focus group discussions and semi-structured interviews.

5   Effects of trade liberalisation on macro-level variables

Finally, we turn to the effects of trade liberalisation on domestic prices, wages and employment opportunities, and government spending. We begin first with a brief discussion of what is meant by trade liberalisation. In Section 2, we defined liberalisation as reductions in the amount of barriers to the import and/or export of a particular commodity or group of commodities. These could take the form a reduction of import tariffs or quotas, a reduction in export taxes, or a reduction in administrative barriers to imports or exports. In most cases, the effect of liberalisation so defined will be to increase the profitability of production for export and/or reduce the profitability of import-competing production for the home market.[3]

Although households and children are perhaps most likely to be affected by trade liberalisation in their own country, they may also be affected by liberalisation in their trade partners or, indeed, in changes in the preferential access offered to products from their country in important external markets (e.g. the EU or US). A notable example of the impact of liberalisation by trade partners was the shift to export-oriented trade strategies of several developing

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[3]   In some cases, liberalisation could in fact reduce the returns to production for export – as, for example, when it involves the removal of export subsidies. However, our chief concern is with liberalisation measures which increase the profitability of exporting and/or reduce the profitability of production for the domestic market.

countries between the 1960s and 1980s, which reduced the wages and increased the unemployment rates of less-skilled workers in developed countries (Wood 1994).

Trade reforms in one small country are unlikely to have much impact elsewhere, but those in a large country (e.g. China or India) are, through their effect on world prices. For example, because China is such a large country, the liberalisation of its trade has reduced the world price of goods which it exports (e.g. textiles), and increased the world price of goods which it imports (e.g. oil, raw materials). These changes in world prices in turn affect domestic prices in other countries which are open to trade, and the effects of these changes (on households and children) can be analysed in exactly the same way as if it they been caused by a change in domestic trade policy.

Turning to the effects of trade liberalisation on macro-level variables, the starting point is its effect on domestic prices (link I in Figure 1). The simplest case to consider is that of a small country with an ad valorum tariff (t) on all imports. In this case, the 'border' price of imports (p_M) is given by:

$$p_M = p*(1+t) \quad , \qquad\qquad\qquad (4)$$

where p* is the world price of imports (in domestic currency). A reduction in the tariff to t_1 leaves the world price p* unaffected (because the country is small), so the proportional change in the 'border' price of imports can be calculated as:

$$\frac{p_{M1} - p_M}{p_M} = \frac{t_1 - t}{1+t} . \qquad\qquad\qquad (5)$$

Under these assumptions, the effects of other trade reforms on import prices can be analysed in the same way. (In the case of the removal of import quotas,

one must first calculate the reduction in the tariff-equivalent of these quotas).
Another simple case is a small country with an ad valorum tax (s) on all exports.
In this case, the border price of exports (p_x) is given by:

$$p_X = p*(1-s) \quad ,$$ (6)

and the proportional change in this price in response to a reduction in the tax to
s_1 can be calculated as:

$$\frac{p_{X1} - p_X}{p_X} = \frac{s - s_1}{1 - s}.$$ (7)

Given information on the types of trade reforms implemented or to be
implemented in any one context, one can use equations (5) and (7) to estimate
the size of the effect of trade reforms on domestic prices 'at the border' – i.e.
without allowing for the effects of internal transport costs. Information on
current and reformed tariff schedules is typically provided by national ministries
of trade or commerce, or alternatively can be obtained from multilateral agency
sources (e.g. UNCTAD). For reductions in import quotas however, the
estimated reduction in the tariff-equivalent of the quotas must be calculated.

The effects become more complicated when we allow for the fact that not all
price changes at the border are transmitted to different regions within a country.
The potential impacts of trade policy changes depend crucially upon local
markets receiving price signals, which in turn depends on the characteristics of
those markets including their very existence. The existing literature has identified
are at least six groups of factors affecting price transmission:

- Transport and transactions costs can produce price differentials between
  locations. Including these costs in the analysis is simple if they can be
  assumed to be proportional to traded quantities rather than fixed (see,

for example, McNew, 1996 and Barrett and Li, 2002). However, calculating differential transport and transactions costs for a range of tradable goods is, in reality, complex, as costs along certain routes may be lower than along others. Certain routes may offer choice between road and rail, other routes may offer only road transport, and other still may require transhipment to water transport as road quality deteriorates.

- Market power. Depending on the degree of competition and economies of scale in a particular market, some producers may be able to exert monopolistic or monopsonistic power. Price increases may be passed on to consumers while price decreases may be captured by the segments of the industry (Wohlgenant, 1999).

- Exchange rates. Where large fluctuations in the real exchange rate occur (especially where official exchange rates stay fixed for a number of years), domestic pricing may be determined more by reference to the price of other products rather than by reference to the world price converted at the official exchange rate.

- Trade policies. Non-tariff barriers e.g. quotas and technical restrictions, and variable/prohibitive tariffs have strong effects on price transmission. In contrast, ad valorem tariffs behave like proportional transaction costs.

- National price stabilisation policies. National authorities may pursue a conscious policy of stabilising domestic prices in the face of fluctuating world prices and/or supporting domestic prices in the face of falling world prices. Inefficient or politically influenced national authorities (generally, but not exclusively, pre-liberalisation parastatals) have sometimes set domestic prices that do not reflect world market conditions.

Previous studies have found that price transmission in African countries is generally lower compared to that of other regions. Physical barriers, poor

infrastructure (including telecommunications), and remote and limited domestic markets are the main explanations. Among other regions, price transmission is highest for Asian countries while the picture is more mixed for Latin America. It has also been shown that price transmission is more complete in some markets (e.g. cereals, oilseed) than for others (e.g. livestock).

Sources of evidence on regional price variations include information from household surveys and national statistics (e.g. Ministry of Agriculture), although such sources can underestimate price variation seasonally and by distance. However, nationally available price data can be adjusted using information from national and regional traders, and through inferences made by researchers about price transmission through a review of existing literature on the quality of infrastructure and on the existence of state marketing organisations.

Trade liberalisation typically also has important effects on wages and/or employment opportunities (link II in Figure 1). A useful distinction can be made between the 'trade' and 'development' approaches to considering these effects (McCulloch et al. 2001). According to the trade approach, wages are assumed to be flexible – adjusting according to changes in the supply of and demand for different types of workers – and workers are assumed to be free to move between different sectors should they so wish. Under these assumptions, the effects of trade liberalisation on wages are those predicted by the Stolper-Samuelson theorem. This states that a rise in the relative price of exports will increase the real wages of those types of labour which are used intensively in export sectors, and reduce the real wages of those types which are used intensively in import-competing sectors. In many developing countries, the type of labour used most intensively in export sectors is unskilled labour – workers with some basic education but little beyond primary school.

The predicted effects are slightly different when workers are assumed not mobile across sectors which is often more plausible in the short-term. In this case, a rise

in the relative price of exportable goods will increase the real wages of those workers based in exporting sectors, and reduce those of workers base in import-competing sectors. Despite this, full employment in each sector and for each type of labour can still be maintained if real wages within each sector are sufficiently flexible.

The 'development' approach, by contrast, does not assume flexible wage setting. It assumes instead that wages in the formal sector are set by governments and trade unions above levels prevailing in the informal sector. In this case, a rise in the demand for labour in the formal sector may have little effect on average wage levels more widely, because additional workers can be withdrawn from the informal sector at the existing wage. In this case, increases in labour demand impact households not by increasing wages, but by increasing opportunities for employment, at the higher wage level, in the formal sector. The extent to which these opportunities are taken up may still be limited, however. Various barriers to mobility from the informal to the formal sector exist, including poorly functioning food markets determining a high degree of preference for agricultural production for own consumption, limited financial services markets, low capabilities, information asymmetries, barriers to geographical mobility, and non-meritocratic recruitment practices.

To find out the extent to which trade liberalisation has affected or is likely to affect wages and employment opportunities in practice, the first task is to look at the characteristics of firms and workers in the main importing sectors and exporting sectors of the economy. This requires looking at the labour intensity of each sector (employment per $m of output), and the distribution of employment in each sector by gender, skill-level (e.g. level of education) and region. This type of information may be available from National Statistical Offices or from Household Surveys. Care will need to be taken to capture, where possible information about people involved in the   sector, including on-

farm, off-farm and non-farm rural enterprises. Such information may be available from livelihood surveys, where they have been completed.

If export sectors use certain types of labour significantly much more intensively than import sectors, we would expect trade liberalisation to raise wages and/or employment levels for those types of labour. By contrast, if export sectors use certain types of labour significantly much less intensively than import sectors, we would expect trade liberalisation to reduce wages and/or employment levels for those types of labour. One can use the 'factor content of trade' (FCT) method to provide quantitative estimates of these effects (see, for example, Wood 1994). This involves calculating the amount of labour of different skill levels 'embodied' in traded goods and services. This is calculated as follows. First, the labour of each skill level used to produce a country's exports is estimated as:

$$z_x = Ax \quad , \tag{8}$$

where A is a (q x r) matrix specifying the quantity of each of the q skill categories used per million dollars of output in each of the r sectors of the economy, x is a (r x 1) vector of sectoral shares of total exports (which sum to unity), and z_x is a (q x 1) vector showing the amount of labour of each skill level used per million dollars of exports. Second, the amount of labour of each skill level which would be required to produce (domestically) a country's imports is estimated as:

$$z_m = Am \tag{9}$$

where m is an (r x 1) vector of sectoral shares of total imports, and z_m is a (q x 1) vector showing the amount of labour of each skill level which would be required to produce each million dollars of imports. The impact of trade on the demand for labour of each skill type is then estimated as:

$$Z = X(z_x - z_m) \tag{10}$$

where Z is a (q x 1) vector of labour quantities and X is the total value of a country's exports (or imports). The sign of the impact of trade on the demand for labour of any one skill level depends on whether the relevant row of z_x is greater or smaller than the corresponding row in z_n; the size of the impacts depend on the difference between each of the rows in z_x and z_n, and on the total volume of exports.

For reforms which have already been implemented, one can compare the predicted effects of trade on labour demand with information on actual trends in wages and employment opportunities before and after the reforms, and observe the extent to which the size of actual trends can be accounted for by the predicted effects.

Finally, where trade liberalisation involves the reduction of trade tariffs and taxes, it may affect government revenue and therefore expenditure (Link III). This is of course most likely to be important where revenues from import tariffs and export taxes are an important source of government revenue. Even so, there is no reason to expect that a reduction in tariffs will necessarily reduce government revenues, even if they have accounted for a large share of revenues in the past (Khattry 2003). A reduction but not a complete phasing-out of tariffs could conceivably increase revenues if it leads to a large increase in the volume of imports for example.

More generally, governments have alternative means of raising revenues, including indirect (e.g. sales taxes) and direct (e.g. income taxes) domestic taxation. Moreover, governments can also re-allocate the composition of expenditure so that certain key sectors (e.g. education) are shielded from an aggregate reduction in expenditure. Nevertheless, there may well be instances in which governments are not able to re-allocate expenditures or raise revenues from alternative sources, at least in the short to medium term, and expenditure may have to fall.

Finding out how trade reforms have affected, or are likely to affect, government expenditure requires in the first instance information on the contribution of trade tariffs and taxes to total tax revenue. Such information is typically availale from National Statistical Offices, or from international agency sources (e.g. IMF). One can then estimate the likely changes in revenues resulting from the proposed trade reforms, under alternative scenarios. McCulloch et al. (2001: 130) propose the use of two such scenarios: a 'worst-case' scenario, in which current trade volumes remain the same and only tariff rates change; and a 'realistic' scenario, which takes into account potential increases in imports due to falling restrictions.

Information is also required on the allocation of government expenditure across different activities. If total government revenues change as a result of liberalisation, one can predict the likely change in each component of public expenditure, given some assumption about the likely change in the share of each component in total expenditure (likely to be affected by previous government commitments, domestic politics and, where relevant, donor influence).

6	Summary

To summarise, this section has outlined a framework for analysing and, where possible, measuring the various channels through which a macro-level policy change, such as trade liberalisation, affects children. Three sets of relationships have been discussed: the effects of changes in household labour supply, real income and access to public services on the welfare of children; the effects of changes in prices, wages and employment opportunities and government expenditure on households; and the effects of trade liberalisation on prices, wages and employment opportunities and government expenditure. By gathering information and carrying out analysis on each set of relationships, one can build up an overall picture of how any given trade reform or set or reforms impacts on children. This picture can be quite disaggregated, at the level both

of households (e.g. rural vs. urban, rich vs. poor) and children (e.g. boys vs. girls).

We end by comparing the approach outlined in this section with other possible approaches. One alternative would be to construct a formal computable general equilibrium (CGE) model of the country in which the impact of liberalisation is being measured. This would essentially involve attaching specific numbers and functional forms to the various linkages between variables shown in Figure 1 and discussed in the previous sections. Such an approach could, at least in theory, generate quantitative and not just qualitative predictions of the impact of liberalisation on children, which take into account the effects of spillovers and linkages between different sectors an commodities within the economy. A recent example of this approach, looking at the impact of trade liberalisation on women, is Fontana and Wood (2000).

Another alternative would be to rely less on the modelling of the various transmission mechanisms from trade reforms to child welfare, and more on the statistical analysis of observed child welfare indicators before and after trade reforms have been introduced.[4] A recent example of this approach is Edmonds and Pavcnik (2002), who analyse changes in the amount of child labour in Vietnam between 1993 and 1998 (a period of substantial trade liberalisation). They do not measure the effects of trade liberalisation on the amount of child labour directly; they instead measure the effects of changes in the domestic price of rice on the amount of child labour (via links 2,3 and 6 in Figure 1), and then estimate separately the contribution of trade liberalisation to observed changes in the domestic price of rice (link II in Figure 1).

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[4] Assume, for instance, there exist two household surveys, one which pre-dates liberalisation and one which post-dates it, that the same households are interviewed in each case, and that they include information on some widely-accepted measures of child welfare (e.g. under 5 mortality, stunting and wasting, time spent in school). One could then calculate the amount by which different groups of children became better or worse off following the liberalisation, and the extent to which these is varied according to the characteristics either of children themselves or of the households in which they live.

A final alternative would be to take a more qualitative approach, combining participative methods (e.g. the construction of community histories and community timelines, key event mapping, wealth ranking) with sub-sectoral analysis (to trace the impact of liberalisation on different actors in a given sub-sector and identify changes in the up and downstream supply chain), focus group discussions and in-depth socio-economic analysis (including the in-depth interviewing to enable the modelling of local household decision-making norms and the application of social analysis tools to enable gender-based daily time budgeting). Such approaches are powerful at unpicking processes and determining why a given chain of events results in differential outcomes for different households and individuals.

Given greater availability of time and resources, further work on the impacts of trade liberalisation on children could involve going beyond the approach outlined here, and towards one of these three approaches. Each have their advantages and disadvantages, meaning that a combination of all three would be best.

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