Industrialisation after a Deep Economic Crisis: Indonesia

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Final version received June 2009

ABSTRACT *Indonesia experienced a deep economic contraction as a result of the 1997–1998 Asian crisis. This paper develops an analytical framework that facilitates an examination of trends and patterns in the country's industrial sector in the wake of the crisis, and explains why it appears to be on a lower growth trajectory. We particularly focus on why industrialisation has become less employment elastic; why industrial exports have performed indifferently; and why the process of small firms 'graduating' to larger units has slowed, and most of the output growth is now coming from existing firms rather than new entrants.*

I. Introduction

What happens to the industrial sector and patterns of industrialisation after a deep economic crisis? As with the effect of liberalisation on industrialisation (AswicaHyono et al., 1996), both theory and the empirical literature provide some, albeit limited, guidance. There is a large literature on crises, their origins, effects, and recovery trajectories. This literature emphasises both the common elements – a sharp decline in economic activity, combined with financial and exchange rate collapses – as well as the role of country-specific factors. Appropriately, the main focus is on economy-wide features of the crisis and its impacts, and therefore much less is known about sector-specific dimensions. These may vary for a number of reasons. First, relative prices change as a result of exchange rate movements, and thus the degree of 'tradability' of the sector will be a factor. Second, ownership patterns vary across sectors, for both policy and industrial organisation reasons, and these too typically change as a result of a crisis. Third, the policy regime often changes significantly as a result of a crisis, and here too there may be sector-specific impacts.

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This paper examines this question with reference to a detailed study of Indonesian industrialisation after the 1997–1998 economic crisis. Indonesia is well suited to such a study. It experienced a deep economic crisis in 1997–1998, with the economy contracting by almost 14 per cent. Beginning in 2000, it then began to recover, and income per capita now exceeds pre-crisis levels. It is now a decade since the crisis so trends may be clearly identified. A key argument is that, while the general, macroeconomic policy settings have remained broadly similar, at the microeconomic level the changes have been more substantial. Inevitably the story is in part *sui generis*, but we argue that in this respect Indonesia shares several common features with other post-crisis developing economies, and that therefore the results of our study are of wider analytical and policy interest. Indonesia has the additional attraction, crucially important for studies of this genre, that its industrial data base is among the most comprehensive in the developing world, and it is possible to trace firm-level dynamics over time.

By way of background, Section II briefly reviews Indonesian industrialisation, pre and post-crisis, surveys the main features of the 1997–1998 economic crisis and the subsequent recovery, and highlights key aspects of the post-crisis policy environment. It also distills lessons from the literature on the effects of economic crises. Section III, the major part of the paper, examines post-crisis industrial growth and structure, export and employment performance, and firm-level dynamics. The concluding section summarises the main arguments and draws out some broader implications.

II. Indonesian Economic Development and Economic Crises

Indonesia: Rapid Industrialisation, 1966–1996 and Deep Crisis, 1997–1999

In the mid-1960s, Indonesia had barely commenced the process of modern industrialisation. No foreign capital was present, and the ‘commanding heights’ of the economy were in state hands. With the regime change in 1966, the country then experienced very rapid industrial growth and structural change through to 1997 (Hill, 1997). Annual industrial growth was at least 9 per cent in all but two of the 27 years, 1970–1996. Foreign investment returned from the late 1960s in response to the newly liberal policy regime and generous fiscal incentives. Initially, catch-up and import substitution were the principal drivers of growth. From the mid 1980s, labour-intensive exports became a significant engine of growth. Accompanying this growth was rapid structural change, as the industrial sector evolved from the production of simple consumer goods and basic resource processing to a wide range of manufactures of increasing technological sophistication. Indonesia’s emergence as a significant industrial exporter from the mid 1980s was the result of a highly successful reform programme involving the lowering of protection, a more open foreign investment regime, and simplified trade procedures, combined with effective macroeconomic and exchange rate management (Aswicahyono et al., 1996).

Indonesia then experienced a deep economic crisis in 1997–1998, the most serious in East Asia. Triggered initially by the collapse of the Thai Baht, Indonesia began to experience large-scale capital flight in the second half of 1997, resulting in a sharp

depreciation of the Rupiah and deep financial distress. At the peak of the crisis, the dollar exchange rate had fallen from Rp2500 to Rp17,500, and credit in the modern financial sector had effectively dried up. In the first half of 1998, there was a loss of macroeconomic control, as inflation on an annualised basis exceeded 100 per cent. The economy contracted sharply from late 1997, by over 13 per cent in 1998. The economic crisis in turn precipitated a political crisis, culminating in May 1998 in the end of the 32-year authoritarian Soeharto regime. Investment, both domestic and foreign, also collapsed. In the six years prior to the crisis, net annual foreign direct investment (FDI) inflows averaged \$2.7 billion, whereas there were net annual outflows of \$1.4 billion for the five years after the crisis. As a result of these 'twin crises', Indonesia also recovered more slowly than its East Asian neighbours (World Bank, 2000). For the period 2000–2005, growth averaged 4.5 per cent, in contrast to the 7.3 per cent recorded in the pre-crisis period 1990–1996. Table 1 records this sharp turnaround by sector over the period 1990–2006. The slowdown in manufacturing has been more pronounced, with output since 2000 growing at a little over half the pre-crisis rate. Thus, manufacturing has slipped from being a leading sector, to a growth rate at about the economy-wide average.

Indonesia's Post-Crisis Policy Framework

There are both continuities and changes in Indonesia's post-crisis commercial policy environment. Five general features are relevant as a backdrop to the subsequent analysis. First, as noted, the exchange rate collapsed, and there was also a temporary loss of macroeconomic stability in 1998. With the restoration of political and macroeconomic stability in 2004, the rate stabilised somewhat, generally within the range Rp9000–10,000 to the US\$, until the current global economic crisis.¹ Thus, the very large nominal depreciation translated into a large real effective depreciation, but one that was of quite brief duration owing to the high inflation. From around 2000, Indonesia's real effective exchange rate has been largely similar to that of its East Asian competitors.

Table 1. GDP growth by sector (% per annum), 1993–2006

	1990– 1993	1994– 1996	1997– 1999	2000– 2002	2003– 2006
Tradeable	6.3	6.5	–2.8	4.2	3.6
Agriculture	3.1	2.8	0.7	2.9	3.1
Mining & Quarrying	4.3	4.6	–0.9	2.0	–0.1
Manufacturing	10.4	9.5	–5.1	5.9	5.2
Non-Tradeable	7.9	8.4	–5.5	5.1	3.6
Electricity, Gas & Water Supply	13.7	15.1	7.3	8.4	5.6
Construction	11.9	13.5	–10.3	5.2	7.5
Trade, Hotel & Restaurant	7.1	7.8	–4.2	4.6	6.4
Transport & Communication	9.3	8.9	–3.1	8.5	13.0
Financial	13.3	9.6	–10.9	6.1	6.7
Services	4.4	3.9	0.7	3.2	5.3
GDP	7.0	7.4	–4.1	4.6	5.2

Source: CEIC Database.

Second, with regard to trade policy, Indonesia was a broadly open economy at the time of the crisis: average levels of import protection had declined since the major 1980s reforms, and most sectors received quite low protection, except where politically influential lobby groups and individuals were able to resist the liberalisation. There was further liberalisation in 1997–1998 as part of the Letter of Intent with the IMF, and in general the country has not turned inward since exiting the programme in late 2003.²

Third, FDI flows to Indonesia have lagged significantly behind practically all major East Asian economies since 1997. Indonesia was the only crisis-affected economy to register negative FDI flows for several years after the onset of the crisis. The comparison with Thailand, where ‘fire-sale’ FDI was significant in the wake of the crisis, is particularly pronounced (see Ramstetter and Sjöholm, 2006). Moreover, the foreign investment approvals data, which are not comparable to the balance of payments estimates of realised flows, shed light on the changing nature of FDI after the crisis. In addition to much reduced investor interest, the proportion of FDI taking the form of greenfield investment has declined, with both expansions and mergers and acquisitions (M&As) rising.³ This is consistent with the theory of post-crisis, ‘fire-sale’ FDI behaviour more generally (Lipsey, 2001): there is excess capacity, and asset prices fall sharply owing to the effects of the exchange rate depreciation and the crisis.

Fourth, there have been major changes in Indonesia’s labour market policies in the wake of the crisis. During the Soeharto era, labour market outcomes more or less accorded with ‘East Asian norms’. Rapid economic growth generated rising real wages, with a lag. Trade unions existed, but were heavily managed. Minimum wages were prescribed but they were generally below market levels in the formal sector, and were not enforced systematically. During the crisis, real wages fell sharply, but unemployment rose only modestly (Manning, 2000). After the crisis, powerful pro-labour pressures emerged. The constraints on trade unions were largely removed. Under successive Ministers of Manpower, the government strongly supported worker entitlements and wage claims. The regulated minimum wage series increased by over 90 per cent in the three years 1999–2002. The regulatory environment has also introduced rigidities into hiring processes that discourage firms from taking on additional labour, with the result that Indonesia’s labour policies have become among the most restrictive in Asia (Manning and Roesad, 2006).

Fifth, several other aspects of the business environment have changed as a result of the crisis and its aftermath.⁴ Indonesia’s business regulatory regime continues to be complex, opaque and costly. The World Bank’s 2008 *Doing Business Survey* ranks Indonesia 123rd out of 178 economies for ease of doing business, with particularly poor rankings in categories dealing with licences, employing workers, enforcing contracts, and closing a business. While corruption has always been a serious problem, under the Soeharto regime the process and outcomes were largely predictable, whereas in the new environment, the links between bribes and ‘outcomes’ are much weaker and more uncertain. The financial sector has also experienced major changes. Financial health has been restored as the major financial institutions were rescued, merged or shut down after the crisis. However financial institutions are now considerably more prudent and cautious, particularly towards SME borrowers with limited or ill-defined collateral.

The Impact of Economic Crises

The literature on the effects on economic crises is as diverse and heterogeneous as the phenomenon itself (see World Bank (2008) for a recent survey). Crises vary as to their origins, intensity, magnitude, and duration. They range from mild economic contractions followed by swift recovery to deep, systemic events that permanently alter a country's development trajectory. Some crises principally affect the level of economic activity, while others are associated with – and maybe triggered by – widespread financial collapse and a sharp depreciation of the exchange rate. They may also be associated with – or again triggered by – broad and deep political and institutional changes. Recovery paths also vary greatly, from the 'V-shaped' swift return to pre-crisis growth rates, as in Mexico in 1994 and most of East Asia in 1999 (Corden, 2007; Ito, 2007), to the 'L-shaped' pattern of prolonged decline and stagnation, as in most of the economies of Eastern Europe and the former Soviet Union from the early 1990s (Pomfret, 2002).

This literature also highlights the fact that the effects of crises are more likely to be mild if several of the following factors are present: sound macroeconomic management in the period immediately prior to the crisis; a buoyant international economy, and with it the prospect of export-led recovery; a resilient domestic financial sector, that enables firms to trade through the crisis, and take advantage of the boost to competitiveness from the depreciating exchange rate; swift and constructive responses from international financial institutions, underpinned by coordinated support programmes from the world's major economies; domestic institutional capacity to respond to the corporate and personal distress caused by the crisis; and a strong and effective government able to respond quickly and decisively.

The weaker these factors, the more likely the effects of the crisis will be deeper and prolonged. This is especially the case in developing countries, where institutions are typically less well developed, conflict is widespread, the capacity for counter-cyclical macroeconomic policy more limited, governments are weaker and may lack legitimacy, and outcomes are sometimes significantly shaped by unpredictable interventions of the international donor community (Collier, 2007). Such a scenario is typical of many developing country crises, including the focus of this study, Indonesia.

In these cases, the literature provides at least some guidance on likely outcomes. These may be developed as hypotheses with specific reference to our case study of Indonesia's industrial sector, which we examine in the next section of the paper.

First, a sharp exchange rate depreciation will, *ceteris paribus*, provide a boost to competitiveness, translating into improved export performance and an increased share of tradables activities. Of course, the *ceteris paribus* caveat is critical, and it could be nullified by a range of other factors (Krugman, 2001). These include a loss of macroeconomic control, resulting in high inflation and therefore a real effective appreciation of the exchange rate; similar exchange rate movements among export competitor countries; and disruption of production activities owing to factors as diverse as conflict and policy uncertainty.

Second, the state of the finance sector is crucial to economic recovery. If, as frequently occurs, the crisis is accompanied by financial collapse, the beneficial effects of exchange rate movements may be nullified (Glick et al., 2001). There may

also be macroeconomic consequences if a major government-funded rescue programme is necessary. More generally, crises typically result in a fundamental behavioural change in the financial sector, towards prudence, caution and risk aversion. The latter may have implications for innovation, newcomers, and projects with long or uncertain gestation periods (for example, infrastructure and mining investments respectively), thus slowing economic growth and industrial dynamism.

Third, it is difficult to develop hypotheses concerning political and institutional developments in the wake of an economic crisis (MacIntyre, 2003). But, as a general proposition, the greater the uncertainty created by a crisis the more likely investors will hold back, or at least exhibit a preference for quick-yielding, liquid projects. The 'revolving door' so often observed after crises inevitably results in shorter time horizons and heavy discount rates attached to a regime's policy credibility. Corruption and patronage networks may also break down, further exacerbating the uncertainty.

Fourth, crises generally cause increased social distress, the more so as developing country governments generally lack the capacity to institute comprehensive social protection measures. This has particular implications for labour market policies, owing to the confluence of a set of political economy factors (see Edwards and Lustig (1997) in the Latin American context). Populist democratic regimes are a frequent result of crises. Rescue packages typically concentrate on key macroeconomic variables, with the result that the regime's economics expertise is concentrated in these policy areas. By contrast, labour portfolios are more commonly assigned to labour activists who, building a constituency and responding to the decline in living standards, introduce labour market policies that, while avowedly pro-labour, often discourage employment growth. Hence, employment outcomes may be disappointing and delay the broad-based recovery in living standards.

III. Indonesian Industrialisation since the Crisis

We now link the general predictions of crisis analytics and the specific developments in Indonesia during and immediately after the crisis to a range of industrial sector attributes and outcomes. In particular, we expect that there may have been a temporary improvement in export performance owing to exchange rate movements, but that it would be constrained by tighter labour market regulation, difficulties accessing finance, and a more uncertain business environment. Labour market outcomes are likely to be mixed, also owing to the less employment-friendly regulatory environment. The implosion of the formal financial sector and its subsequent cautious resurrection, combined with a less predictable business climate, may be expected to hinder firm mobility and dynamics. Foreign investment outcomes, and concentration more generally, are indeterminate, with the attraction of greatly cheapened asset prices counter-balanced by increased business uncertainty.

An Overview

There has been considerable inter-industry variation in growth rates both before and especially after the crisis (Table 2).⁵ Food processing and related products (International Standard Industrial Classification (ISIC) 31) is the only manufacturing sector not to record negative growth during the crisis. This reflects both the

Table 2. Industrial growth by sector (real value added, % per annum), 1994–2006

ISIC	Sector	1994– 1996	1997– 1999	2000– 2002	2003– 2006
31	Food, beverages, and tobacco	17.5	5.6	1.6	3.5
32	Textile, clothes and leather industry	8.7	–3.4	4.9	3.2
33	Wood and wood products	4.0	–14.0	2.7	–0.6
34	Paper and paper products	11.4	2.2	1.0	5.1
35	Chemicals and chemical products	10.7	–0.8	4.1	8.2
36	Non metallic mineral products	16.9	–7.0	10.4	5.2
37	Basic metal industries	11.1	–9.2	3.6	–2.4
38	Fabricated metal, machinery, and equip.	7.3	–21.2	26.3	11.6
39	Other manufacturing industries	10.3	–10.2	4.8	9.2
	Non-Oil and Gas Manufacturing	10.5	–6.3	7.4	6.2

Source: CEIC Database.

inelastic demand for food staples and the fact that some of the export-oriented food processing activities benefited from the exchange rate decline. Textiles, clothing and footwear (TCF, ISIC 32) grew more slowly than the industry average, but declined less sharply during the crisis. The slower export growth of these labour-intensive activities in the wake of the exchange rate decline is an issue to which we return below. The resource-based sectors, wood products (ISIC 33) and paper products (ISIC 34), have grown slowly after the crisis, again in spite of the boost to competitiveness. In both cases, notwithstanding higher international prices, the problems are on the supply-side, as access to reliable natural resource supplies has become a serious constraint. After the crisis, corruption and mismanagement of the country's timber resources have become even more serious problems (see Resosudarmo, 2005). Moreover, the removal of the prohibition on log exports significantly increased input costs for firms in these sectors.

Among the mineral-resource based activities, chemicals and related products (ISIC 35) experienced only a mild decline during the crisis. This was partly due to the close connection with the resilient agriculture sector for major sub-sectors such as the fertilizer industry. By contrast, non-metallic mineral products (ISIC 36) contracted sharply, reflecting the collapse of the construction industry in 1997–1999. Basic metals (ISIC 37) and machinery and equipment products (ISIC 38) also contracted sharply. The former is dominated by inefficient state enterprises selling most of their output to firms in the latter sector. ISIC 38 is dominated by two industries, automotive products and electronics. The auto industry has a history of high levels of protection and was thus dependent on the domestic market up to the crisis. As demand collapsed in 1997–1998, the industry came to a stand still. Electronics weathered the crisis more effectively, primarily owing to its export-oriented components assembly activities. However, these exports remain small in aggregate (see below), with thin domestic value added. Output then recovered strongly after 2000. Protection for the auto industry was reduced quickly as part of the government's agreement with the IMF, and the resulting rationalisation, combined with some technological learning during the period of high protection, forced firms towards more economic production runs and an increased focus on exports (Aswicahyono et al., 2000).

What are the general correlates of industry growth and survival during the crisis, as indicated by the Indonesian experience? Narjoko (2006) provides a detailed analysis through to 2000. Three correlates stand out. First, those industries (and firms) that have high levels of foreign ownership were generally able to navigate the crisis. Their foreign partners had deeper pockets, stronger connections to international financial markets and, with superior knowledge of export markets, they were able to take advantage of the major boost to competitiveness following the exchange rate depreciation. Second, industries in which Indonesia has a comparative advantage – that is, labour and some resource-intensive activities – and where there were established exporters, also benefited from the more competitive exchange rate. Third, industries producing ‘essentials’, mainly food products, were less adversely affected by the crisis. Some of these activities are also export-oriented and therefore benefitted in addition from the depreciation.

Ownership Patterns

Ownership patterns are typically quite stable in the short run, though a deep economic crisis may generate major changes. Here too the literature provides limited guidance. For example, foreign ownership may rise in response to attractive buying opportunities and a (forced) more liberal FDI regime (Lipsey, 2001). However, it could also fall as foreign capital is deterred by a collapsing economy and an uncertain political outlook. Similarly, producer concentration could either rise or fall, depending on which firm size segments are most adversely affected by the crisis.

The Indonesian evidence points to rising foreign ownership but little change in concentration over the period 1990–2005 (Table 3). The share of manufacturing output produced by firms with foreign equity rose from 22 per cent in 1990 to 37 per cent in 2005. It rose more or less continuously throughout the period, but particularly immediately before and after the crisis, 1993–1999. Thus the crisis had no major impact on this secular trend of rising foreign ownership. This outcome also serves as a caution about drawing strong inferences from FDI trends generated from the balance of payments statistics, since the latter typically understate FDI through M&A activity funded from domestic sources, such as retained earnings and local borrowings. The increase in foreign ownership is evident in most industries, except for paper and chemical products, where local firms have become more active. As expected, the foreign presence is greatest in the two most multinational enterprise (MNE)-intensive industries, automotive products and electronics. There has been very little change in concentration, as measured by the share of the four largest firms in each industry's output. These ratios are generally high, with figures of at least 60 in more than half the industry groups. Such levels are typical for developing economies at a relatively early stage of industrialisation.

Indifferent Export Performance

As Indonesia liberalised in the 1980s, it became a more trade-exposed economy. From 1979/80 to 2005/06, its share of global non-oil exports almost doubled, from 0.5 per cent to 0.9 per cent, at about the rate for Southeast Asia as a whole (3% to 6.9%).⁶ In the immediate post-crisis period, exports responded significantly to the

Table 3. Concentration and foreign ownership by sector, 1990–2005

		1990	1993	1996	1999	2002	2005
Concentration (CR4)							
31	Food, beverages, and tobacco	59	69	59	57	56	60
32	Textile, clothes and leather industry	29	32	28	29	30	42
33	Wood and wood products	22	24	26	25	29	33
34	Paper and paper products	61	57	61	70	73	64
35	Chemicals and chemical products	58	58	57	63	59	56
36	Non metallic mineral products	61	59	59	63	66	66
37	Basic metal industries	80	73	79	79	74	66
38	Fabricated metal, machinery, and equip.	74	75	74	67	69	71
39	Other manufacturing industries	61	66	61	62	73	79
1-ULI	Unskilled Labour Intensive	30	33	29	30	32	43
2-RLI	Resource Based, Labour Intensive	48	57	51	50	51	57
3-RCI	Resource Based, Capital Intensive	65	62	64	67	66	61
4-ELE	Electronics	74	68	68	57	55	67
5-FCI	Footloose Capital Intensive	73	78	78	75	72	72
	Non-Oil and Gas Manufacturing	54	56	56	54	57	58
Foreign ownership (share, in %)							
31	Food, beverages, and tobacco	8.5	9.7	14.0	15.8	9.4	24.9
32	Textile, clothes and leather industry	17.8	21.8	29.3	37.4	32.1	32.8
33	Wood and wood products	10.1	11.7	22.9	15.8	11.6	11.2
34	Paper and paper products	30.2	14.9	33.8	23.5	46.4	29.0
35	Chemicals and chemical products	33.1	36.6	43.0	44.8	29.7	26.3
36	Non metallic mineral products	18.0	23.3	33.4	34.6	28.3	35.9
37	Basic metal industries	24.8	35.3	24.3	43.1	29.4	30.5
38	Fabricated metal, machinery, and equip.	46.1	36.4	42.4	58.0	67.6	68.3
39	Other manufacturing industries	19.5	44.4	51.9	56.1	33.7	46.9
1-ULI	Unskilled Labour Intensive	16.2	21.1	27.3	35.4	28.8	30.0
2-RLI	Resource Based, Labour Intensive	9.0	10.2	16.8	15.9	9.8	22.8
3-RCI	Resource Based, Capital Intensive	29.5	32.5	35.9	40.0	34.9	29.9
4-ELE	Electronics	41.7	43.0	48.7	82.4	71.5	68.9
5-FCI	Footloose Capital Intensive	47.2	34.7	39.5	44.0	66.0	68.1
	Non-Oil and Gas Manufacturing	21.9	23.4	30.9	35.5	33.5	37.2

Source: Statistik Industri (SI), various years.

exchange rate depreciation, with a lag. However, in spite of buoyant commodity prices in the early years of the twenty-first century, export growth since 1998 has been sluggish, compared to both neighbouring East Asian economies and the country's pre-crisis record. These data refer to growth and shares in nominal dollar exports. For manufactures, they therefore obviously understate the growth in domestic currency terms, and also in volumes.⁷ For total exports, by contrast, the nominal price data overstate the volume growth from 2001, since the growth rates are inflated by increased international prices for commodities (Athukorala, 2006). Thus the overall picture for manufactured exports is a clear 'bounce' in the wake of the sharp exchange rate depreciation in 1997–1998, followed by a trend growth rate that is substantially lower than the decade after the mid 1980s reforms.

We classify manufactured exports into five main categories, broadly corresponding to factor intensity groupings (Table 4). These are unskilled labour intensive,

Table 4. Export growth by sector (% per annum, based on nominal USD), 1990–2006

		1990– 1993	1994– 1996	1997– 1999	2000– 2002	2003– 2006
1-ULI	Unskilled Labour Intensive	37.7	6.0	–0.8	0.5	7.9
821	Furniture and parts thereof	44.7	12.1	10.1	7.6	5.6
651	Textile yarn	41.7	35.3	9.7	1.8	10.1
851	Footwear	74.2	9.5	–9.3	–9.5	8.0
843	Womens, girls, infants outerwear, textile, not knitted or crocheted	35.4	–0.8	3.0	4.2	6.8
845	Outerwear knitted or crocheted, not elastic nor rubberised	21.8	–1.6	2.4	3.9	16.8
2-RB-LI	Resource Based Labor Intensive	19.9	–1.7	–9.7	–4.6	0.9
634	Veneers, plywood, ‘improved’ wood and other wood, worked, nes	17.9	–4.4	–12.3	–6.9	–0.9
635	Wood manufactures, nes	53.6	16.8	–2.5	0.7	4.8
663	Mineral manufactures, nes	53.4	18.5	35.5	8.2	5.8
662	Clay and refractory construction materials	74.6	5.6	117.8	10.8	7.8
667	Pearl, precious and semi-precious stones, unworked or worked	27.0	–5.5	19.3	–8.4	32.0
3-RB-CI	Resource Based Capital Intensive	8.4	19.0	18.8	4.6	15.6
641	Paper and paperboard	34.1	22.3	38.2	–2.9	18.9
625	Rubber tires, tire cases, inner and flaps, for wheels of all kinds	10.5	45.7	0.9	12.1	23.0
674	Universals, plates, and sheets, of iron or steel	–2.8	38.1	1.6	0.4	61.3
511	Hydrocarbons, nes, and derivatives	205.8	39.8	55.2	31.8	36.6
522	Inorganic chemical elements, oxides and halogen salts	3.0	44.2	–9.3	37.2	34.2
4-ELE	Electronics	93.5	36.9	0.6	37.9	4.7
752	Automatic data processing machines and units thereof	1,875.6	78.0	–10.2	182.9	16.6
778	Electrical machinery and apparatus, nes	46.6	27.6	3.1	8.7	18.8
764	Telecommunication equipment, nes; parts and accessories, nes	81.0	46.2	2.4	29.8	2.5
763	Gramophones, dictating machines and other sound recorders	441.6	36.1	–15.6	49.8	–4.1
772	Electrical apparatus for making and breaking electrical circuits	702.3	27.6	0.1	107.4	14.6
5-FLCI	Footloose Capital Intensive	42.7	22.1	10.7	8.7	20.0
784	Motor vehicle parts and accessories, nes	50.5	35.9	46.0	27.4	32.6
582	Condensation, polycondensation and polyaddition products	23.7	115.8	18.6	13.2	14.2
583	Polymerization and copolymerization products	29.2	44.1	23.0	1.9	16.9
513	Carboxylic acids, and their derivatives	16.6	64.8	37.8	10.7	13.1
512	Alcohols, phenols etc, and their derivatives	48.3	56.4	9.9	6.2	19.7
	Manufacturing Exports	29.5	9.6	0.8	9.9	7.9

Source: UN Comtrade database.

resource-based (labour and capital intensive), footloose capital intensive, and electronics. The latter is a separate category owing to its size and the ambiguity of its factor proportions.⁸ In each case, the four largest exports at a disaggregated SITC (standard international trade classification) level are identified. There are significant differences in performance across these major product groups, and these reflect the interplay of external and domestic policy factors. The two labour-intensive product groups have performed very poorly. The resource-based group, mainly wood products, shrank for most of the period, reflecting mainly supply mismanagement. For the footloose group, export growth was also slowing before the crisis, but there was no recovery in response to the large exchange rate depreciation. The declining growth rates were evident in both quota-constrained products (for example, most garments) and products for which quotas do not apply (such as footwear). Thus the outcome points to a general competitiveness problem.

Indonesian electronics exports have grown erratically, from a very small base in the early 1990s, and broadly following the global electronics cycle since 2000. There was some interruption to supply during the crisis, as MNE export/import operations were disrupted, and some foreign investors avoided the country owing to political instability. In any case, Indonesia is a minor player in this, the fastest growing non-resource-based sector of international trade until the current global financial crisis, owing to the country's inability to adapt to the industry's specific operational requirements, particularly efficient cross-border logistics, infrastructure, and a predictably open FDI environment (Athukorala, 2006; Kimura, 2006). As a result, Indonesia's share of global parts and components exports (defined as SITC 75–77), the best proxy indicator for participation in these global factory networks, was just 0.6 per cent in 2005/06, compared to the Southeast Asian and East Asian shares of 10.5 per cent and 39.7 per cent respectively.

Paradoxically, Indonesia's export performance after the crisis has been strongest where it was least expected, in the capital-intensive sectors. Both the resource-based and footloose segments have performed quite well. In the case of the former, high commodity prices are the primary explanation, and these have been sufficient to overcome the increased commercial risk of operating in this sector. Among the footloose products, there has been a remarkably rapid adjustment in the automotive industry. Historically, it has been the most heavily protected of Indonesia's major manufacturing sectors. Yet, when protection was reduced during the crisis, the major auto firms were able to rationalise their production quite quickly, dropping uneconomic production lines, concentrating on products in which they were already quite competitive (for example, utility vehicles) and auto parts, and (among those with foreign equity participation) shifting increasingly to exports (see Aswicahyono et al., 2000). Petrochemicals and related products have also performed well.

Wages and 'Jobless Growth'

The crisis and associated policy responses appear to have had a fundamental effect on labour market outcomes. As noted, initially Indonesia's flexible labour market resulted in most of the sharp decline in output translating into the labour market via price rather than quantity effects, that is through falling real wages rather than increased unemployment. From 1999, the labour market regulatory environment

became much less employment friendly, and hence the economic recovery since then has had limited impact on employment, at least in the formal manufacturing sector.

The impact of the labour regulatory regime can also be seen in the trends in unit labour costs (ULCs). These are defined as total compensation per unit of output.

That is:

$$ULC = \frac{\text{Total labour costs}}{\text{Total real output}} = \frac{w.L}{VA} = \frac{\text{Nominal wage per unit of labour}}{\text{Labour productivity}} = \frac{w}{VA/L}$$

Taking the logarithm of both sides, and expressing the above equation in growth terms, we have:

$$\widehat{ULC} = \widehat{w} - \left(\frac{\widehat{VA}}{\widehat{L}} \right)$$

Thus, changes in unit labour costs reflect the net effect of changes in nominal wages and changes in labour productivity. ULCs rise when nominal wages rise faster than labour productivity. To understand this, recall that labour productivity can be measured as the quantity of output produced for a given labour input. If labour productivity increases and nominal wages remain unchanged, then unit labour costs would decline, *ceteris paribus*. Conversely, if labour productivity remains unchanged but nominal wages rise, then unit labour costs would rise. ULCs are useful as an indicator of competitiveness, both economy-wide and at a sector level, as a supplement to the real effective exchange rate.

Table 5 shows ULCs for Indonesian manufacturing by sector and factor intensity groupings for the period 1991–2005. The general picture is one of continuous increase. Prior to the crisis, ULCs were growing quite strongly, for the period 1991–1996 by more than 6 per cent per annum, broadly similar to the increase in real value added per worker. However, they rose very sharply during the crisis period, 1997–1999. This was primarily the result of rising nominal wages (though sharply falling real wages), combined with declining labour productivity, the latter principally the result of sharply declining capacity utilisation rates as domestic demand collapsed. Since the crisis, ULCs have continued to increase, albeit at a slower rate, similar to that of the pre-crisis period. By 2005, ULCs on average were about 3.5 times that of 1990. Thus there has been a sharp increase in ULCs, indicating that nominal wages have increased much faster than productivity growth, with the result that Indonesia has lost some of its labour cost competitiveness.⁹

Figure 1 documents labour market outcomes, with reference to manufacturing sector employment-output elasticities since 1990. The results clearly show that manufacturing employment was highly output responsive over the period 1990–1996. Since 1998, however, there has been virtually no manufacturing employment growth, despite output growing at an average of 5.5 per cent.¹⁰ This outcome reflects both the general effects of slow employment growth in aggregate and the specific effects on major labour-intensive activities such as TCF. Since it has persisted for several years after the recovery, beyond the period when any ‘labour hoarding’ effects would have been felt, the primary explanation for the outcome has to be the

Table 5. Unit labour costs (ULCs) in manufacturing, 1993–2005

		1991– 1993	1994– 1996	1997– 1999	2000– 2002	2003– 2006
Annual Growth						
31	Food, beverages, and tobacco	12.8	8.1	19.3	17.5	6.4
32	Textile, clothes and leather industry	2.4	5.8	21.5	18.4	2.2
33	Wood and wood products	10.8	6.9	28.9	6.2	12.0
34	Paper and paper products	14.0	6.7	15.4	5.5	25.5
35	Chemicals and chemical products	13.9	2.7	24.4	7.9	21.4
36	Non metallic mineral products	12.4	10.2	21.0	0.1	6.3
37	Basic metal industries	22.0	–15.5	143.2	18.1	36.6
38	Fabricated metal, machinery, and equip.	16.1	–3.8	33.6	10.8	–2.2
39	Other manufacturing industries	6.6	6.1	24.4	30.5	–22.2
1-ULI	Unskilled Labour Intensive	1.1	5.5	21.8	18.1	1.0
2-RLI	Resource Based, Labour Intensive	11.2	7.3	22.0	12.2	5.9
3-RCI	Resource Based, Capital Intensive	16.0	–1.5	34.4	4.7	20.4
4-ELE	Electronics	14.6	–7.2	45.4	8.1	–4.1
5-FCI	Footloose Capital Intensive	19.0	–1.0	30.2	20.4	2.7
	Manufacturing	10.4	2.3	26.1	8.2	4.6
Index						
31	Food, beverages, and tobacco	100.0	181.0	303.5	484.8	2.7
32	Textile, clothes and leather industry	100.0	114.4	202.7	343.1	3.0
33	Wood and wood products	100.0	160.4	315.2	507.3	3.2
34	Paper and paper products	100.0	176.5	162.4	330.8	1.9
35	Chemicals and chemical products	100.0	148.1	251.8	318.4	2.1
36	Non metallic mineral products	100.0	180.4	316.0	296.8	1.6
37	Basic metal industries	100.0	91.0	673.9	1646.7	18.1
38	Fabricated metal, machinery, and equip.	100.0	104.3	247.7	188.8	1.8
39	Other manufacturing industries	100.0	109.6	209.5	189.7	1.7
1-ULI	Unskilled Labour Intensive	100.0	114.3	205.9	332.9	2.9
2-RLI	Resource Based, Labour Intensive	100.0	169.1	296.2	445.5	2.6
3-RCI	Resource Based, Capital Intensive	100.0	143.4	297.8	410.2	2.9
4-ELE	Electronics	100.0	90.4	267.8	234.7	2.6
5-FCI	Footloose Capital Intensive	100.0	109.8	227.2	172.1	1.6
	Manufacturing	100.0	141.9	278.5	357.3	2.5

Source: Statistik Industri (SI), various years.

labour policy regime. In interpreting the results, recall that the industrial survey data refer only to firms with at least 20 employees. It is possible, indeed likely, that some of the employment growth hitherto occurring in the ‘formal’ sector has been pushed into the less regulated (and poorly paid) informal sector of manufacturing. Employment trends in the latter are not well documented, and so this possibility remains a hypothesis pending better data.

Slowing Firm Dynamics (I)

A feature of rapid industrialisation and well functioning product and factor markets is high levels of firm mobility across size groups. In our earlier study of Indonesian

Figure 1. Manufacturing employment–output elasticities, 1990–2005.

Source: Statistik Industri (SI), various years.

industrialisation (Aswicahyono et al., 1996), there was considerable evidence of this mobility, in particular of firms ‘graduating’ to larger size groups. We were able to examine this phenomenon through very detailed firm-level analysis, made possible by the fact that each firm in the annual survey is identified by a consistently designated code that enables it to be traced over time. One of the results of this earlier analysis was to demonstrate that the widely discussed phenomenon that the share of small firms in industrial output was apparently declining could actually be interpreted positively, not as a sign that these firms were being pushed out in the process of the rapid industrialisation – the commonly held perception at the time – but rather that they were vacating the smaller size groups and graduating to larger groupings. This result was shown by comparing the share of total output by firm size at the ‘current year’, the basis for the gloomy conclusion, and the ‘initial year’, the basis for the positive interpretation.

In this paper, we repeat the exercise through to the year 2005. That is, we trace through each firm over the period 1990–2005, and assign it to a firm size grouping. These are chosen arbitrarily but plausibly as firms with 20–99 workers, 100–499 workers and more than 500 workers.¹¹ We then estimated output (and employment, though not shown here) by the three size groups, based on each firm’s size in the current year and the initial year, with the latter being either 1990 or the year the firm commenced operation. The results are presented in Table 6. There is little change in the size share based on current size, with the share of small firms rising slightly pre-crisis, then falling somewhat, while the largest firms were most affected by the economic crisis. However, based on size in the initial year, the small firm share rose quite quickly through to the crisis, but then began to decline from 2001.

Table 6. Manufacturing output by size group, 1990–2005

	Small L = 20–99	Medium L = 100–499	Large L = 500+
Current size (% value added)			
1990	7	27	66
1991	6	28	66
1992	7	28	64
1993	7	23	70
1994	7	23	70
1995	7	22	71
1996	7	21	73
1997	8	27	65
1998	8	24	68
1999	7	25	68
2000	7	24	68
2001	9	24	68
2002	7	24	69
2003	6	23	70
2004	6	25	69
2005	5	25	70
Initial size (% value added)			
1990	7	27	66
1991	7	28	65
1992	10	31	59
1993	10	31	58
1994	11	29	60
1995	13	29	59
1996	12	31	57
1997	14	38	48
1998	14	32	54
1999	12	33	54
2000	13	31	56
2001	15	31	54
2002	13	31	56
2003	13	31	56
2004	13	32	55
2005	12	33	55

Source: Statistik Industri (SI), various years.

Thus the crisis and its immediate aftermath appear to have marked a turning point in this process of firm mobility. Until the crisis, smaller firms continued to display the dynamism evident in the pre-crisis period. However, after the crisis, the pace of graduation slowed, and the small firm share in both series declined. These results are not necessarily cause for concern, as they could simply reflect a longer term process of industrial consolidation. They may also reflect the effects of the crisis, from which smaller firms experienced greater adjustment difficulties, or the increased competitive pressures that occurred as firms sought to survive.

There are no general data to support the latter proposition. But there is presumptive evidence to advance the hypothesis that the barriers for smaller firms increasing their scale have risen since the crisis, particularly in access to finance.

This arises due to the credit rationing devices that are commonly put in place after crises and that invariably support larger firms with better collateral and credit histories (Stiglitz and Weiss, 1981). The underlying argument is that banks have more difficulty differentiating between 'good' and 'bad' loan applicants after the crisis and, as a result, banks are more likely to adopt more stringent lending policies, favouring those who were able to provide more collateral and/or an established credit history. There is some evidence from East Asia in the late 1990s supporting this view. As Gosh and Gosh (1999) and Ding et al. (1998) argued, not only was there credit rationing during the crisis, but SME firms were more adversely affected than larger ones.

Indonesia's banking sector was the most severely affected among the East Asian crisis economies, resulting in a significant re-nationalisation of banks and reform of the regulatory regime. However, as Rosengard et al. (2007) note, these reforms have had the unintended consequence of limiting the access of small enterprises to formal sector financial institutions. Based on the questionable premise that larger financial institutions are less likely to fail than smaller ones, the country's small, community-based institutions have been instructed to merge with larger, centralised units, and among the latter '...innovative microfinance services were viewed with suspicion and hostility' (p. 87).

Transition matrices of the size distribution of firms support the conclusion that the speed of firm mobility slowed after the crisis. These matrices are computed for the pre- and post-crisis periods, defined here as 1992–1996 and 2001–2004 (Table 7). They show the distribution of firms for the same three size groups according to the initial and final year of each sub-period. Thus, of the small firms in 1992, by 1996 90.6 per cent were still small, while 8.8 per cent and 0.6 per cent had graduated to the medium and large groups respectively. A clear result over the two sub-periods is that there is less mobility: more small firms remained small

Table 7. Transition matrices

		1996		
		S = 20–99	M = 100–499	L = 500+
a. Distribution of plants (% total plants), 1992 and 1996				
1992	S = 20–99	90.6	8.9	0.6
	M = 100–499	13.1	75.4	11.5
	L = 500+	1.9	13.1	85.1
		2004		
		S = 20–99	M = 100–499	L = 500+
b. Distribution of plants (% total plants), 2001 and 2004				
2001	S = 20–99	96.1	3.7	0.1
	M = 100–499	10.9	84.3	4.8
	L = 500+	0.9	11.8	87.3

Source: Statistik Industri (SI), 1992, 1996, 2001, and 2004.

after the crisis as compared to before it. A similar conclusion holds for the medium-sized firms.

Slowing Firm Dynamics (II)

This sub-section extends the analysis of firm-level dynamics by examining two additional aspects: the patterns of firm-level entry and exit, and the rates of expansion and contraction for 'surviving' firms. Here too we undertake this analysis by tracking the history of each firm enumerated in the survey. An earlier study by Narjoko (2006) examined these patterns in the pre-crisis and crisis periods. This analysis extends the examination through to 2004, by which time manufacturing output had returned to pre-crisis levels and was growing moderately strongly. Specifically, we examine two interrelated phenomena: the entry and exit rates of firms over time and, among the survivors, expansion and contraction rates.

First, with respect to entry and exit rates, the analysis can be conducted with reference to number of plants, employment or value added. The story is broadly similar, and so we present results only for the rates by number of firms. (The additional data for other variables are available from the authors on request.) The following definitions are used for entry and exit rates, for industry j and time periods t and $t-1$:

$$\text{Entry rate}_{j,t} = \frac{NEP_{j,t}}{NTP_{j,t-1}}$$

$$\text{Exit rate}_{j,t} = \frac{NXP_{j,t}}{NTP_{j,t-1}},$$

Where:

$NEP_{j,t}$ = total number of plants that enter industry j between t and $t-1$,

$NXP_{j,t}$ = total number of plants that exit industry j between t and $t-1$,

$NTP_{j,t-1}$ = total number of plants in industry j in $t-1$.

We identify four separate sub-periods, pre-crisis (1993–1996), crisis (1996–1999), early post-crisis (1999–2002), and return to growth (2002–2004). Before the crisis, as would be expected, there were high plant entry rates, and these were almost double the exit rates (Figure 2). Note also, however, and consistent with industrial dynamism, that the exit rates were not insignificant. As the crisis hit, entry rates fell, to approximately half the pre-crisis figure, while exit rates rose, and began to exceed entry rates. These trends applied to practically all industry groups, but especially to TCF, wood products, and non-metallic minerals (respectively ISIC 32, 33, 36). They also apply to most firm and ownership groups, though with considerable variations (see Narjoko (2006) and for a summary Narjoko and Hill (2007)).

While this response is as would be expected, some trends are puzzling. In particular, the immediate crisis response of exit rates exceeding entry rates has

persisted through to 2004, by which time positive economic growth had resumed for four years. Moreover, entry rates have continued to decline, in contrast to what might have been the expected outcome of a sharp decline during the crisis and recovery thereafter. At least two possible conjectures are plausible here. One is that there is a delayed response of firms: the initial adjustment is to reduce output, switch output composition, extend credit lines, live off past capital and so on, in the hope that firms can trade through the difficulties. Especially for well-established firms, such strategies can endure for several years. Hence, the exit rates are spread out over several years, as illustrated in Figure 2, rather than a single large reduction in the crisis period. The second conjecture relates to the extended decline in entry rates, for five years after the crisis. Here the likely explanation is that potential new entrants were holding back, observing the continuing exit process, in addition to the fact that there were high levels of excess capacity following the crisis. The difficulties in accessing finance and rising competitive pressures, as noted above, have arguably resulted in increased barriers to entry.

The entry and exit rates across major industry groups are not presented here, but they are broadly consistent with major output trends. In particular, there are higher exit rates for plants in the major labour-intensive sectors identified above, ISIC 32, 33, and 36. This confirms the results above, and highlights the paradox that, just when Indonesia's labour-intensive exports would have been expected to grow strongly, the opposite happened, principally owing to a less supportive domestic policy environment.

Figure 2. Entry and exit rates in manufacturing (% , based on the number of plants), 1993–2004.

Source: Statistik Industri (SI), various years.

What happened to firms that survived the crisis? We follow the usual definitions of expansion and contraction rates (see for example Davis et al., 1996), with reference to employment in industry j and time period t :

$$\text{Expansion rate}_{j,t} = \frac{EMPL_POS_{j,t}}{EMPL_T_{j,t-1}}$$

$$\text{Contraction rate}_{j,t} = \frac{|EMPL_NEG_{j,t}|}{EMPL_T_{j,t-1}}$$

Where:

$EMPL_POS_{j,t}$ = total employment of plants that expanded between t and $t-1$,
 $EMPL_NEG_{j,t}$ = total employment for plants that contracted between t and $t-1$,
 $EMPL_T_{j,t}$ = total employment in year t .

Here too, as would be expected, expansion rates exceeded contraction rates prior to the crisis (Figure 3). During the crisis, expansion rates declined but contraction rates increased, and the two rates converged. Thereafter, the pre-crisis pattern of expansion exceeding contraction resumed, although the gap between the two narrowed, that is, the net expansion rate was lower. There are also differences among major industry groups, with a similar division as for the entry and exit rates. In particular, growth has originated more from the expansion of existing plants than

Figure 3. Expansion and contraction rates in manufacturing (% , based on employment), 1993–2004.

Source: Statistik Industri (SI), various years.

the entry of new ones in the resource-based and capital-intensive industries, such as food products and processing, paper products, chemicals, and machinery and equipment (respectively ISIC 31, 34, 35, 38).

The picture for firm dynamics can be summarised by decomposing employment growth into that due to entry/exit on the one hand and expansion/contraction on the other. We conduct the analysis with reference to employment effects rather than plants, and thus the terms are referred to as 'Entry rate 2' and 'Exit rate 2' to differentiate them from those above. That is:

$$\text{Entry rate } 2_{j,t} = \frac{EMPL_EN_{j,t}}{EMPL_T_{j,t-1}}$$

$$\text{Exit rate } 2_{j,t} = \frac{EMPL_EX_{j,t}}{EMPL_T_{j,t-1}}$$

Where:

$EMPL_EN_{j,t}$ = total employment of plants that entered industry j between t and $t-1$,
 $EMPL_EX_{j,t}$ = total employment of plants that exited industry j between t and $t-1$.
 So, Employment growth decomposition $_{j,t}$ = Entry rate $2_{j,t}$ + Expansion rate $_{j,t}$ + Exit rate $2_{j,t}$ + Contraction rate $_{j,t}$

Figure 4 presents the results of the decomposition. The results show that, since the crisis, expansion has become more important than entry for employment over time. The inference is therefore that, in the wake of the crisis, most of the growth originated from what may be termed 'insiders', that is firms who were able to survive the crisis, and adapt more quickly to the significantly altered policy and commercial environment. As Narjoko (2006) demonstrates for the period through to 2000, specific firm attributes were commonly associated with these outcomes, in particular prior export orientation and foreign ownership. In addition, firms that maintained credit lines or had low debt generally survived and were able to respond more quickly to the economic recovery from 2000. Potential new entrants were apparently deterred by real or perceived barriers to entry, including the more unpredictable business and political environment, and a much more cautious financial sector.

IV. Summary and Implications

Our key findings may be summarised as follows. During and after the crisis, manufacturing output trends generally followed those of the economy as a whole, with the caveat that the former's growth declined from slightly above the economy-wide average to slightly below it. Manufactured export growth has been indifferent, though with considerable inter-industry variations. There have been no major changes in ownership patterns, apart from a continuation of rising foreign ownership; producer concentration remains high. Manufacturing employment growth has been very slow, verging on 'jobless growth'. There appears to be less firm-level mobility, with fewer firms increasing in size and most of the growth

Figure 4. Decomposition of employment growth (%), 1993–2004.

Note: Entry and exit rate in the figure are defined in terms of employment (i.e. Entry rate 2 and Exit rate 2, see text).

Source: Statistik Industri (SI), various years.

occurring from existing firms rather than newcomers. In both respects, these outcomes differ from those of the pre-crisis period.

What light do these findings shed on the four hypotheses articulated at the beginning of the paper?

First, the sharp exchange rate depreciation did not result in improved export performance. This was due to a number of factors in the *ceteris paribus* caveat, in particular the loss of macroeconomic control, which nullified the initial benefits of the nominal depreciation.

The indifferent export performance was also the result of the set of events anticipated in the fourth hypothesis, namely the intensified labour market regulations, that increased the cost of labour and deterred employers from hiring new workers. This particularly affected the performance of traditional labour-intensive activities, textiles, clothing and footwear, which drove Indonesia's first round of successful export-oriented industrialisation. Increased competition from other exporters played a role, although these exports were quota-constrained until 2005 when the Multi-Fibre Agreement was finally phased out.

We have also illustrated the operation of the second hypothesis that, although the financial sector is once again operational, it is less supportive of new entrants, start-up projects and risk-taking. This is perhaps to be expected after such a massive economic crisis, when several banks collapsed and complex corporate debt workouts took up to a decade to resolve. Large, capital-intensive projects require long-term financing, typically with a mix of domestic and international funding. SMEs require flexible funding, including a willingness to support sound business proposals rather

than simply evidence of bankable collateral. In both cases, the financial sector needs to be underpinned by a supportive legal system. For foreign financiers, this in turn requires legal protection, yet the evidence during the post-crisis workouts is that Indonesian courts have been generally predisposed to support debtors over creditors and domestic over foreign parties. SME expansion is typically funded through retained earnings and informal funding, but the development of more formal channels has been hindered by poorly defined land titling and property rights for other sources of collateral.

Outcomes in the financial sector also reflect the effects of the third hypothesis, related to increased institutional uncertainty. This is evident in a number of respects. One, noted above, is the operation of the legal system. A second is slower and more complex export/import procedures, as the customs service is less amenable to policy control. This factor, combined with a third element of uncertainty, the FDI regulatory regime, has also been a factor explaining the country's indifferent export performance in electronics products and components. An inability to maintain infrastructure investments at pre-crisis levels is an additional factor, and also an outcome of the increased commercial uncertainty, particularly for private investors.

The increased uncertainty has also resulted in Indonesia under-performing in resource-based activities, in which the country has a strong potential comparative advantage in resource-based activities. The long-term viability of these industries requires access to a predictable, well-managed and sustainable supply of raw material inputs. A key problem here is that the evolving post-crisis political and institutional architecture (on which see McLeod and MacIntyre, 2007) has not yet been able to deliver such an outcome. This is particularly the case for much of the mining industry and for forest-based products such as plywood, paper and pulp. The pre-crisis policy regime was highly centralised and corrupt, yet it did deliver predictability for the politically well-connected players. After the crisis, these centralised structures have broken down, with a weaker central government, and a decentralised policy environment comprising about 500 sub-national governments all seeking control over lucrative natural resource rents within their jurisdiction (Resosudarmo, 2005).

The preceding analysis examines the impact of the 1997–1998 crisis. Will the current global financial crisis (GFC) have similar effects to those identified in this paper from the earlier episode? The GFC is still unfolding, and we lack quick-release, firm-level data. But the answer is almost certainly no, as the two crisis events are different in almost every respect. In 1997–1998, as noted, there was a deep economic contraction, the domestic formal financial sector imploded, the exchange rate fell by over 70 per cent, and there was great political and institutional uncertainty culminating in regime collapse. However, the international economy remained buoyant. Thus, export-oriented firms, especially those with foreign equity, survived the crisis; some even prospered with the boost to competitiveness. However, domestic-market oriented firms contracted sharply, especially if they had unhedged foreign borrowings. In the current crisis, the domestic economy is holding up quite well, much better than the international economy, the financial sector is broadly intact, and there has been only a moderate exchange rate depreciation. Thus export-oriented firms have experienced the sharpest decline, while domestic market-oriented

firms, especially those producing goods with relatively inelastic demand, have been much less adversely affected.

Acknowledgements

For helpful comments on earlier drafts we thank the Editor and referees of this Journal; seminar participants at the Australian National University, the Fourth Australasian Development Economics Workshop (Canberra), the East Asian Economic Association Convention (Manila), and the Australia Indonesia Governance Research Project (AIGRP) conference (Jakarta). We also thank the AIGRP for financial support, and the Central Board of Statistics (BPS), Jakarta, for access to unpublished industrial survey data. Several tables and figures have been removed from the original version of the paper. These are available on request from the authors.

Notes

1. There has also been a shift in the formal exchange rate regime, from fixed but adjustable to a managed float, and resulting in greater exchange rate variability as compared to the pre-1997 period.
2. See Basri and Soesastro (2005) and Bird et al. (2008).
3. For example, Investment Board (BKPM) FDI approvals data show that, prior to the crisis, at least 60 per cent of FDI, and often much more, was greenfield in nature. Following the years of negative FDI, 1998–2003, FDI increasingly took the form of M&A and expansions, such that the greenfield share fell to 40 per cent for the years 2004–2007.
4. For general surveys of Indonesia's post-crisis business environment and its links to the changing political system, see Basri and van der Eng (2004) and McLeod and MacIntyre (2007).
5. A note here on our data sources is warranted. We use the national accounts series for the aggregate series, down to the two-digit ISIC classification. At higher levels of disaggregation, and for all firm-level data, we use the annual industrial surveys (Statistik Industri). The SI series is intended to enumerate all manufacturing units employing at least 20 workers, except for those in oil refining and gas processing. In practice, the SI survey is known to be incomplete, but the degree of under enumeration is modest and reasonably consistent, as indicated by the fact that the output growth rates of the two series are similar. For such a large sample of firms (over 20,000 annually), it is thought that the sampling error from this under enumeration is very small. Note also that the firm-level export statistics are incomplete (Takii and Ramstetter, 2005), and thus we have not utilised this potentially valuable data source.
6. Unless otherwise indicated, these comparative export data are sourced from Athukorala and Hill (2008), based on UN COMTRADE data.
7. There were also problems with the export data in 1999, which led to a probable over-statement of the total in that year. See Rosner (2000).
8. The five categories are based on the following ISIC groups (and corresponding SITC groups for export statistics). Unskilled labour-intensive: ISIC 32 (textiles and garments), 332 (furniture), 342 (printing and publishing), and 39 (other manufacturing). Resource based, labour-intensive: ISIC 31 (food and beverages) and 331 (wood products). Resource based, capital-intensive: ISIC 341 (paper and paper products), 35 (chemicals, rubber, and plastics), 36 (non-metallic minerals), and 37 (basic metals). Electronics: ISIC 383 (electrical machinery). Footloose capital-intensive: ISIC 381 (metal products), 382 (non-electrical machinery), 384 (transport equipment), and 385 (professional and scientific equipment). Note that electronics is typically classified as a high value added (R&D-intensive) activity. However, it is one of the few industries whose factor intensity *ranking* clearly shifts between low and high-income countries. In countries like Indonesia, electronics exports are dominated by labour-intensive assembly and packaging activities. (See Lall (2000) for further discussion of this issue.)
9. There have also been considerable inter-industry variations in ULCs. The greatest increases since 1996 have occurred in labour-intensive activities, notably TCF and wood products (ISIC 32 and 33), and are thus an important explanation of the poor export performance noted above.

10. It is possible that employment has actually declined, as illustrated by the figure for 2005, but we tend to discount this outcome since the 2005 survey appears to have systematically understated employment.
11. That is, approximately corresponding to small, medium and large firms respectively. Experimentation with different size groups revealed that the general conclusions are not sensitive to the definition of size groups.

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